Total Maximum Daily Load

Evaluation

for

Eighty-Seven Stream Segments

in the

Chattahoochee River Basin

for

Bacteria

Submitted to:
The U.S. Environmental Protection Agency
Region 4
Atlanta, Georgia

Submitted by:
The Georgia Department of Natural Resources
Environmental Protection Division
Atlanta, Georgia

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EXECUTIVE SUMMARY

The State of Georgia Environmental Protection Division (GA EPD) assesses its waterbodies for compliance with water quality criteria established for their designated uses as required by the Federal Clean Water Act (CWA). Assessed waterbodies are placed into one of three categories, supporting designated use, not supporting designated use, or assessment pending, depending on water quality assessment results. These waterbodies are found on Georgia's 2022 305(b) list as required by that section of the CWA that defines the assessment process and are published in *Water Quality in Georgia 2020-2021* (GA EPD, 2022). This document is available on the Georgia Environmental Protection Division (GA EPD) website.

The subset of the waterbodies that do not meet designated uses on the 305(b) list are also assigned to Georgia's 303(d) list, named after that section of the CWA. Although the 305(b) and 303(d) lists are two distinct requirements under the CWA, Georgia reports both lists in one combined format called the Integrated 305(b)/303(d) List, which is found in Appendix A of *Water Quality in Georgia 2020-2021* (GA EPD, 2022). Waterbodies on the 303(d) list are denoted as Category 5, and are required to have a Total Maximum Daily Load (TMDL) evaluation for the water quality constituent(s) in violation of the water quality standard(s).

The TMDL formulations in this document are based on impaired segments contained in the 2022 305(b)/303(d) List. The TMDL process establishes the allowable pollutant loadings or other quantifiable parameters for a waterbody based on the relationship between pollutant sources and instream water quality conditions. This allows water quality-based controls to be developed to reduce pollution and restore and maintain water quality.

Every waterbody in the State has one or more designated uses, and each designated use has water quality criteria established to protect it. Waterbodies in Georgia are assessed based on the 305(b/303(d) Listing Assessment Methodology included in Appendix A of *Water Quality in Georgia 2020-2021*, as such GA EPD has placed thirty (37) stream segments in the Chattahoochee River Basin on the 303(d) list of impaired waters because it was assessed as "not supporting" its designated use of "Drinking Water," "Recreation," and "Fishing," due to violation of the fecal coliform water quality criteria. This document also establishes revised TMDLs for fifty (50) stream segments in the Chattahoochee River Basin. Forty-seven (47) of these segments have the designated use of "Fishing", one has the designated uses of "Fishing" and "Recreation," and two segments have the designated uses of "Fishing" and "Drinking Water. A waterbody is assessed as "not supporting" its use if more than ten percent of the geometric means are greater than their seasonal waterbody specific criteria or if more than ten percent of the samples exceed the single sample criteria. The EPA approved water quality criteria in place when these streams were listed are as follows:

(a) Drinking Water Supplies: Those waters approved as a source for public drinking water systems permitted or to be permitted by the Environmental Protection Division. Waters classified for drinking water supplies will also support the fishing use and any other use requiring water of a lower quality.

(i) Bacteria: For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform not to exceed a geometric mean of 200 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 mL (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing freshwater streams. For the months of November through April, fecal coliform not to exceed a geometric mean of 1,000 per 100 mL based on at least four samples collected from a given

sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 mL for any sample. The State does not encourage swimming in surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of fecal coliform.

(b) : Recreation: General recreational activities such as water skiing, boating, and swimming, or for any other use requiring water of a lower quality, such as recreational fishing. These criteria are not to be interpreted as encouraging water contact sports in proximity to sewage or industrial waste discharges regardless of treatment requirements:

(i) Bacteria: Fecal coliform not to exceed the following geometric means based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours:

1. Coastal waters 100 per 100 mL
2. All other recreational waters 200 per 100 mL
3. Should water quality and sanitary studies show natural fecal coliform levels exceed 200/100 mL (geometric mean) occasionally in high quality recreational waters, then the allowable geometric mean fecal coliform level shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing fresh water streams.

(c) Fishing: Propagation of Fish, Shellfish, Game and Other Aquatic Life; primary contact recreation in and on the water for the months of May – October, secondary contact recreation in and on the water for the months of November – April; or for any other use requiring water of a lower quality.

(i) Bacteria: For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform not to exceed a geometric mean of 200 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 mL (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing freshwater streams. For the months of November through April, fecal coliform not to exceed a geometric mean of 1,000 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 mL for any sample. The State does not encourage swimming in surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of fecal coliform. For waters designated as shellfish growing areas by the Georgia DNR Coastal Resources Division, the requirements will be consistent with those established by the State and Federal agencies responsible for the National Shellfish Sanitation Program. The requirements are found in National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish, 2007 Revision (or most recent version), Interstate Shellfish Sanitation Conference, U.S. Food and Drug Administration.

In August 2015, the Georgia DNR Board adopted new bacteria criteria for “Recreation” uses using the bacterial indicators *E. coli* and enterococci. These bacteria are better indicators for human health illnesses. The adopted criteria have the same estimated illness rate (8 per 1000 swimmers) as the previously established fecal coliform criteria. EPA approved these revised criteria on August 16, 2016. In January 2022, the Georgia DNR Board adopted new bacteria criteria for “Fishing” and “Drinking Water” designated uses. EPA approved these proposed revisions to Georgia’s water quality standards on August 31, 2022. The bacteria water quality criteria for "Drinking Water”, “Recreation” and “Fishing” designated uses, as stated in the *State of Georgia’s Rules and Regulations for Water Quality Control*, Chapter 391-3-6-.03(6) (GA EPD, 2022), are as follows:

(a) Drinking Water Supplies: Those waters approved as a source for public drinking water systems permitted or to be permitted by the Environmental Protection Division. Waters classified for drinking water supplies will also support the fishing use and any other use requiring water of a lower quality.

(i) Bacteria:

1. For the months of May through October, when primary water contact recreation activities are expected to occur, culturable E. coli not to exceed a geometric mean of 126 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 410 counts per 100 mL in the same 30-day interval.

2. For the months of November through April, culturable E. coli not to exceed a geometric mean of 265 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 861 counts per 100 mL in the same 30-day interval.

3. The State does not encourage swimming in these surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of bacteria.

(b) Recreation: Primary contact recreational activities that occur year round such as swimming, diving, whitewater boating (class III and above), water skiing, and surfing, or for any other use requiring water of a lower quality, such as recreational fishing. These criteria are not to be interpreted as encouraging water contact sports in proximity to sewage or industrial waste discharges regardless of treatment requirements:

(i) Bacteria:

1. Coastal and estuarine waters: Culturable enterococci not to exceed a geometric mean of 35 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an enterococci statistical threshold value (STV) of 130 counts per 100 mL in the same 30-day interval.

2. All other recreational waters: Culturable E. coli not to exceed a geometric mean of 126 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 410 counts per 100 mL in the same 30-day interval

(c) Fishing: Propagation of Fish, Shellfish, Game and Other Aquatic Life; primary contact recreation in and on the water for the months of May – October, secondary contact recreation in and on the water for the months of November – April; or for any other use requiring water of a lower quality.

(i) Bacteria:

1. Estuarine waters: For the months of May through October, when primary water contact recreation activities are expected to occur, culturable enterococci not to exceed a geometric mean of 35 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an enterococci statistical threshold value (STV) of 130 counts per 100 mL the same 30-day interval.

   For the months of November through April, culturable enterococci not to exceed a geometric mean of 74 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an enterococci statistical threshold value (STV) of 273 counts per 100 mL in the same 30-day interval.

2. All other fishing waters: For the months of May through October, when primary water contact recreation activities are expected to occur, culturable E. coli not to exceed a geometric mean of 126 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 410 counts per 100 mL in the same 30-day interval.

For the months of November through April, culturable E. coli not to exceed a geometric mean of 265 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 861 counts per 100 mL in the same 30-day interval.

3. The State does not encourage swimming in these surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of bacteria.

4. For waters designated as shellfish growing areas by the Georgia DNR Coastal Resources Division, the requirements will be consistent with those established by the State and Federal agencies responsible for the National Shellfish Sanitation Program. The requirements are found in National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish, 2007 Revision (or most recent version), Interstate Shellfish Sanitation Conference, U.S. Food and Drug Administration.

Since this TMDL was written after EPA approved the new bacteria criteria, the TMDL will use both fecal coliform and the appropriate indicator identified above based on estuarine/non-estuarine status. Where fecal coliform and *E. coli* were sampled concurrently, the *E. coli* current load can be determined, and the percentage reduction calculated. For impaired waters where only fecal coliform was sampled, the current *E. coli* or enterococci load cannot be determined. In this case the TMDL will use a conversion factor to convert from fecal coliform criteria to *E. coli* or enterococci criteria*,* based on the respective 30-day geometric mean water quality criteria. For non-estuarine waters, a conversion factor of 0.63 will be used to translate the fecal coliform TMDL to *E. coli*. For estuarine waters, a conversion factor of 0.175 will be used to translate the fecal coliform TMDL to enterococci.

A waterbody is assessed as “not supporting” its use if more than ten percent of the geometric means are greater than their seasonal criteria or if more than ten percent of the samples exceeded the STV water quality criteria cited above. An important part of the TMDL analysis is the identification of potential source categories. Sources are broadly classified as either point or nonpoint sources. A point source is defined as a discernable, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters. Nonpoint sources are diffuse, and generally, but not always, involve accumulated fecal coliform bacteria that wash off land surfaces following storm events.

The process of developing fecal coliform bacteria TMDLs for listed segments in the Chattahoochee River Basin involved the determination of the following:

- The current critical bacterial load to the stream under existing conditions;
- The TMDL for similar conditions under which the current critical load was determined; and
- The percent reduction in the current critical bacterial load necessary to achieve the TMDL.

The calculation of the bacterial load at any point in a stream requires the bacterial concentration and stream flow. The availability of water quality and flow data varies considerably among the listed segments. The Loading Curve Approach was used to determine the current fecal coliform load and TMDL. The bacterial loads and required reductions for each of the listed segments are summarized in Table 1 below.

This document also includes revised TMDLs for stream segments that had TMDLs developed by USEPA using the BASINS watershed modeling approach. In the mid-2000s, GA EPD revised a

majority of fecal coliform TMDLs that had been developed using BASINS. The revised TMDLs are being included to ensure that all previously issued fecal coliform TMDL calculations use the Loading Curve Approach and include WLAs and TMDLs for the new bacterial indicators. The bacterial loads for each revised segment are summarized in Table 1 below.

Point and nonpoint source management practices should be used to help reduce bacteria source loads. The amount of bacteria delivered to a stream is difficult to determine. However, the use of management practices should improve stream water quality, and future monitoring will provide a measurement of TMDL implementation.

Table 1: Bacterial Loads and Required Bacterial Load Reductions

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300020304	Anneewakee Creek	Lake Monroe to Chattahoochee River	Fecal coliform	4.79E+11	2.34E+07	1.47E+11	1.97E+11	3.83E+10	3.83E+11	20.10%
			E. coli	[3]	1.48E+07	9.26E+10	1.24E+11	2.41E+10	2.41E+11	Undetermined [2]
GAR031300020605	Brush Creek	Tributary to West Point Lake	Fecal coliform	3.42E+11			1.34E+11	1.49E+10	1.49E+11	56.5%
			E. coli	[3]			8.44E+10	9.38E+09	9.38E+10	Undetermined [2]
GAR031300010913	Chattahoochee River	Dicks Creek to Johns Creek	Fecal coliform	1.71E+16	1.81E+10	2.25E+14	4.58E+14	7.58E+13	7.58E+14	95.6%
			E. coli	[3]	5.99E+10	2.30E+13	4.69E+13	7.77E+12	7.77E+13	Undetermined [2]
GAR031300040502	Coheelee Creek	Chancy Mill Creek to Chattahoochee River	Fecal coliform	4.60E+11			5.40E+10	6.00E+09	6.00E+10	87.0%
			E. coli	[3]			3.40E+10	3.78E+09	3.78E+10	Undetermined [2]
GAR031300030107	Cooper Creek	Headwaters to Bull Creek - Columbus	Fecal coliform	6.94E+11		4.76E+10	3.24E+10	8.90E+09	8.90E+10	87.2%
			E. coli	[3]		3.00E+10	2.04E+10	5.61E+09	5.61E+10	Undetermined [2]
GAR031300021010	Crawford Creek	Headwaters to Sulphur Creek	Fecal coliform	2.62E+11			1.40E+11	1.56E+10	1.56E+11	40.7%
			E. coli	[3]			8.82E+10	9.80E+09	9.80E+10	Undetermined [2]
GAR031300020422	Deer Creek	Headwaters to Centralhatchee Creek	Fecal coliform	3.66E+11			7.60E+10	8.45E+09	8.45E+10	77.0%
			E. coli	[3]			4.79E+10	5.32E+09	5.32E+10	Undetermined [2]
GAR031300020433	Denny Creek	Headwaters to Centralhatchee Creek	Fecal coliform	3.57E+10			2.86E+10	3.17E+09	3.17E+10	11.2%
			E. coli	[3]			1.80E+10	2.00E+09	2.00E+10	Undetermined [2]
GAR031300030311	Dozier Creek	Headwaters to Randall Creek	Fecal coliform	7.48E+10		2.46E+09	2.26E+10	2.78E+09	2.78E+10	62.8%
			E. coli	[3]		1.55E+09	1.42E+10	1.75E+09	1.75E+10	Undetermined [2]
GAR031300020716	East Trammel Branch	Headwaters to Yellowjacket Creek	Fecal coliform	9.57E+09			5.13E+09	5.70E+08	5.70E+09	40.4%
			E. coli	[3]			3.23E+09	3.59E+08	3.59E+09	Undetermined [2]
GAR031300030110	Flatrock Creek	Tributary to Bull Creek - Columbus	Fecal coliform	3.42E+11		7.58E+09	2.98E+10	4.15E+09	4.15E+10	87.9%
			E. coli	[3]		4.78E+09	1.87E+10	2.61E+09	2.61E+10	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300021216	Fort Creek	Headwaters to Dowdell Creek	Fecal coliform	8.08E+09	1.03E+09		4.68E+09	6.35E+08	6.35E+09	21.4%
			E. coli	[3]	6.49E+08		2.95E+09	4.00E+08	4.00E+09	Undetermined [2]
GAR031300010514	Glade Branch	Headwaters to Town Creek	Fecal coliform	8.07E+10			1.32E+10	1.47E+09	1.47E+10	81.8%
			E. coli	[3]			8.33E+09	9.25E+08	9.25E+09	Undetermined [2]
GAR031300030704	Hannahatchee Creek	Ben Owens Creek to Bussey Branch	Fecal coliform	1.08E+12			1.35E+11	1.50E+10	1.50E+11	86.1%
			E. coli	[3]			8.51E+10	9.45E+09	9.45E+10	Undetermined [2]
GAR031300020613	Hillabahatchee Creek	Alabama State line to Red Oak Creek	Fecal coliform	1.36E+14			3.06E+12	3.40E+11	3.40E+12	97.5%
			E. coli	[3]			1.93E+12	2.14E+11	2.14E+12	Undetermined [2]
GAR031300020614	Hillabahatchee Creek	Red Oak Creek to Tollieson Branch, Franklin	Fecal coliform	2.33E+13			8.40E+14	9.33E+13	9.33E+14	97.5%
			E. coli	[3]			5.29E+14	5.88E+13	5.88E+14	Undetermined [2]
GAR031300021015	House Creek	Headwaters to Sand Creek	Fecal coliform	1.47E+11			1.57E+10	1.74E+09	1.74E+10	88.1%
			E. coli	[3]			9.86E+09	1.10E+09	1.10E+10	Undetermined [2]
GAR031300020218	Lick Log Creek	Lake Romona to Mill Creek	Fecal coliform	3.40E+11		9.73E+09	1.29E+11	1.54E+10	1.54E+11	54.6%
			E. coli	[3]		6.13E+09	8.15E+10	9.73E+09	9.73E+10	Undetermined [2]
GAR031300020428	Milligan Creek	Headwaters to Pond 0.9 miles upstream of the Heard County Line	Fecal coliform	6.50E+10			3.60E+10	4.00E+09	4.00E+10	38.5%
			E. coli	[3]			2.27E+10	2.52E+09	2.52E+10	Undetermined [2]
GAR031300040205	North Prong Kolomoki Creek	Tributary 1 mile downstream of Bluffton Highway to Kolomoki Creek	Fecal coliform	1.89E+11			9.33E+10	1.04E+10	1.04E+11	45.1%
			E. coli	[3]			5.87E+10	6.53E+09	6.53E+10	Undetermined [2]
GAR031300031507	Pataula Creek	Beaver Creek to Brier Creek	Fecal coliform	1.30E+12			3.84E+11	4.27E+10	4.27E+11	67.1%
			E. coli	[3]			2.42E+11	2.69E+10	2.69E+11	Undetermined [2]
GAR031300021018	Sand Creek	Headwaters to House Creek	Fecal coliform	3.14E+10			4.81E+09	5.34E+08	5.34E+09	83.0%
			E. coli	[3]			3.03E+09	3.37E+08	3.37E+09	Undetermined [2]
GAR031300021308	Standing Boy Creek	Striblin Creek to Mobleys Lake	Fecal coliform	2.95E+12	2.64E+06		3.18E+11	3.54E+10	3.54E+11	88.0%
			E. coli	[3]	1.66E+06		2.01E+11	2.23E+10	2.23E+11	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300030204	Tar River	Headwaters to Montarella Lake	Fecal coliform	1.75E+10			1.28E+10	1.42E+09	1.42E+10	18.5%
			E. coli	[3]			8.08E+09	8.97E+08	8.97E+09	Undetermined [2]
GAR031300010512	Tate Creek	Headwaters to Chestatee River	Fecal coliform	3.57E+10			2.86E+10	3.17E+09	3.17E+10	11.2%
			E. coli	[3]			1.80E+10	2.00E+09	2.00E+10	Undetermined [2]
GAR031300020211	Town Branch	Lake Val-Do Mar to Mud Creek - Villa Rica	Fecal coliform	3.89E+10	6.09E+08	1.50E+10	1.61E+10	3.52E+09	3.52E+10	9.6%
			E. coli	[3]	3.84E+08	9.45E+09	1.01E+10	2.22E+09	2.22E+10	Undetermined [2]
GAR031300020611	Town Creek	Alabama State line to tributary 0.5 miles upstream of Arrington Rd	Fecal coliform	2.03E+13			4.56E+11	5.06E+10	5.06E+11	97.5%
			E. coli	[3]			2.87E+11	3.19E+10	3.19E+11	Undetermined [2]
GAR031300020612	Town Creek	Tributary 0.5 miles upstream of Arrington Rd to Little Creek	Fecal coliform	5.07E+13			1.14E+12	1.27E+11	1.27E+12	97.5%
			E. coli	[3]			7.19E+11	7.99E+10	7.99E+11	Undetermined [2]
GAR031300030121	Tributary to Bull Creek	Headwaters to Bull Creek	Fecal coliform	3.09E+10		2.22E+09	1.31E+09	3.92E+08	3.92E+09	87.3%
			E. coli	[3]		1.40E+09	8.23E+08	2.47E+08	2.47E+09	Undetermined [2]
GAR031300040107	Tributary to Cemochechobee Creek	Headwaters to Cemochechobee Creek	Fecal coliform	2.89E+10			1.79E+10	1.99E+09	1.99E+10	31.2%
			E. coli	[3]			1.13E+10	1.25E+09	1.25E+10	Undetermined [2]
GAR031300020224	Tributary to Lick Log Creek	Headwaters to Lick Log Creek	Fecal coliform	9.97E+09		9.05E+07	8.33E+08	1.03E+08	1.03E+09	0.0%
			E. coli	[3]		5.70E+07	5.25E+08	6.46E+07	6.46E+08	Undetermined [2]
GAR031300021103	Tributary to Mountain Creek	Callaway Gardens WPCP to Mountain Creek	Fecal coliform	6.91E+10	5.86E+08		8.40E+09	9.98E+08	9.98E+09	85.6%
			E. coli	[3]	3.69E+08		5.29E+09	6.29E+08	6.29E+09	Undetermined [2]
GAR031300021219	Tributary to Mulberry Creek	Oak View Home WPCP to Mulberry Creek	Fecal coliform	1.03E+09	1.64E+07		1.78E+08	2.16E+07	2.16E+08	79.0%
			E. coli	[3]	1.03E+07		1.12E+08	1.36E+07	1.36E+08	Undetermined [2]
GAR031300021220	Tributary to Mulberry Creek	Headwaters to Oak View Home WPCP	Fecal coliform	2.18E+10			7.85E+09	8.73E+08	8.73E+09	59.9%
			E. coli	[3]			4.95E+09	5.50E+08	5.50E+09	Undetermined [2]
GAR031300021006	White Sulfur Creek	Headwaters to Sulphur Creek	Fecal coliform	8.36E+11			1.93E+11	2.15E+10	2.15E+11	74.3%
			E. coli	[3]			1.22E+11	1.35E+10	1.35E+11	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300020804	Whitewater Creek	Headwaters to tributary 0.5 miles upstream Heard/Troup County Line	Fecal coliform	7.06E+10			2.30E+10	2.55E+09	2.55E+10	63.8%
			E. coli	[3]			1.45E+10	1.61E+09	1.61E+10	Undetermined [2]
GAR031300020805	Whitewater Creek	Tributary 0.5 miles upstream Heard/Troup County Line to West Point Lake	Fecal coliform	1.40E+11			4.57E+10	5.08E+09	5.08E+10	63.8%
			E. coli	[3]			2.88E+10	3.20E+09	3.20E+10	Undetermined [2]
Revised TMDLs[4]										
GAR031300020401	Acorn Creek	Headwaters to the Chattahoochee River	Fecal coliform	5.62E+10			9.20E+10	1.02E+10	1.02E+11	0%
			E. coli	[3]			5.80E+10	6.44E+09	6.44E+10	Undetermined [2]
GAR031300020308	Baldwin Creek	Headwaters to Little Bear Creek	Fecal coliform	3.90E+10		5.76E+09	1.55E+10	2.36E+09	2.36E+10	39%
			E. coli	[3]		3.63E+09	9.76E+09	1.49E+09	1.49E+10	Undetermined [2]
GAR031300020313	Bear Creek	Dorsett Shoals Rd. to Little Bear Creek	Fecal coliform	6.15E+10	5.86E+07	2.64E+10	5.87E+10	9.46E+09	9.46E+10	0%
			E. coli	[3]	3.69E+07	1.66E+10	3.70E+10	5.96E+09	5.96E+10	Undetermined [2]
GAR031300010813	Big Creek	Tributary to Lake Lanier	Fecal coliform	6.07E+10			3.58E+10	3.98E+09	3.98E+10	34%
			E. coli	[3]			2.26E+10	2.51E+09	2.51E+10	Undetermined [2]
GAR031300020310	Billy Creek (Previously Nancy Long Creek/Billy Creek)	Strickland Lake to the Dog River	Fecal coliform	1.60E+10			3.39E+10	3.77E+09	3.77E+10	0%
			E. coli	[3]			2.14E+10	2.38E+09	2.38E+10	Undetermined [2]
GAR031300020420	Cedar Creek	Browns Creek to the Chattahoochee River (Formerly Coweta County)	Fecal coliform	2.91E+10		8.57E+09	3.94E+11	4.47E+10	4.47E+11	0%
			E. coli	[3]		5.40E+09	2.48E+11	2.82E+10	2.82E+11	Undetermined [2]
GAR031300020421	Centralhatchee Creek	Headwaters to the Chattahoochee River	Fecal coliform	3.07E+11			5.03E+11	5.59E+10	5.59E+11	0%
			E. coli	[3]			3.17E+11	3.52E+10	3.52E+11	Undetermined [2]
GAR031300010105	Chattahoochee River	SR255 to Soquee River	Fecal coliform	3.57E+12			2.85E+12	3.17E+11	3.17E+12	11%
			E. coli	[3]			1.80E+12	2.00E+11	2.00E+12	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300010704	Chestatee River	Yahoola Creek to Lake Lanier	Fecal coliform	4.85E+12	2.58E+09		3.79E+12	4.22E+11	4.22E+12	13%
			E. coli	[3]	1.63E+09		2.39E+12	2.66E+11	2.66E+12	Undetermined [2]
GAR031300020709	Dixie Creek	Headwaters to West Point Lake - LaGrange	Fecal coliform	3.07E+10			2.89E+10	3.21E+09	3.21E+10	0%
			Enterococci	[3]			1.82E+10	2.02E+09	2.02E+10	Undetermined [2]
GAR031300031301	Drag Nasty Creek	Tributary to W. F. George	Fecal coliform	2.33E+11			9.11E+10	1.01E+10	1.01E+11	57%
			E. coli	[3]			5.74E+10	6.38E+09	6.38E+10	Undetermined [2]
GAR031300010817	Etta Vista Creek	Tributary to Lake Lanier (Gainesville)	Fecal coliform	2.86E+09		7.70E+08	1.57E+09	2.60E+08	2.60E+09	9%
			E. coli	[3]		4.85E+08	9.87E+08	1.64E+08	1.64E+09	Undetermined [2]
GAR031300021019	Flat Shoals Creek	Tributary at Stovall Road to Big Branch	Fecal coliform	2.43E+12	3.51E+08		1.47E+12	1.64E+11	1.64E+12	33%
			E. coli	[3]	2.21E+08		9.27E+11	1.03E+11	1.03E+12	Undetermined [2]
GAR031300021020	Flat Shoals Creek	Big Branch to Lake Harding	Fecal coliform	2.64E+12	3.51E+08		1.60E+12	1.78E+11	1.78E+12	33%
			E. coli	[3]	2.21E+08		1.01E+12	1.12E+11	1.12E+12	Undetermined [2]
GAR031300010812	Flowery Branch	Tributary to Lake Lanier	Fecal coliform	3.87E+10		9.22E+09	1.13E+10	2.28E+09	2.28E+10	41%
			E. coli	[3]		5.81E+09	7.11E+09	1.44E+09	1.44E+10	Undetermined [2]
GAR031300010809	Fourmile Creek	Lake Lanier Tributary	Fecal coliform	9.28E+10		6.20E+09	7.49E+10	9.01E+09	9.01E+10	3%
			E. coli	[3]		3.90E+09	4.72E+10	5.68E+09	5.68E+10	Undetermined [2]
GAR031300030701	Hannahatchee Creek	U.S. Hwy 27 to Lake W. F. George	Fecal coliform	4.76E+11			7.80E+11	8.66E+10	8.66E+11	0%
			E. coli	[3]			4.91E+11	5.46E+10	5.46E+11	Undetermined [2]
GAR031300020334	House Creek	Headwaters to Anneewakee Creek	Fecal coliform	1.81E+10		9.17E+09	7.05E+09	1.80E+09	1.80E+10	0%
			E. coli	[3]		5.77E+09	4.44E+09	1.14E+09	1.14E+10	Undetermined [2]
GAR031300010902	James Creek	Daves Creek to the Chattahoochee River	Fecal coliform	8.49E+10	3.43E+08	5.22E+10	8.64E+10	1.54E+10	1.54E+11	0%
			E. coli	[3]	1.88E+09	3.23E+10	5.34E+10	9.73E+09	9.73E+10	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300020908	Lee Branch	Tributary to Troup Branch - LaGrange	Fecal coliform	1.02E+10			5.32E+09	5.91E+08	5.91E+09	42%
			E. coli	[3]			3.35E+09	3.73E+08	3.73E+09	Undetermined [2]
GAR031300010301	Limestone Creek	Headwaters to Brenau Lake	Fecal coliform	4.48E+09		1.44E+09	1.92E+09	3.73E+08	3.73E+09	17%
			E. coli	[3]		9.04E+08	1.21E+09	2.35E+08	2.35E+09	Undetermined [2]
GAR031300020305	Little Bear Creek	Annewakee Lake to Bear Creek	Fecal coliform	9.70E+10		1.42E+10	7.09E+10	9.46E+09	9.46E+10	2%
			E. coli	[3]		8.98E+09	4.47E+10	5.96E+09	5.96E+10	Undetermined [2]
GAR031300010816	Longwood Park Creek	Tributary to Lake Lanier (Gainesville)	Fecal coliform	2.29E+09		1.03E+09	1.02E+09	2.29E+08	2.29E+09	0%
			E. coli	[3]		6.51E+08	6.45E+08	1.44E+08	1.44E+09	Undetermined [2]
GAR031300010303	Mossy Creek	Totherow Rd. near Clermont to Chattahoochee River	Fecal coliform	2.55E+11			4.18E+11	4.64E+10	4.64E+11	0%
			E. coli	[3]			2.63E+11	2.92E+10	2.92E+11	Undetermined [2]
GAR031300020508	New River	Mountain Creek to West Point Lake - Corinth	Fecal coliform	1.13E+12	5.86E+08	2.62E+10	9.41E+11	1.08E+11	1.08E+12	5%
			E. coli	[3]	2.98E+09	1.64E+10	5.90E+11	6.77E+10	6.77E+11	Undetermined [2]
GAR031300020408	Panther Creek	Headwaters to Cedar Creek	Fecal coliform	3.02E+10		3.04E+07	3.62E+10	4.03E+09	4.03E+10	0%
			E. coli	[3]		1.92E+07	2.28E+10	2.54E+09	2.54E+10	Undetermined [2]
GAR031300020907	Park Branch	Tributary to Troup Branch - LaGrange	Fecal coliform	6.33E+09			6.33E+09	7.03E+08	7.03E+09	0%
			E. coli	[3]			3.99E+09	4.43E+08	4.43E+09	Undetermined [2]
GAR031300020702	Pepperell Creek	Headwaters to tributary 0.55 miles upstream of Shoal Creek, LaGrange	Fecal coliform	1.26E+10			1.51E+10	1.68E+09	1.68E+10	0%
			E. coli	[3]			9.53E+09	1.06E+09	1.06E+10	Undetermined [2]
GAR031300010814	Rock Creek	Headwaters to Lake Lanier (Gainesville)	Fecal coliform	1.52E+09		7.39E+08	7.40E+08	1.64E+08	1.64E+09	0%
			E. coli	[3]		4.66E+08	4.66E+08	1.04E+08	1.04E+09	Undetermined [2]
GAR031300010804	Sawnee Creek	Lake Lanier Tributary	Fecal coliform	5.59E+10		9.54E+09	3.42E+10	4.86E+09	4.86E+10	13%
			E. coli	[3]		6.01E+09	2.15E+10	3.06E+09	3.06E+10	Undetermined [2]
GAR031300010805	Six Mile Creek	Headwaters to Lake Lanier	Fecal coliform	6.04E+10		2.59E+08	3.44E+10	3.85E+09	3.85E+10	36%
			E. coli	[3]		1.63E+08	2.16E+10	2.42E+09	2.42E+10	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300010815	Slaughterhouse Creek	Tributary to Lake Lanier (Gainesville)	Fecal coliform	3.45E+09		3.04E+09	2.60E+09	6.28E+08	6.28E+09	0%
			E. coli	[3]		1.92E+09	1.64E+09	3.95E+08	3.95E+09	Undetermined [2]
GAR031300020341	Snake Creek	Little Snake Creek to Crews Creek	Fecal coliform	2.92E+11			2.63E+11	2.92E+10	2.92E+11	0%
			E. coli	[3]			1.66E+11	1.84E+10	1.84E+11	Undetermined [2]
GAR031300020342	Snake Creek	Crews Creek to GA Hwy 5	Fecal coliform	4.05E+11			3.65E+11	4.05E+10	4.05E+11	0%
			E. coli	[3]			2.30E+11	2.55E+10	2.55E+11	Undetermined [2]
GAR031300020343	Snake Creek	GA Hwy 5 to the Chattahoochee River	Fecal coliform	4.54E+11			4.09E+11	4.54E+10	4.54E+11	0%
			E. coli	[3]			2.58E+11	2.86E+10	2.86E+11	Undetermined [2]
GAR031300010806	South Fork Balus Creek	Headwaters to Balus Creek (Gainesville)	Fecal coliform	6.62E+10	3.40E+06	1.10E+10	1.67E+10	3.08E+09	3.08E+10	53%
			E. coli	[3]	2.14E+06	6.93E+09	1.05E+10	1.94E+09	1.94E+10	Undetermined [2]
GAR031300010304	South Fork Limestone Creek/Limestone Creek	Headwaters to Limestone Creek Arm of Lake Lanier	Fecal coliform	5.00E+10		1.76E+10	1.84E+10	4.00E+09	4.00E+10	20%
			E. coli	[3]		1.11E+10	1.16E+10	2.52E+09	2.52E+10	Undetermined [2]
GAR031300010701	Taylor Creek	Headwaters to Lake Lanier	Fecal coliform	2.29E+10		8.41E+07	3.75E+10	4.17E+09	4.17E+10	0%
			E. coli	[3]		5.30E+07	2.36E+10	2.63E+09	2.63E+10	Undetermined [2]
GAR031300010702	Toto Creek	Headwaters to Lake Lanier	Fecal coliform	7.38E+09			4.96E+09	1.14E+09	1.14E+10	0%
			E. coli	[3]			3.13E+09	7.15E+08	7.15E+09	Undetermined [2]
GAR031300010318	Tributary to Limestone Creek	Breneau Lake to Limestone Creek	Fecal coliform	2.06E+10		5.26E+09	1.55E+10	1.72E+09	1.72E+10	17%
			E. coli	[3]		3.31E+09	9.74E+09	1.08E+09	1.08E+10	Undetermined [2]
GAR031300010407	Tributary to West Fork Little River	Headwaters to West Fork Little River in Clermont	Fecal coliform	1.31E+10			9.40E+09	1.04E+09	1.04E+10	20%
			E. coli	[3]			5.92E+09	6.58E+08	6.58E+09	Undetermined [2]
GAR031300020904	Troup Branch	Tributary to Blue John Creek - LaGrange	Fecal coliform	2.58E+10			1.86E+10	2.07E+09	2.07E+10	20%
			E. coli	[3]			1.17E+10	1.30E+09	1.30E+10	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)(1)	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300010807	Two Mile Creek	Headwaters to Lake Lanier	Fecal coliform	7.55E+10		1.73E+09	4.36E+10	5.03E+09	5.03E+10	33%
			E. coli	(3)		1.09E+09	2.75E+10	3.17E+09	3.17E+10	Undetermined (2)
GAR031300010403	Wahoo Creek	SR 52 to Lake Lanier	Fecal coliform	9.23E+11			3.04E+11	3.48E+10	3.48E+11	62%
			E. coli	(3)			1.92E+11	2.19E+10	2.19E+11	Undetermined (2)
GAR031300020412	Wahoo Creek	Downstream Arnco Mills Lake	Fecal coliform	7.53E+11	3.70E+09	9.13E+09	2.66E+11	3.01E+10	3.01E+11	60%
			E. coli	(3)	2.33E+09	5.75E+09	1.67E+11	1.90E+10	1.90E+11	Undetermined (2)
GAR031300010404	West Fork Little River	Headwaters to Jim Hood Road above Lake Lanier	Fecal coliform	3.47E+11		1.72E+09	2.48E+11	2.78E+10	2.78E+11	20%
			E. coli	(3)		1.09E+09	1.56E+11	1.75E+10	1.75E+11	Undetermined (2)
GAR031300020430	Whooping Creek	Headwaters to Carthbody Creek	Fecal coliform	1.72E+11	3.86E+07		1.07E+11	1.19E+10	1.19E+11	31%
			E. coli	(3)	2.43E+07		6.74E+10	7.49E+09	7.49E+10	Undetermined (2)
GAR031300020431	Whooping Creek	Carthbody Creek to the Chattahoochee River	Fecal coliform	4.19E+11	3.86E+07		2.60E+11	2.89E+10	2.89E+11	31%
			E. coli	(3)	2.43E+07		1.64E+11	1.82E+10	1.82E+11	Undetermined (2)
GAR031300020321	Wolf Creek	Headwaters to Chattahoochee River	Fecal coliform	1.00E+11			1.39E+11	1.54E+10	1.54E+11	0%
			E. coli	(3)			8.76E+10	9.73E+09	9.73E+10	Undetermined (2)
GAR031300020714	Yellowjacket Creek	Hogansville to West Point Lake	Fecal coliform	8.79E+11	1.82E+09		6.86E+11	7.65E+10	7.65E+11	13%
			E. coli	(3)	1.14E+09		4.32E+11	4.82E+10	4.82E+11	Undetermined (2)

(1) The assigned bacterial load from the NPDES permitted facility for WLA was determined as the product of the permitted flow and bacteria permit limit.
(2) Percent reduction could not be determined due to absence of current load calculation.
(3) Critical loading could not be determined due to no samples collected.
(4) The original EPA TMDL model was run for a critical time period using the "calibrated" fecal and flow parameters. The model run resulted in a summer fecal coliform 30 day geometric mean concentration. The existing load was calculated using this concentration times the annual flow.

1.0 INTRODUCTION

1.1 Background

The State of Georgia assesses its waterbodies for compliance with water quality criteria established for their designated uses as required by the CWA. Assessed waterbodies are placed into one of three categories, supporting designated use, not supporting designated use, or assessment pending, depending on water quality assessment results. These waterbodies are found on Georgia's 2022 305(b) list as required by that section of the CWA that defines the assessment process and are published in *Water Quality in Georgia 2020-2021* (GA EPD, 2022). This document is available on the GA EPD website.

The subset of the waterbodies that do not meet designated uses on the 305(b) list are also assigned to Georgia's 303(d) list, named after that section of the CWA. Although the 305(b) and 303(d) lists are two distinct requirements under the CWA, Georgia reports both lists in one combined format called the Integrated 305(b)/303(d) List, which is found in Appendix A of *Water Quality in Georgia 2020-2021* (GA EPD, 2022). Waterbodies on the 303(d) list are denoted as Category 5, and are required to have a Total Maximum Daily Load (TMDL) evaluation for the water quality constituent(s) in violation of the water quality standard(s).

The TMDL formulations in this document are based on impaired segments contained in the 2022 305(b)/303(d) List. The TMDL process establishes the allowable pollutant loadings or other quantifiable parameters for a waterbody based on the relationship between pollutant sources and instream water quality conditions. This allows water quality-based controls to be developed to reduce pollution and restore and maintain water quality.

The 303(d) list identifies the stream segments that are not supporting its designated use classification due to exceedances of water quality criteria for bacteria. Fecal coliform, *E. coli,* and enterococci bacteria are used as indicators of the potential presence of pathogens in a stream. Table 2 presents the thirty-seven (37) stream segments in the Chattahoochee River Basin included on the 2022 303(d) list for exceedances of the fecal coliform criteria.

Table 3 lists the fifty (50) stream segments in the Chattahoochee River Basin where the previously approved TMDLs are being revised. These TMDLs were developed by USEPA using the BASINS watershed modeling approach. In the mid-2000s, GA EPD redid a majority of fecal coliform TMDLs that had been developed using BASINS. The revised TMDLs are being included to ensure that all previously issued fecal coliform TMDL calculations use the Loading Curve Approach and include WLAs and TMDLs for the new bacterial indicators.

Table 2: Stream Segments Listed on the 2022 303(d) List for Bacteria in the Chattahoochee River Basin

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use
Anneewakee Creek	Lake Monroe to Chattahoochee River	GAR031300020304	5	Fishing
Brush Creek	Tributary to West Point Lake	GAR031300020605	10	Fishing
Chattahoochee River	Dicks Creek to Johns Creek	GAR031300010913	12	Drinking Water, Recreation, Fishing
Coheelee Creek	Chancy Mill Creek to Chattahoochee River	GAR031300040502	5	Fishing
Cooper Creek	Headwaters to Bull Creek - Columbus	GAR031300030107	8.3	Fishing
Crawford Creek	Headwaters to Sulphur Creek	GAR031300021010	7.1	Fishing
Deer Creek	Headwaters to Centralhatchee Creek	GAR031300020422	9.6	Fishing
Denny Creek	Headwaters to Centralhatchee Creek	GAR031300020433	4	Fishing
Dozier Creek	Headwaters to Randall Creek	GAR031300030311	7	Fishing
East Trammel Branch	Headwaters to Yellowjacket Creek	GAR031300020716	3	Fishing
Flatrock Creek	Tributary to Bull Creek - Columbus	GAR031300030110	3	Fishing
Fort Creek	Headwaters to Dowdell Creek	GAR031300021216	3	Fishing
Glade Branch	Headwaters to Town Creek	GAR031300010514	2	Fishing
Hannahatchee Creek	Ben Owens Creek to Bussey Branch	GAR031300030704	7	Fishing
Hillabahatchee Creek	Alabama State line to Red Oak Creek	GAR031300020613	4.8	Fishing
Hillabahatchee Creek	Red Oak Creek to Tollieson Branch, Franklin	GAR031300020614	13.3	Fishing
House Creek	Headwaters to Sand Creek	GAR031300021015	11	Fishing
Lick Log Creek	Lake Romona to Mill Creek	GAR031300020218	2	Fishing
Milligan Creek	Headwaters to Pond 0.9 miles upstream of the Heard County Line	GAR031300020428	5	Fishing

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use
North Prong Kolomoki Creek	Tributary 1 mile downstream of Bluffton Highway to Kolomoki Creek	GAR031300040205	5	Fishing
Pataula Creek	Beaver Creek to Brier Creek	GAR031300031507	2.8	Fishing
Sand Creek	Headwaters to House Creek	GAR031300021018	9	Fishing
Standing Boy Creek	Striblin Creek to Mobleys Lake	GAR031300021308	5	Fishing
Tar River	Headwaters to Montarella Lake	GAR031300030204	4	Fishing
Tate Creek	Headwaters to Chestatee River	GAR031300010512	4	Fishing
Town Branch	Lake Val-Do Mar to Mud Creek - Villa Rica	GAR031300020211	2.9	Fishing
Town Creek	Alabama State line to tributary 0.5 miles upstream of Arrington Rd	GAR031300020611	2.7	Fishing
Town Creek	Tributary 0.5 miles upstream of Arrington Rd to Little Creek	GAR031300020612	4	Fishing
Tributary to Bull Creek	Headwaters to Bull Creek	GAR031300030121	2	Fishing
Tributary to Cemochechobee Creek	Headwaters to Cemochechobee Creek	GAR031300040107	3	Fishing
Tributary to Lick Log Creek	Headwaters to Lick Log Creek	GAR031300020224	1.8	Fishing
Tributary to Mountain Creek	Callaway Gardens WPCP to Mountain Creek	GAR031300021103	2	Fishing
Tributary to Mulberry Creek	Oak View Home WPCP to Mulberry Creek	GAR031300021219	3	Fishing
Tributary to Mulberry Creek	Headwaters to Oak View Home WPCP	GAR031300021220	0.1	Fishing
White Sulfur Creek	Headwaters to Sulphur Creek	GAR031300021006	9	Fishing
Whitewater Creek	Headwaters to tributary 0.5 miles upstream Heard/Troup County Line	GAR031300020804	7.5	Fishing
Whitewater Creek	Tributary 0.5 miles upstream Heard/Troup County Line to West Point Lake	GAR031300020805	3.8	Fishing

Table 3: Stream Segments with Revised TMDLs for Bacteria in the Chattahoochee River Basin

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use	Original TMDL Action ID Number, Agency, and Year
Acorn Creek	Headwaters to the Chattahoochee River	GAR031300020401	6.5	Fishing	1 US EPA 1998
Baldwin Creek	Headwaters to Little Bear Creek	GAR031300020308	3.8	Fishing	49 US EPA 1998
Bear Creek	Dorsett Shoals Rd. to Little Bear Creek	GAR031300020313	3.5	Fishing	73 US EPA 1998
Big Creek	Tributary to Lake Lanier	GAR031300010813	2	Fishing	107 US EPA 1998
Billy Creek (Previously Nancy Long Creek/Billy Creek)	Strickland Lake to the Dog River	GAR031300020310	4.2	Fishing	846 US EPA 1998
Cedar Creek	Browns Creek to the Chattahoochee River (Formerly Coweta County)	GAR031300020420	6	Fishing	230 US EPA 1998
Centralhatchee Creek	Headwaters to the Chattahoochee River	GAR031300020421	19	Fishing	237 US EPA 1998
Chattahoochee River	SR255 to Soquee River	GAR031300010105	11	Recreation, Fishing	247 US EPA 1998
Chestatee River	Yahoola Creek to Lake Lanier	GAR031300010704	9	Fishing	261 US EPA 1998
Dixie Creek	Headwaters to West Point Lake - LaGrange	GAR031300020709	3.4	Fishing	376 US EPA 1998
Drag Nasty Creek	Tributary to W. F. George	GAR031300031301	7	Fishing	381 US EPA 1998
Etta Vista Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010817	1	Fishing	423 US EPA 1998
Flat Shoals Creek	Tributary at Stovall Road to Big Branch	GAR031300021019	19	Fishing	439 US EPA 1998
Flat Shoals Creek	Big Branch to Lake Harding	GAR031300021020	9	Fishing	439 US EPA 1998

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use	Original TMDL Action ID Number, Agency, and Year
Flowery Branch	Tributary to Lake Lanier	GAR031300010812	1	Fishing	445 US EPA 1998
Fourmile Creek	Lake Lanier Tributary	GAR031300010809	3	Fishing	452 US EPA 1998
Hannahatchee Creek	U.S. Hwy 27 to Lake W. F. George	GAR031300030701	14	Fishing	517 US EPA 1998
House Creek	Headwaters to Anneewakee Creek	GAR031300020334	2.4	Fishing	546 US EPA 1998
James Creek	Daves Creek to the Chattahoochee River	GAR031300010902	2	Fishing	570 US EPA 1998
Lee Branch	Tributary to Troup Branch - LaGrange	GAR031300020908	1	Fishing	670 US EPA 1998
Limestone Creek	Headwaters to Brenau Lake	GAR031300010301	0.9	Fishing	684 US EPA 1998
Little Bear Creek	Annewakee Lake to Bear Creek	GAR031300020305	3.7	Fishing	692 US EPA 1998
Longwood Park Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010816	1	Fishing	725 US EPA 1998
Mossy Creek	Totherow Rd. near Clermont to Chattahoochee River	GAR031300010303	7	Fishing	823 US EPA 1998
New River	Mountain Creek to West Point Lake - Corinth	GAR031300020508	4.4	Fishing	859 US EPA 1998
Panther Creek	Headwaters to Cedar Creek	GAR031300020408	3.2	Fishing	903 US EPA 1998
Park Branch	Tributary to Troup Branch - LaGrange	GAR031300020907	2	Fishing	908 US EPA 1998
Pepperell Creek	Headwaters to tributary 0.55 miles upstream of Shoal Creek, LaGrange	GAR031300020702	2	Fishing	922 US EPA 1998
Rock Creek	Headwaters to Lake Lanier (Gainesville)	GAR031300010814	0.5	Fishing	1009 US EPA 1998
Sawnee Creek	Lake Lanier Tributary	GAR031300010804	2	Fishing	1057 US EPA 1998

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use	Original TMDL Action ID Number, Agency, and Year
Six Mile Creek	Headwaters to Lake Lanier	GAR031300010805	2	Fishing	1080 US EPA 1998
Slaughterhouse Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010815	0.7	Fishing	1086 US EPA 1998
Snake Creek	Little Snake Creek to Crews Creek	GAR031300020341	1.1	Fishing	1091 US EPA 1998
Snake Creek	Crews Creek to GA Hwy 5	GAR031300020342	7.2	Fishing, Drinking Water	1091 US EPA 1998
Snake Creek	GA Hwy 5 to the Chattahoochee River	GAR031300020343	5	Fishing, Drinking Water	1091 US EPA 1998
South Fork Balus Creek	Headwaters to Balus Creek (Gainesville)	GAR031300010806	2	Fishing	1100 US EPA 1998
South Fork Limestone Creek/Limestone Creek	Headwaters to Limestone Creek Arm of Lake Lanier	GAR031300010304	2	Fishing	1105 US EPA 1998
Taylor Creek	Headwaters to Lake Lanier	GAR031300010701	3	Fishing	1185 US EPA 1998
Toto Creek	Headwaters to Lake Lanier	GAR031300010702	1.2	Fishing	1205 US EPA 1998
Tributary to Limestone Creek	Breneau Lake to Limestone Creek	GAR031300010318	1	Fishing	183 US EPA 1998
Tributary to West Fork Little River	Headwaters to West Fork Little River in Clermont	GAR031300010407	1.7	Fishing	1213 US EPA 1998
Troup Branch	Tributary to Blue John Creek - LaGrange	GAR031300020904	1	Fishing	1224 US EPA 1998
Two Mile Creek	Headwaters to Lake Lanier	GAR031300010807	5	Fishing	1242 US EPA 1998
Wahoo Creek	SR 52 to Lake Lanier	GAR031300010403	5	Fishing	1628 US EPA 1998
Wahoo Creek	Downstream Arnco Mills Lake	GAR031300020412	5	Fishing	1285 US EPA 1998
West Fork Little River	Headwaters to Jim Hood Road above Lake Lanier	GAR031300010404	12	Fishing	1722 US EPA 1998

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use	Original TMDL Action ID Number, Agency, and Year
Whooping Creek	Headwaters to Carthbody Creek	GAR031300020430	8	Fishing	1331 US EPA 1998
Whooping Creek	Carthbody Creek to the Chattahoochee River	GAR031300020431	5	Fishing	1331 US EPA 1998
Wolf Creek	Headwaters to Chattahoochee River	GAR031300020321	10	Fishing	1347 US EPA 1998
Yellowjacket Creek	Hogansville to West Point Lake	GAR031300020714	5	Fishing	1355 US EPA 1998

1.2 Watershed Description

The Chattahoochee River Basin is located primarily in west Georgia and east Alabama, with a small portion in north Florida. It occupies an area of 8,707 square miles, of which 6,002 square miles (69%) lie in Georgia. The Chattahoochee River Basin falls within the Blue Ridge, Piedmont, and Coastal Plain Ecoregions that extend throughout the southeastern United States. The Chattahoochee River originates in the southeast corner of Union County, in north Georgia, within the Blue Ridge Mountains. The river flows southwest to Lake Sidney Lanier, then through the Atlanta metropolitan area to West Point Lake where it forms the border between Georgia and Alabama. It continues flowing south through Lake Harding, Lake Oliver, and Walter F. George Reservoir. The river finally converges with the Flint River in Lake Seminole, at the Georgia-Florida border. The outflow from Lake Seminole forms the Apalachicola River in Florida, which ultimately discharges to the Gulf of Mexico.

The Chattahoochee River Basin is divided into four United States Geologic Survey (USGS) eight-digit hydrologic units, HUC 03130001 – 03130004. Figure 1 shows the location of the Chattahoochee River Basin in the State of Georgia. Figure 2 shows the locations of the four hydrologic units within the Chattahoochee River Basin. Figure 3 through Figure 19 indicate the location of the 303(d) listed stream segments and revised TMDL stream segments in the Chattahoochee River Basin.

The land use characteristics of the Chattahoochee River Basin watersheds were determined using data from the Georgia Land Use Trends (GLUT) for Year 2015. This raster land use trend product was developed by the University of Georgia – Natural Resources Spatial Analysis Laboratory (NARSAL) and follows land use trends for years 1974, 1985, 1991, 1998, 2001, 2005, 2008 and 2015. The raster data sets were developed from Landsat Thematic Mapper (TM) and Enhanced Thematic Mapper Plus (ETM+). Some of the NARSAL land use types were reclassified, aggregated into similar land use types, and used in the final watershed characterization. Table 4 lists the watershed land use distribution for the drainage areas of the stream segments.

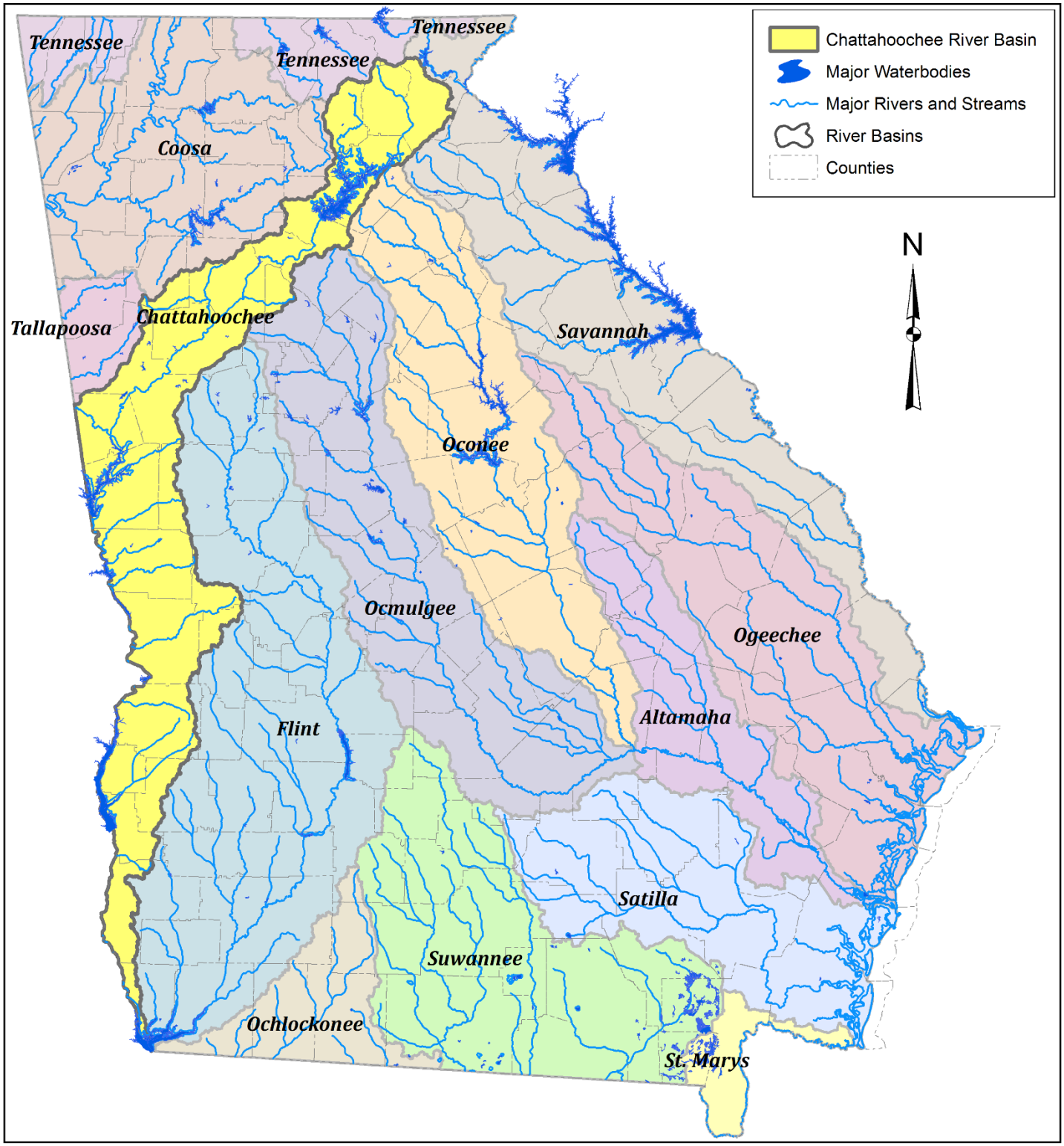

Figure 1: Location of the Chattahoochee River Basin in Georgia

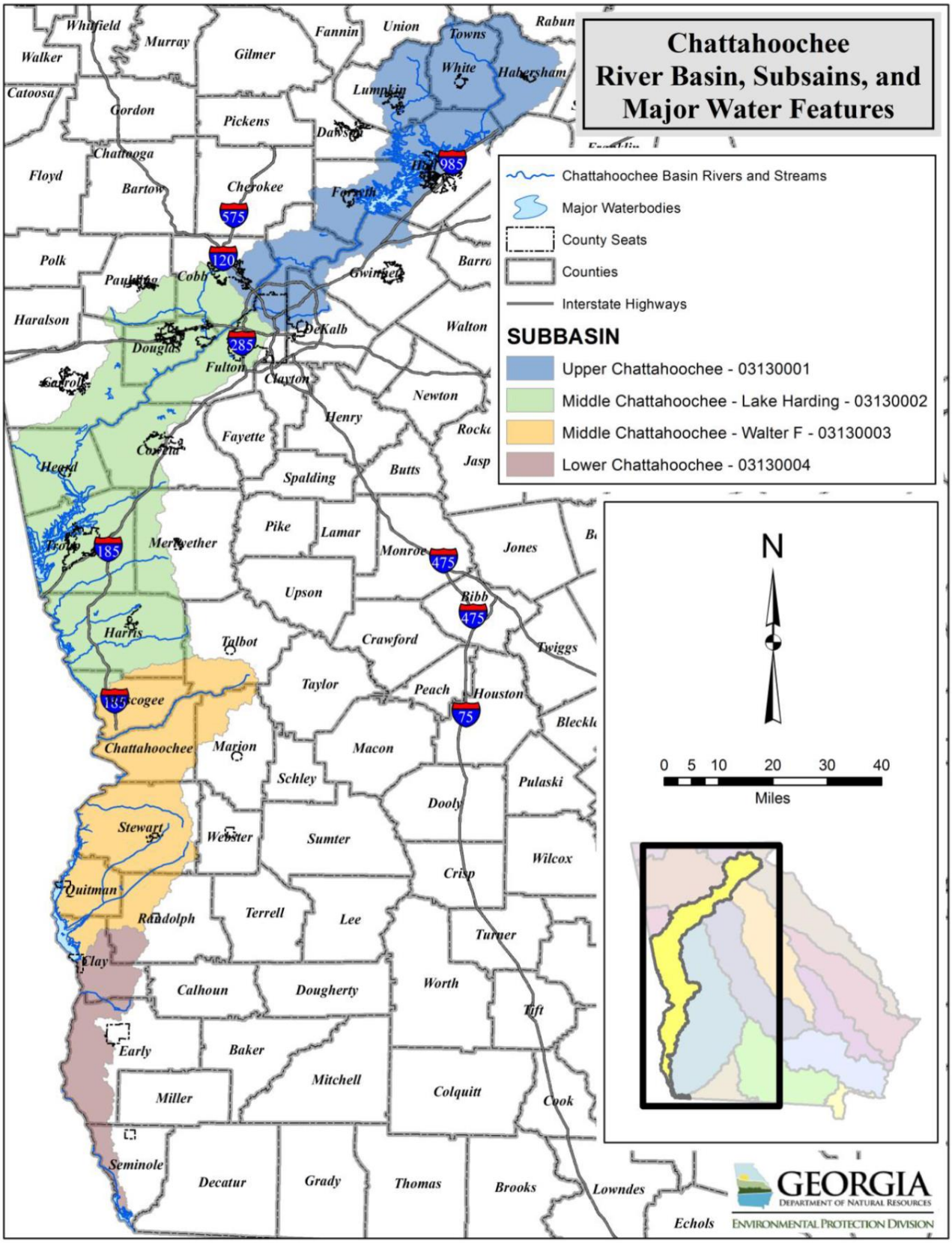

Figure 2: Major Political Boundaries, Water Features, and U.S.G.S. 8-digit HUs

1.3 State Water Planning

The Georgia Legislature enacted the Metropolitan North Georgia Water Planning District Act in 2001 to create the Metropolitan North Georgia Water Planning District (MNGWPD) to preserve and protect water resources in the 15-county metropolitan Atlanta area. The MNGWPD is charged with the development of comprehensive regional and watershed specific water resource management plans to be implemented by local governments in the metropolitan Atlanta area. The MNGWPD issued its first water resource management plan documents in 2003.

In 2004, the Georgia Legislature enacted the Comprehensive State-wide Water Management Planning Act to ensure management of water resources in a sustainable manner to support the state's economy, to protect public health and natural systems, and to enhance the quality of life for all citizens on a state-wide level. GA EPD later developed the 2008 Comprehensive State-wide Water Management Plan, which established Georgia's ten Regional Water Planning Councils (RWPCs) and laid the groundwork for RWPCs to develop their own Regional Water Plans. The boundaries of these ten RWPCs, in addition to the MNGWPD, are shown in Figure 20. All waterbodies covered by the TMDL are located within the boundaries of either the MNGWPD, Coosa-North Georgia Water Planning Region, Middle Chattahoochee Water Planning Region, Upper Flint Water Planning Region, or Lower Flint-Ochlockonee Water Planning Region.

In 2011, each RWPC developed and adopted Regional Water Plans, which identify ranges of actions or management practices to help meet the State's water quality challenges. Implementation of these plans is critical in meeting Georgia's water resource challenges. Metro District, Coosa-North Georgia WRPC, Middle Chattahoochee WRPC, Upper Flint WRPC, and Lower Flint-Ochlockonee WRPC updated their Regional Water Plans in June 2023, which were adopted by GA EPD in July 2023. The next set of updated Regional Water Plans should be adopted by GA EPD in June 2028. These Regional Water Plans are available here.

1.4 Water Quality Standard

Every waterbody in the State has one or more designated uses, and each designated use has water quality criteria established to protect it. Waterbodies in Georgia are assessed based on the 305(b/303(d) Listing Assessment Methodology, as such GA EPD placed thirty-seven (37) stream segments in the Chattahoochee River Basin on the 2022 303(d) list of impaired waters because they were assessed as "not supporting" their designated uses of "Fishing," "Recreation," and/or "Drinking Water" due to violations of the fecal coliform criteria presented in Table 2. The potential causes listed include urban runoff and nonpoint sources. This document also establishes revised TMDLs for fifty (50) stream segments in the Chattahoochee River Basin. Forty-seven (47) of these segments have the designated use of "Fishing", one has the designated uses of "Fishing" and "Recreation," and two segments have the designated uses of "Fishing" and "Drinking Water". A waterbody is assessed as "not supporting" its use if more than ten percent of the geometric means are greater than their seasonal waterbody specific criteria or if more than ten percent of the samples exceed the single sample criteria.

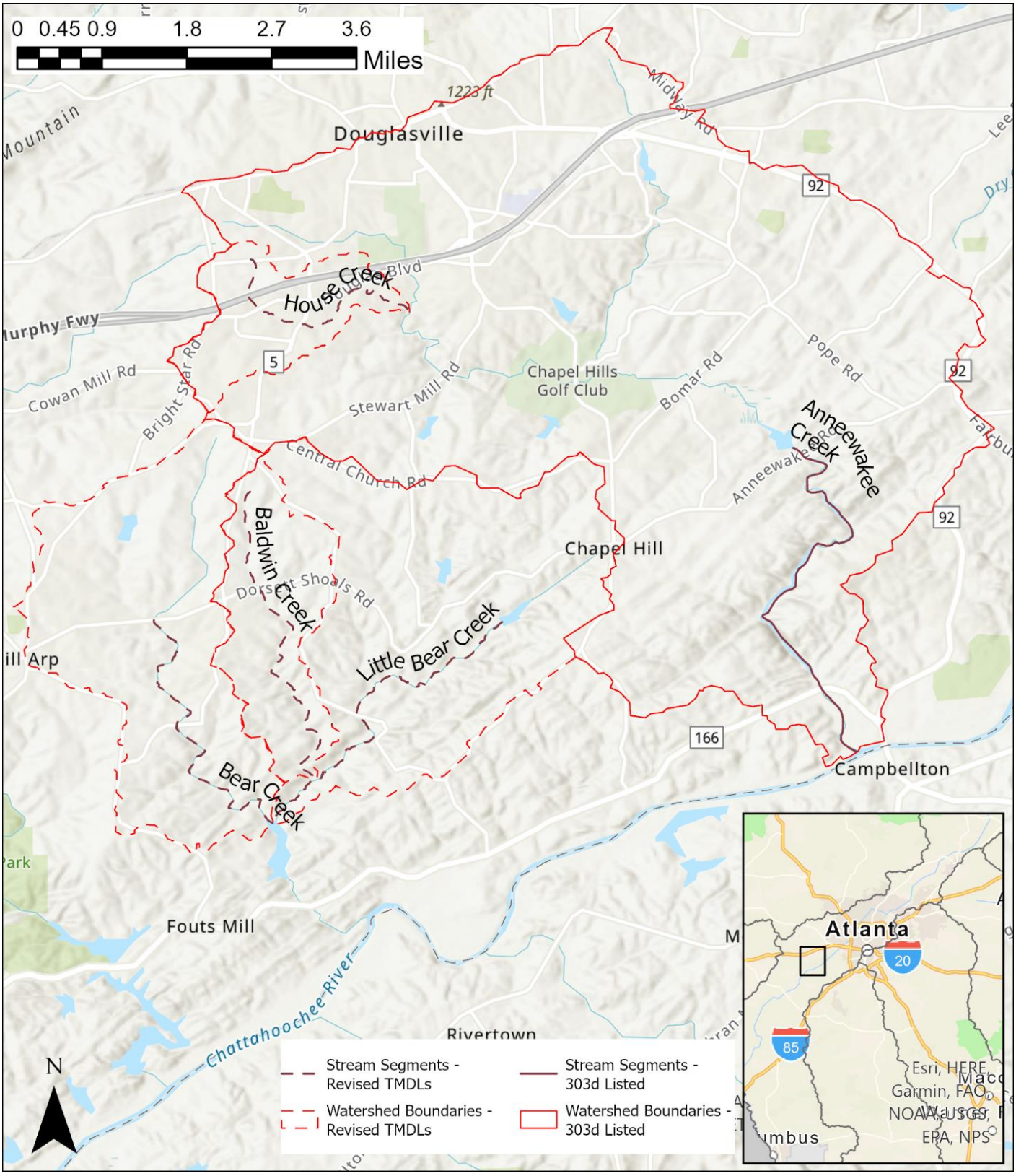

Figure 3: Stream Segments of Anneewakee Creek, Baldwin Creek, Bear Creek, House Creek (Revised), and Little Bear Creek

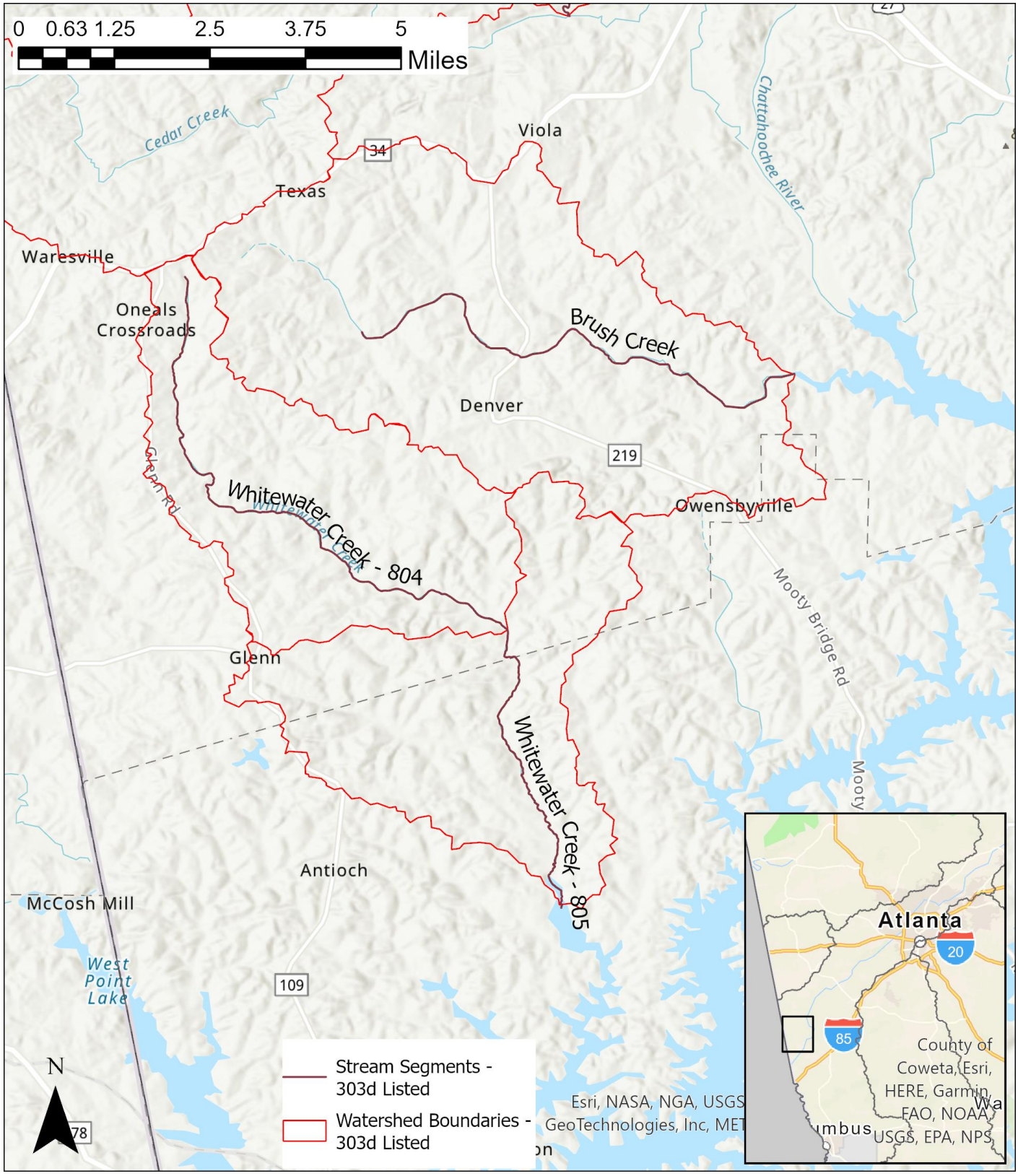

Figure 4: Stream Segments of Brush Creek, Whitewater Creek – upstream, and Whitewater Creek - downstream

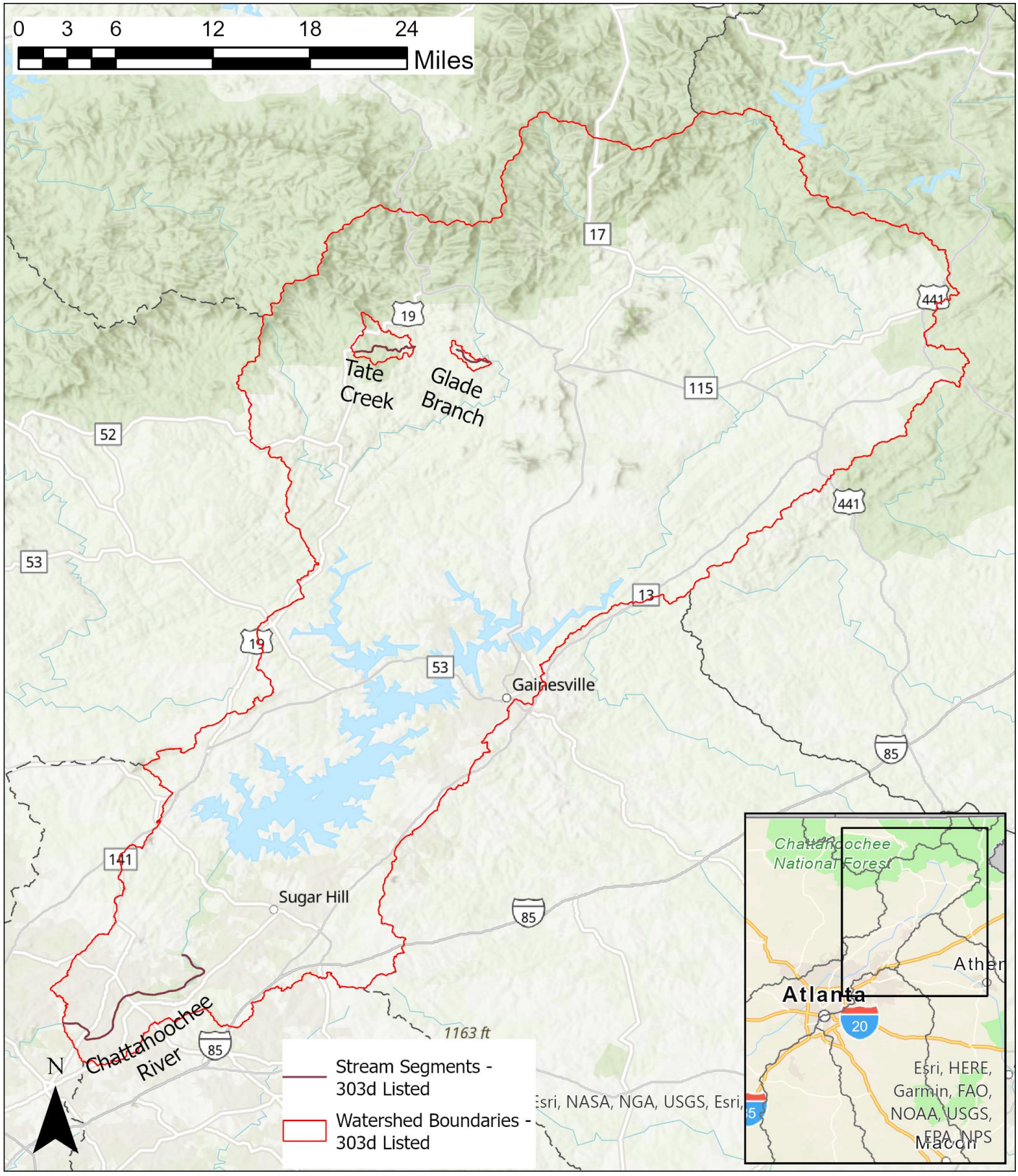

Figure 5: Stream Segments of Chattahoochee River (Dicks Creek to Johns Creek), Glade Branch, and Tate Creek

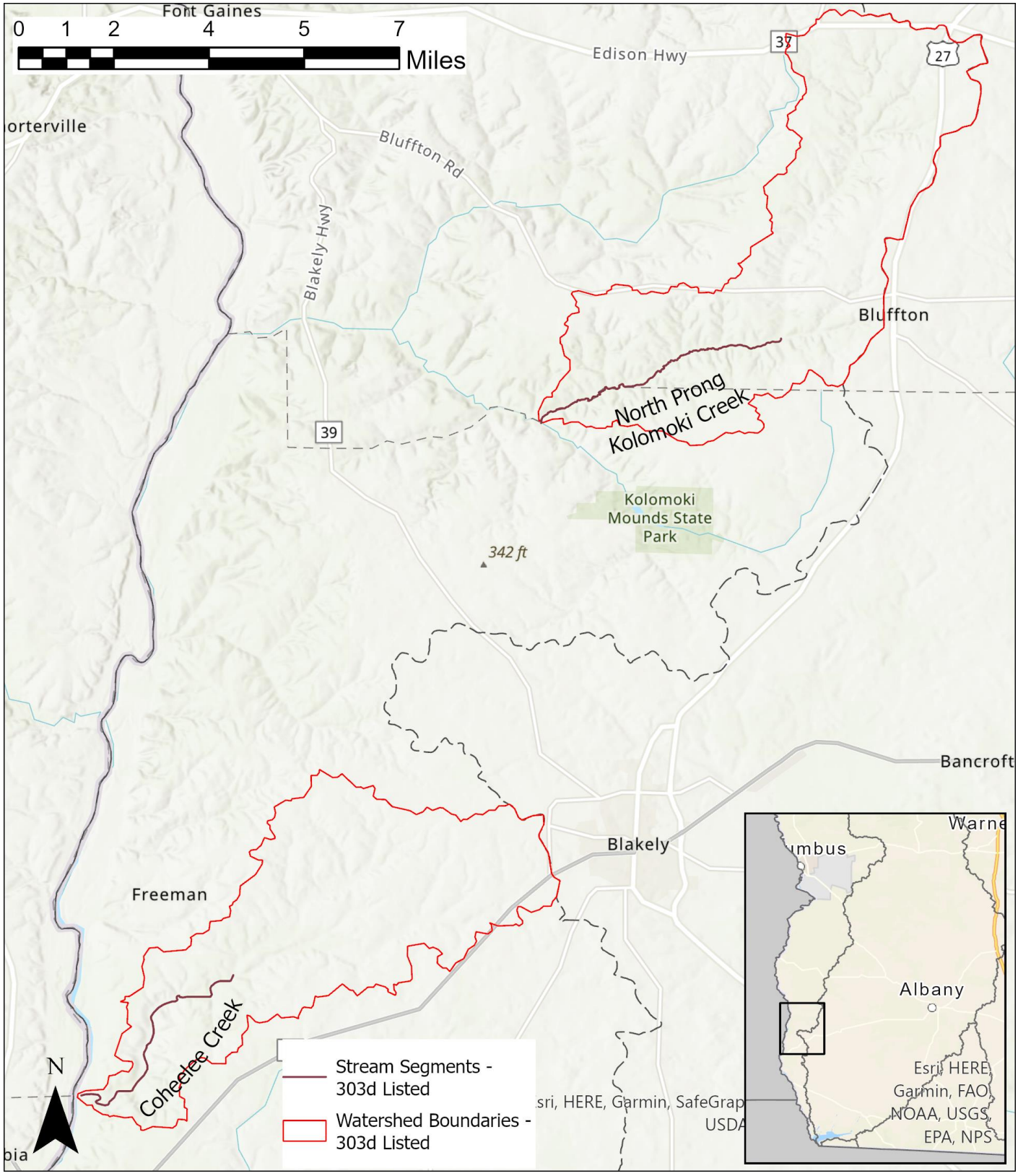

Figure 6: Stream Segments of Coheelee Creek and North Prong Kolomoki Creek

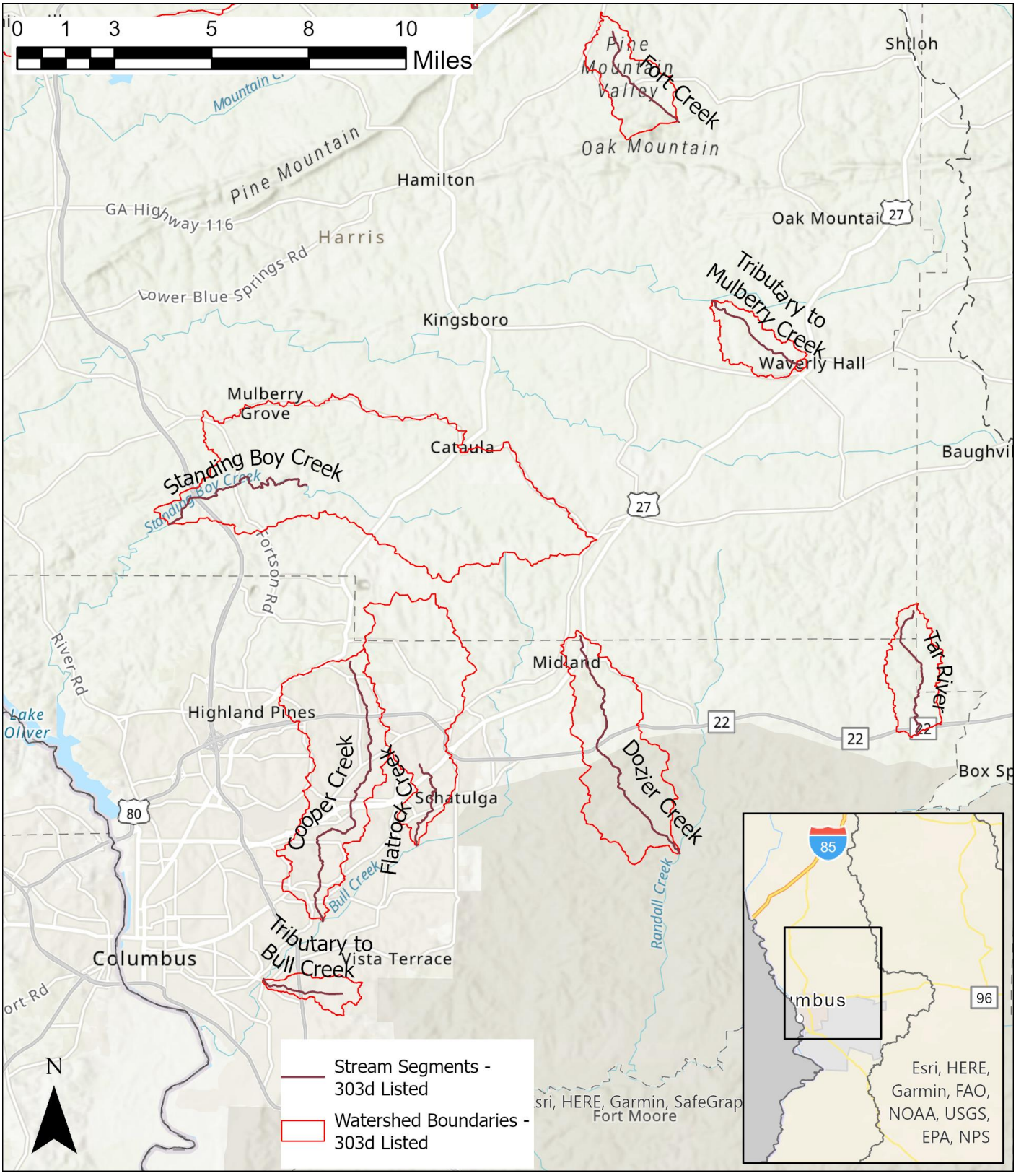

Figure 7: Stream Segments of Cooper Creek, Dozier Creek, Flatrock Creek, Standing Boy Creek, Tar River, Tributary to Bull Creek and Tributary to Mulberry Creek

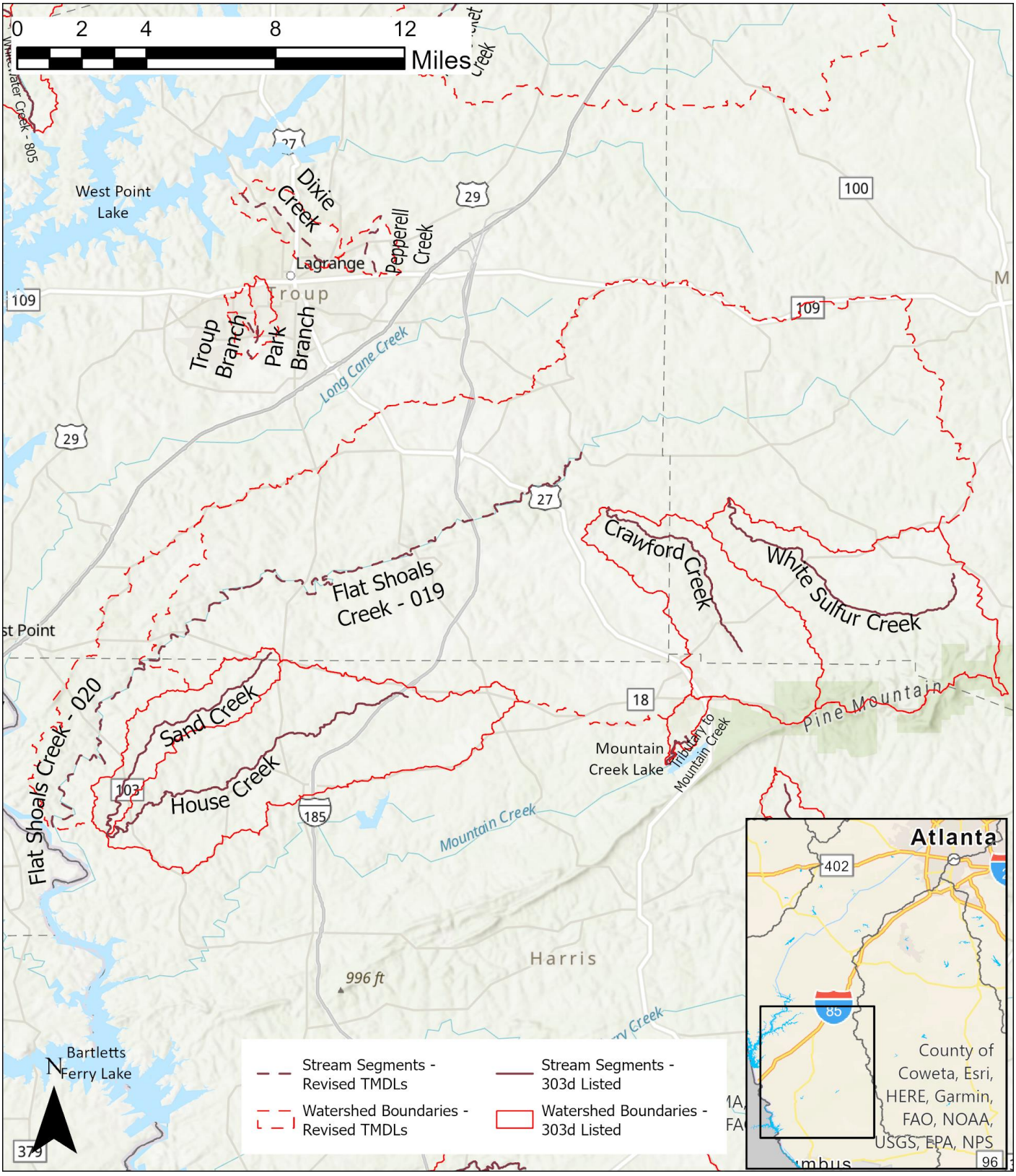

Figure 8: Stream Segments of Crawford Creek, Flat Shoals Creek – upstream, Flat Shoals Creek – downstream, House Creek, Sand Creek, Tributary to Mountain Creek, and White Sulfur Creek

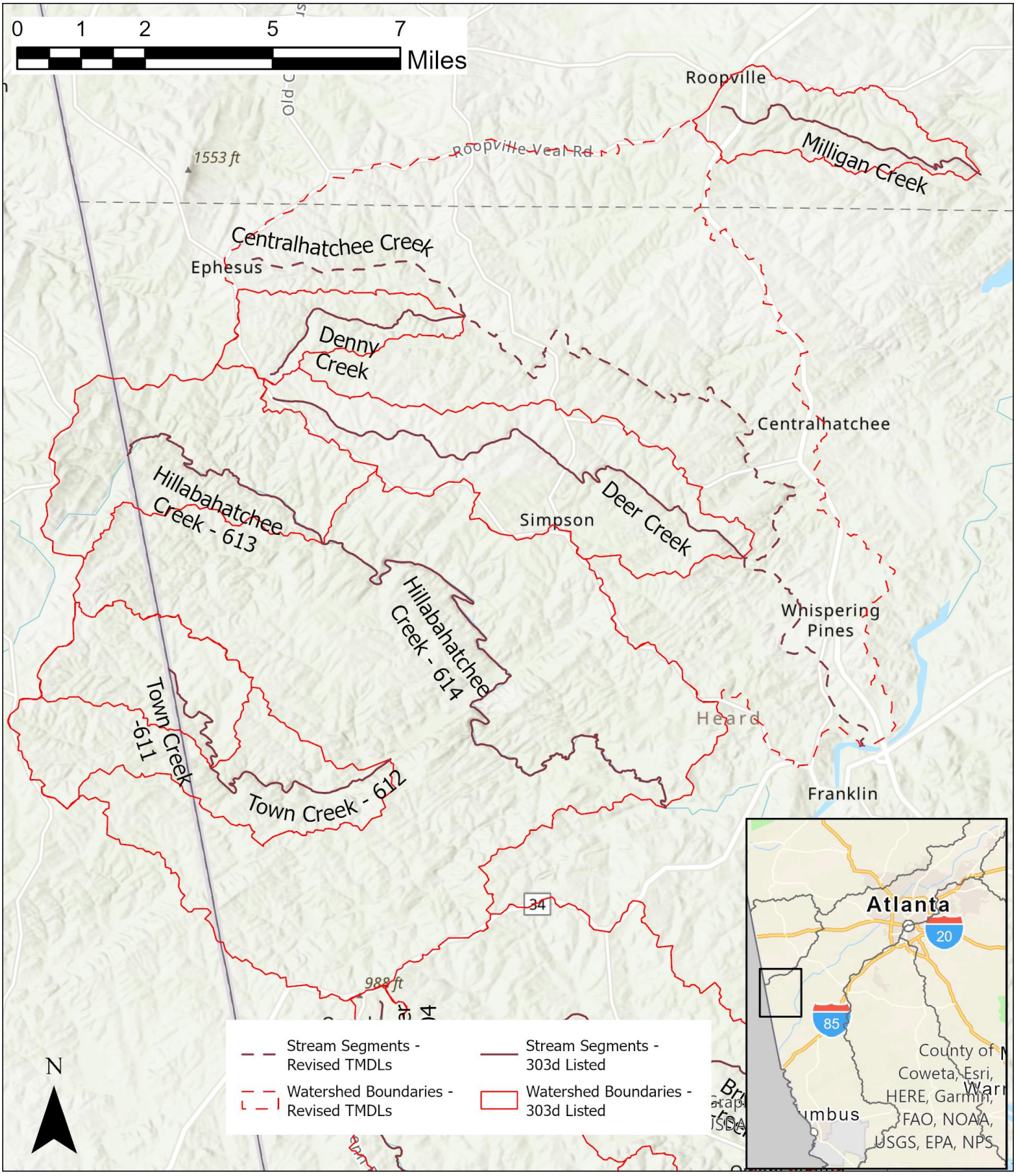

Figure 9: Stream Segments of Centralhatchee Creek, Deer Creek, Denny Creek, Hillabahatchee Creek – upstream, Hillabahatchee Creek – downstream, Town Creek – upstream, and Town Creek - downstream

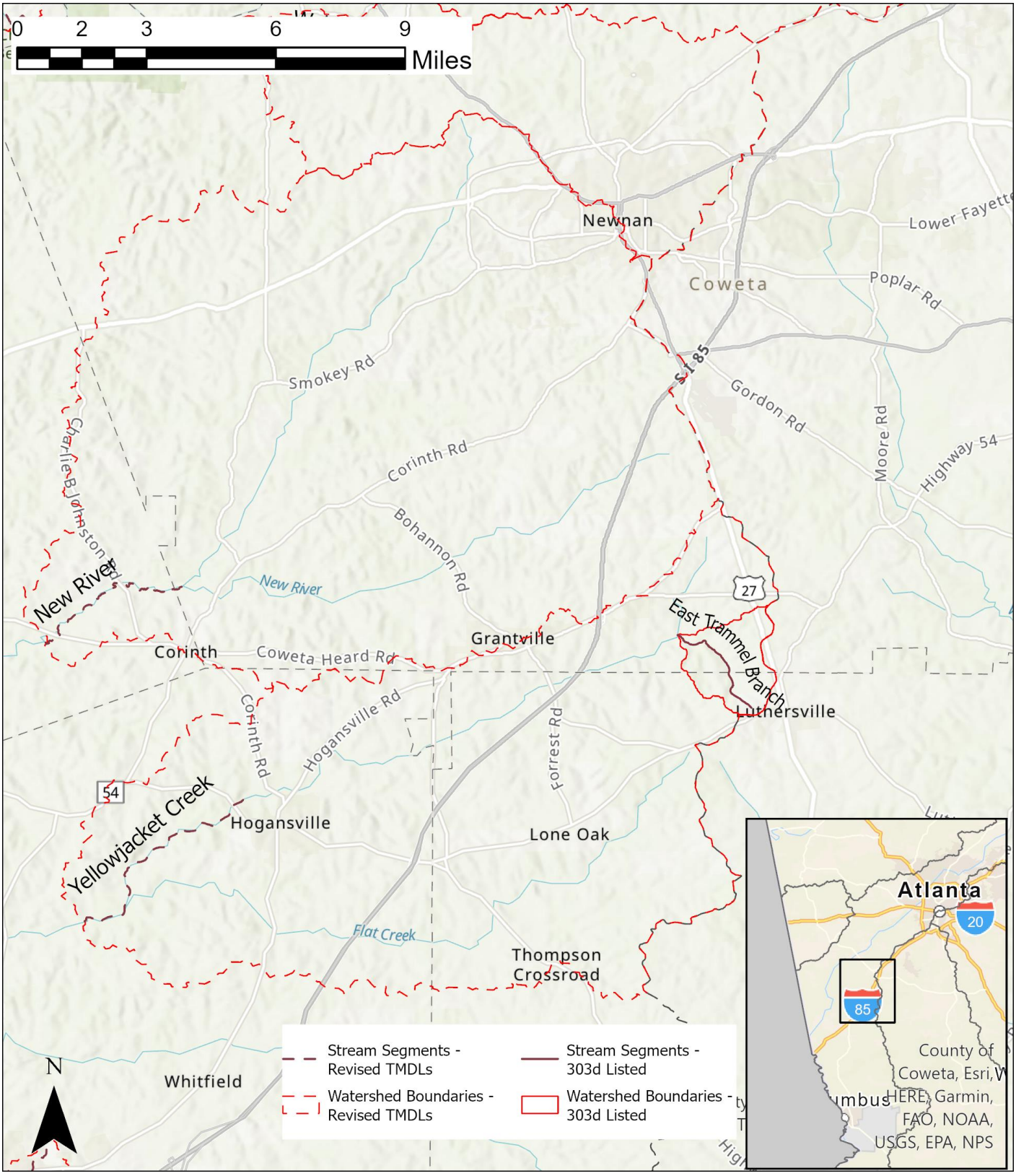

Figure 10: Stream Segments of East Trammel Branch, New River, and Yellowjacket Creek

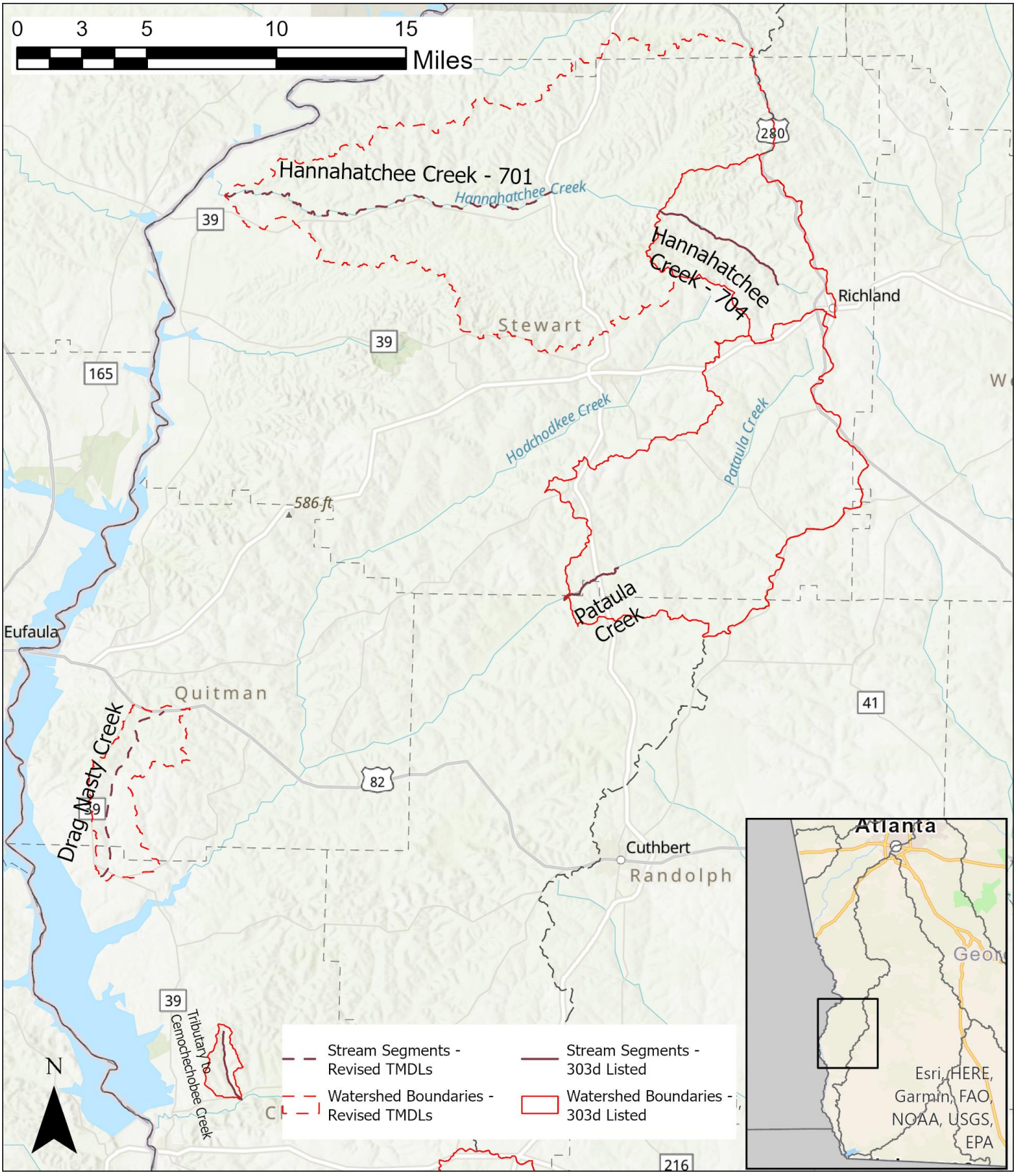

Figure 11: Stream Segments of Drag Nasty Creek, Hannahatchee Creek, Hannahatchee Creek (revised), Pataula Creek, Tributary of Cemochechobee Creek

Figure 12: Stream Segments of Lick Log Creek, Tributary to Lick Log Creek, and Town Branch

Figure 13: Stream Segments of Milligan Creek, Whooping Creek - upstream, and Whooping Creek - downstream

Figure 14: Stream Segments of Acorn Creek, Billy Creek, Snake Creek – upstream, Snake Creek – middle, Snake Creek – downstream, and Wolf Creek

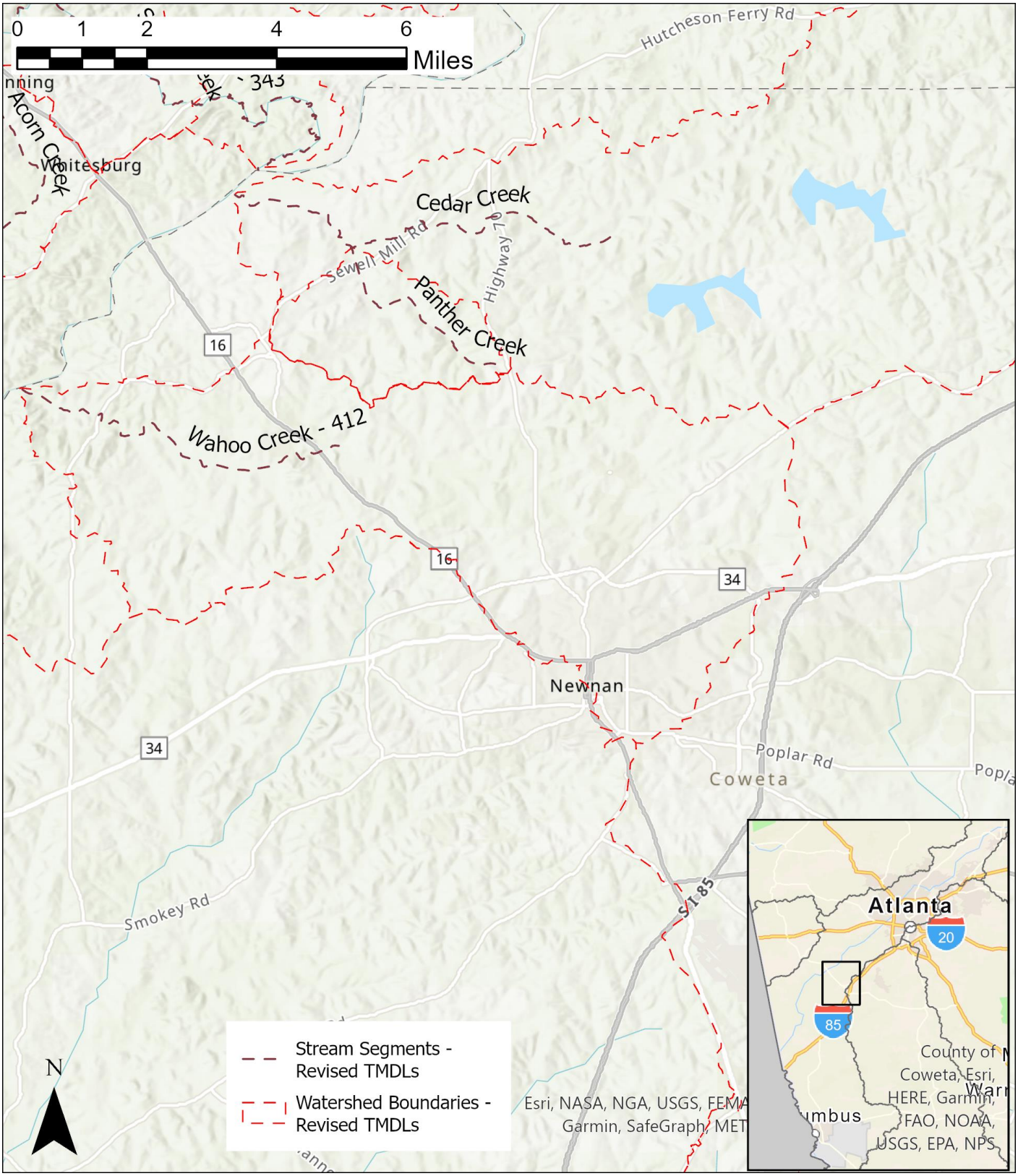

Figure 15: Stream Segments of Cedar Creek, Panther Creek, and Wahoo Creek (Downstream Arnco Mills Lake)

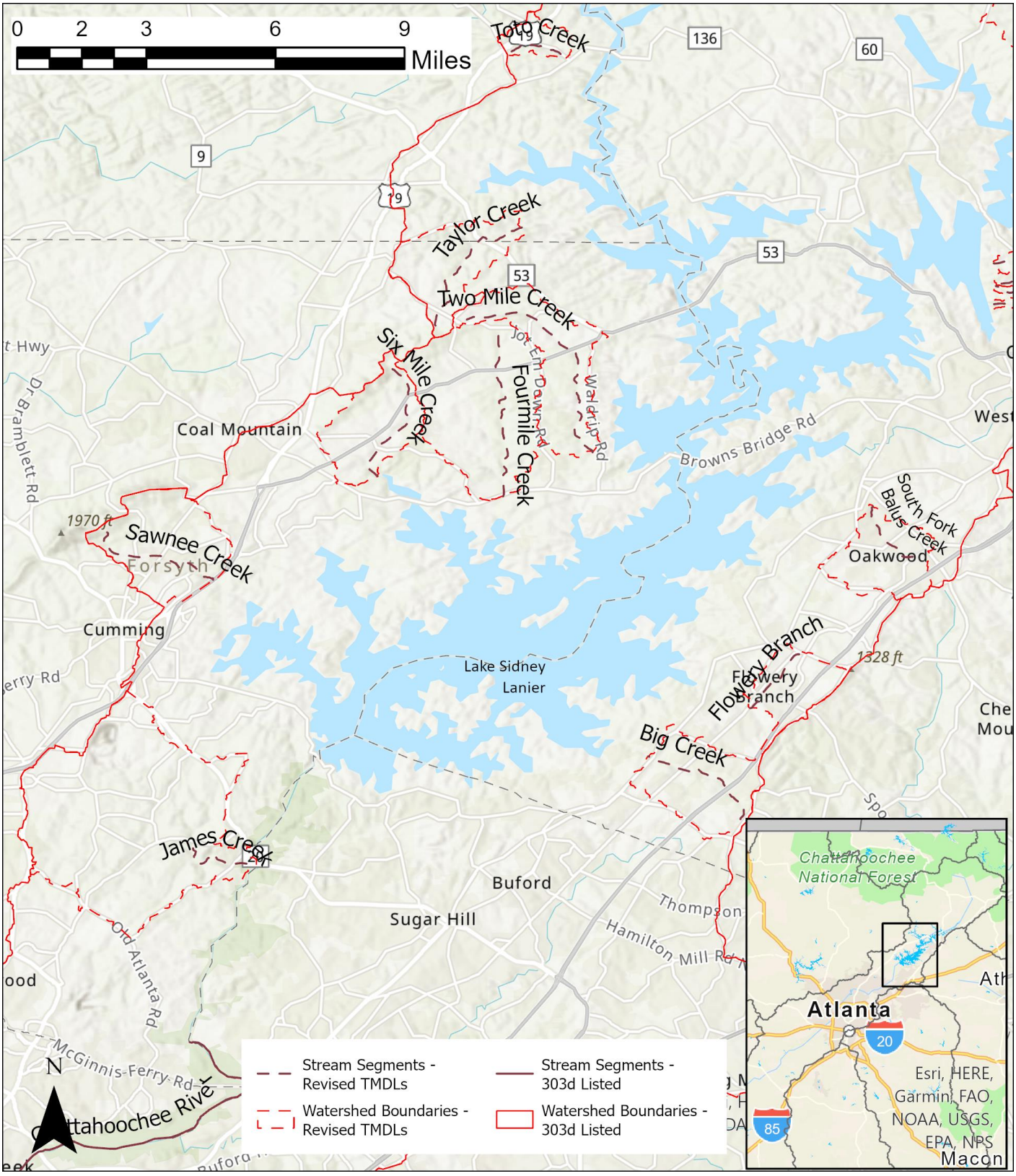

Figure 16: Stream Segments of Big Creek, Flowery Branch, Fourmile Creek, James Creek, Sawnee Creek, Six Mile Creek, South Fork Balus Creek, Taylor Creek, Toto Creek, and Two Mile Creek

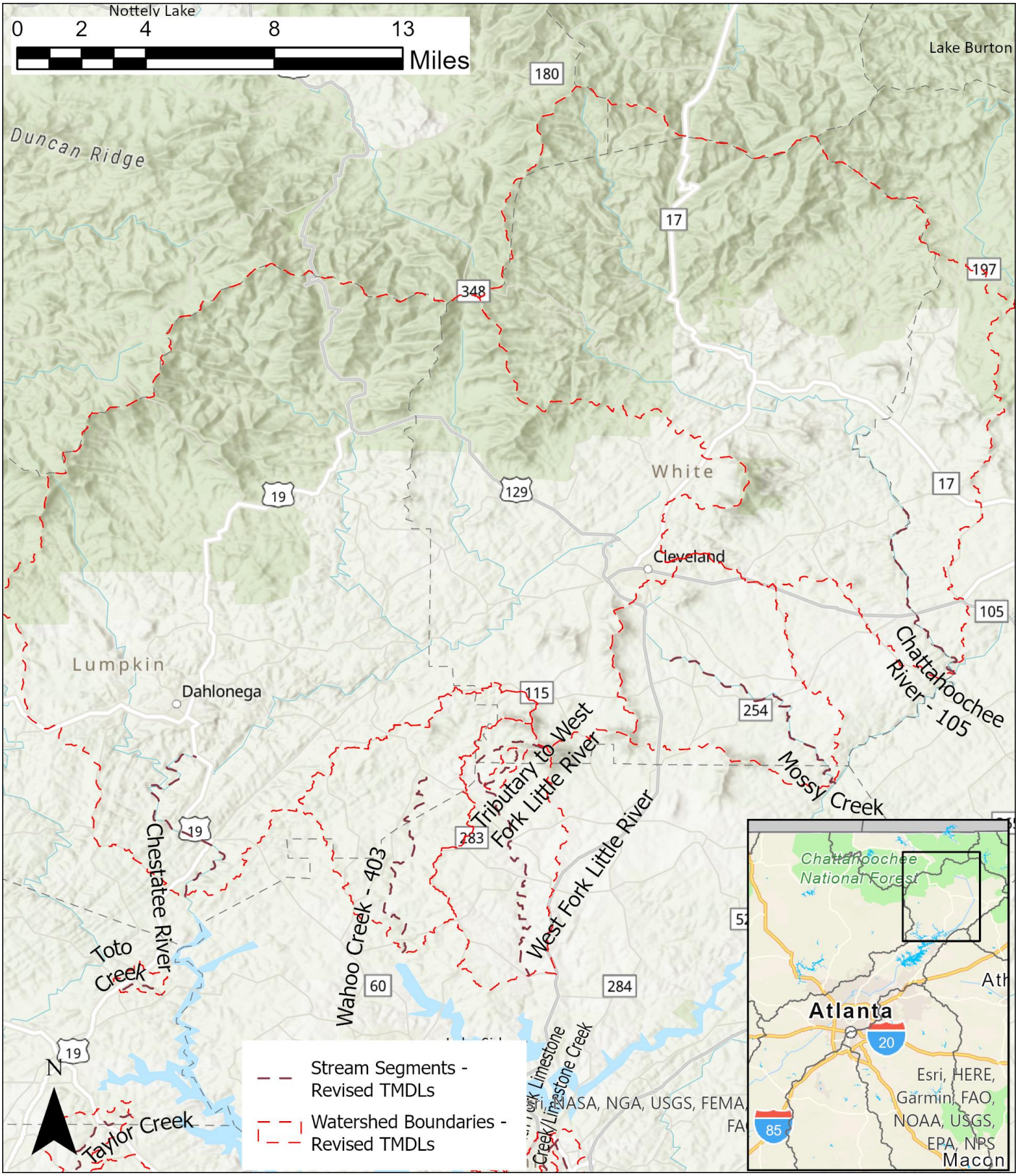

Figure 17: Stream Segments of Chattahoochee River (revised), Chestatee River, Mossy Creek, Tributary to West Fork Little River, and Wahoo Creek (SR 52 to Lake Lanier), and West Fork Little River

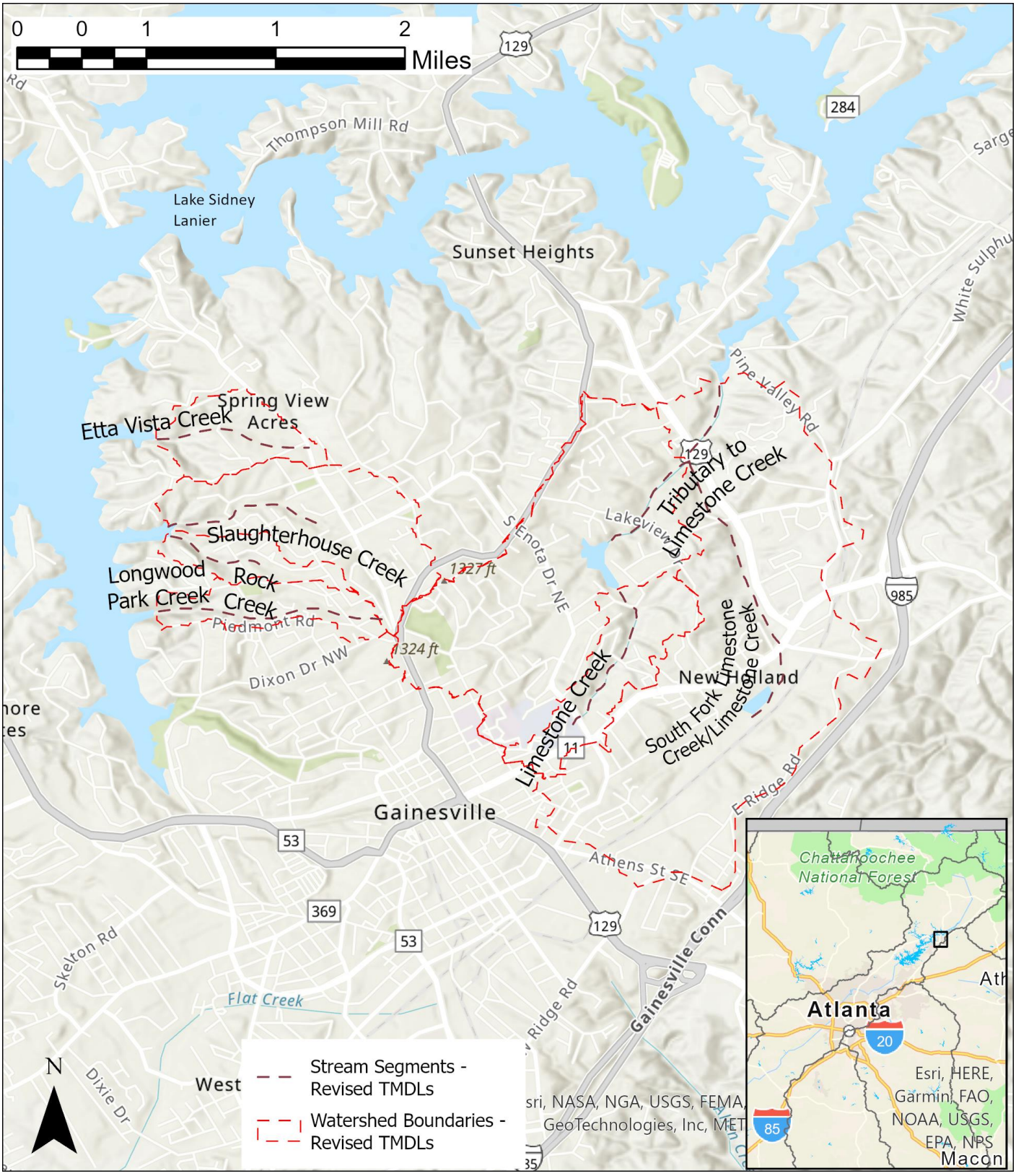

Figure 18: Stream Segments of Etta Vista Creek, Limestone Creek, Longwood Park Creek, Rock Creek, Slaughterhouse Creek, South Fork Limestone Creek, and Tributary to Limestone Creek

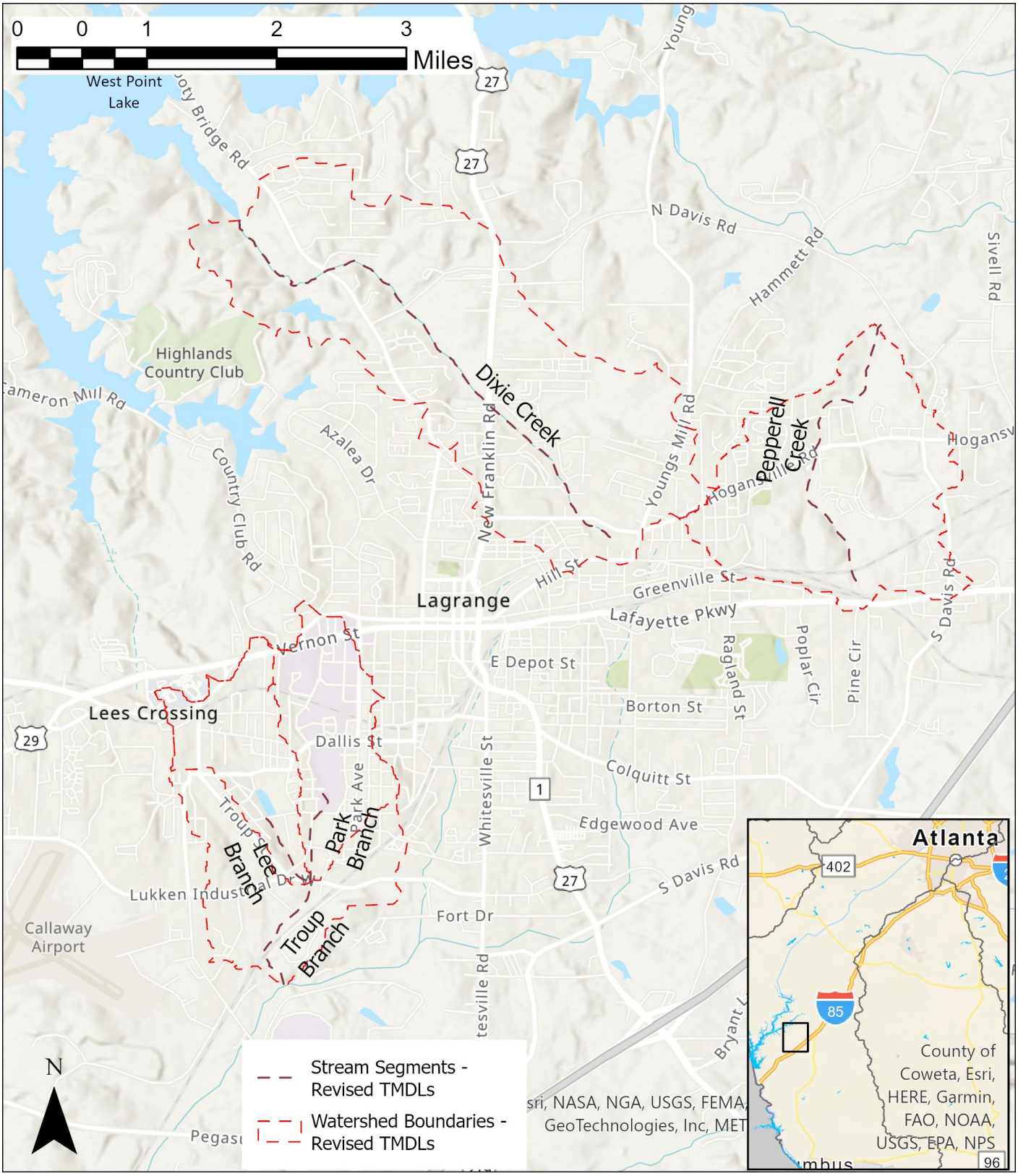

Figure 19: Stream Segments of Dixie Creek, Lee Branch, Park Branch, Pepperell Branch, and Troup Branch

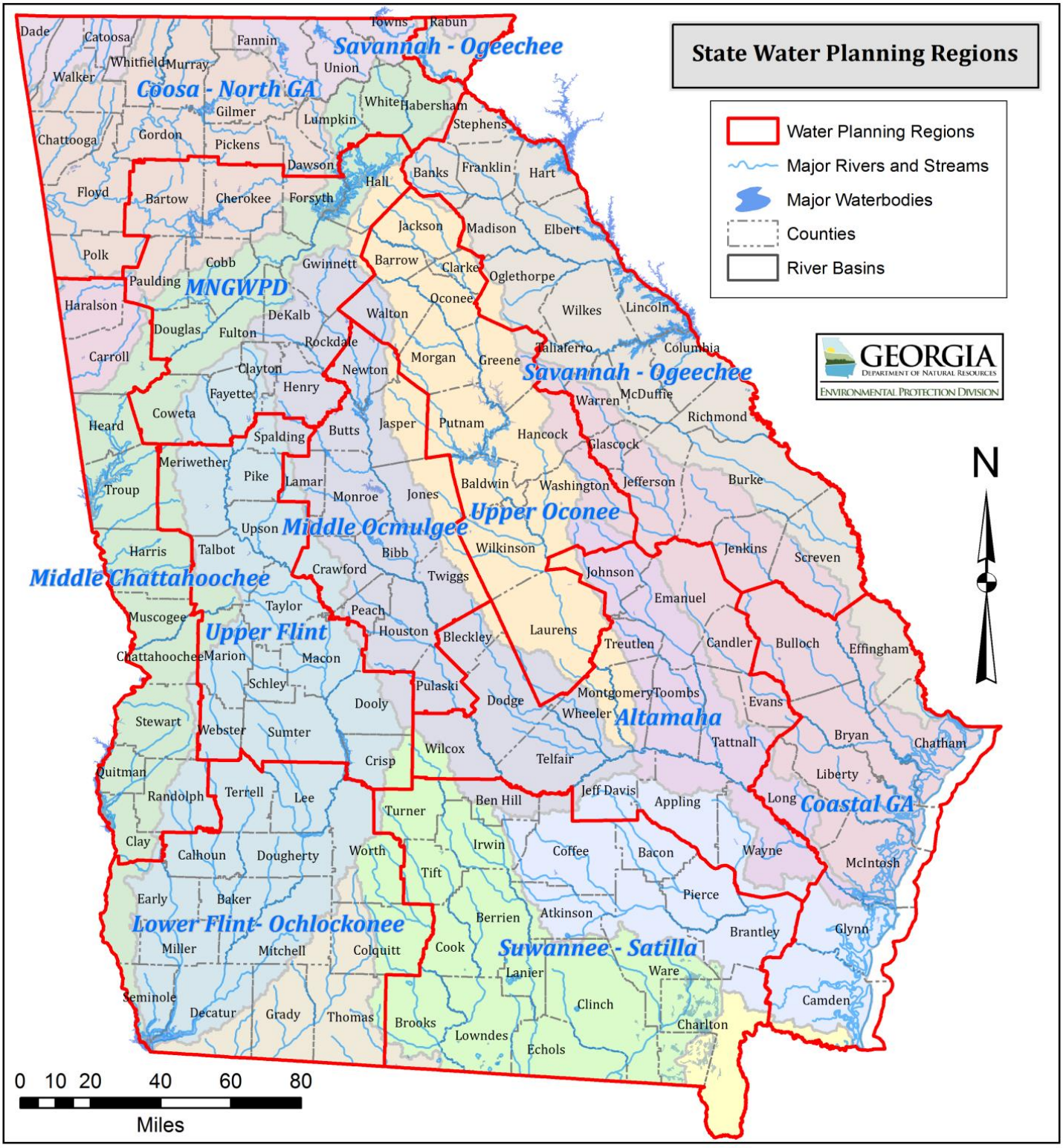

Figure 20: Boundaries of the Regional Water Planning Councils and the Metropolitan North Georgia Water Planning District

The EPA approved water quality criteria in place when these streams were listed are as follows:

(a) Drinking Water Supplies: Those waters approved as a source for public drinking water systems permitted or to be permitted by the Environmental Protection Division. Waters classified for drinking water supplies will also support the fishing use and any other use requiring water of a lower quality.

(i) Bacteria: For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform not to exceed a geometric mean of 200 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 mL (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing freshwater streams. For the months of November through April, fecal coliform not to exceed a geometric mean of 1,000 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 mL for any sample. The State does not encourage swimming in surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of fecal coliform.

(b) Recreation: General recreational activities such as water skiing, boating, and swimming, or for any other use requiring water of a lower quality, such as recreational fishing. These criteria are not to be interpreted as encouraging water contact sports in proximity to sewage or industrial waste discharges regardless of treatment requirements:

(i) Bacteria: Fecal coliform not to exceed the following geometric means based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours:

a. Coastal waters 100 per 100 mL
b. All other recreational waters 200 per 100 mL
c. Should water quality and sanitary studies show natural fecal coliform levels exceed 200/100 mL (geometric mean) occasionally in high quality recreational waters, then the allowable geometric mean fecal coliform level shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing fresh water streams.

(c) Fishing: Propagation of Fish, Shellfish, Game and Other Aquatic Life; primary contact recreation in and on the water for the months of May – October, secondary contact recreation in and on the water for the months of November – April; or for any other use requiring water of a lower quality.

(i) Bacteria: For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform not to exceed a geometric mean of 200 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 mL (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing freshwater streams. For the months of November through April, fecal coliform not to exceed a geometric mean of 1,000 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 mL for any sample. The State does not encourage swimming in surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of fecal coliform. For waters designated as shellfish growing areas by the Georgia DNR Coastal Resources Division, the requirements will be consistent with those established by the State and Federal agencies responsible for the National Shellfish Sanitation Program. The requirements are found in National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish, 2007 Revision (or most recent version), Interstate Shellfish Sanitation Conference, U.S. Food and Drug Administration.

In August 2015, the Georgia DNR Board adopted new bacteria criteria for “Recreation” uses using the bacterial indicators *E. coli* and enterococci. These bacteria are better indicators for human health illnesses. The adopted criteria have the same estimated illness rate (8 per 1000 swimmers) as the previously established fecal coliform criteria. EPA approved these revised criteria on August

16, 2016. In January 2022, the Georgia DNR Board adopted new bacteria criteria for “Fishing” and “Drinking Water” designated uses. EPA approved these proposed revisions to Georgia’s water quality standards on August 31, 2022. The bacteria water quality criteria for "Drinking Water”, “Recreation” and “Fishing” designated uses, as stated in the *State of Georgia’s Rules and Regulations for Water Quality Control*, Chapter 391-3-6-.03(6) (GA EPD, 2022), are as follows:

(a) Drinking Water Supplies: Those waters approved as a source for public drinking water systems permitted or to be permitted by the Environmental Protection Division. Waters classified for drinking water supplies will also support the fishing use and any other use requiring water of a lower quality.

(i) Bacteria:

1. For the months of May through October, when primary water contact recreation activities are expected to occur, culturable E. coli not to exceed a geometric mean of 126 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 410 counts per 100 mL in the same 30-day interval.

2. For the months of November through April, culturable E. coli not to exceed a geometric mean of 265 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 861 counts per 100 mL in the same 30-day interval.

3. The State does not encourage swimming in these surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of bacteria.

(b) Recreation: Primary contact recreational activities that occur year round such as swimming, diving, whitewater boating (class III and above), water skiing, and surfing, or for any other use requiring water of a lower quality, such as recreational fishing. These criteria are not to be interpreted as encouraging water contact sports in proximity to sewage or industrial waste discharges regardless of treatment requirements:

(i) Bacteria:

1. Coastal and estuarine waters: Culturable enterococci not to exceed a geometric mean of 35 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an enterococci statistical threshold value (STV) of 130 counts per 100 mL in the same 30-day interval.

2. All other recreational waters: Culturable E. coli not to exceed a geometric mean of 126 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 410 counts per 100 mL in the same 30-day interval

(c) Fishing: Propagation of Fish, Shellfish, Game and Other Aquatic Life; primary contact recreation in and on the water for the months of May – October, secondary contact recreation in and on the water for the months of November – April; or for any other use requiring water of a lower quality.

(i) Bacteria:

1. Estuarine waters: For the months of May through October, when primary water contact recreation activities are expected to occur, culturable enterococci not to exceed a geometric mean of 35 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an enterococci statistical threshold value (STV) of 130 counts per 100 mL the same 30-day interval.

For the months of November through April, culturable enterococci not to exceed a geometric mean of 74 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an enterococci statistical threshold value (STV) of 273 counts per 100 mL in the same 30-day interval.

2. All other fishing waters: For the months of May through October, when primary water contact recreation activities are expected to occur, culturable E. coli not to exceed a geometric mean of 126 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 410 counts per 100 mL in the same 30-day interval.

   For the months of November through April, culturable E. coli not to exceed a geometric mean of 265 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 861 counts per 100 mL in the same 30-day interval.

3. The State does not encourage swimming in these surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of bacteria.

4. For waters designated as shellfish growing areas by the Georgia DNR Coastal Resources Division, the requirements will be consistent with those established by the State and Federal agencies responsible for the National Shellfish Sanitation Program. The requirements are found in National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish, 2007 Revision (or most recent version), Interstate Shellfish Sanitation Conference, U.S. Food and Drug Administration.

Since this TMDL was written after EPA approved the new bacteria criteria, the TMDL will use both fecal coliform and the appropriate indicator identified above based on estuarine/non-estuarine status. Where fecal coliform and *E. coli* were sampled concurrently, the *E. coli* current load can be determined, and the percentage reduction calculated. For impaired waters where only fecal coliform was sampled, the current *E. coli* or enterococci load cannot be determined. In this case the TMDL will use a conversion factor to convert from fecal coliform criteria to *E. coli* or enterococci criteria*,* based on the respective 30-day geometric mean water quality criteria. For non-estuarine waters, a conversion factor of 0.63 will be used to translate the fecal coliform TMDL to *E. coli*. For estuarine waters, a conversion factor of 0.175 will be used to translate the fecal coliform TMDL to enterococci.

Table 4: Chattahoochee River Basin Land Coverage

Stream Segment and Assessment Unit ID	Land Uses (acres)													
	Beaches, Dunes, Mud	Open Water	Developed, Low Intensity	Developed, Medium Intensity	Developed, High Intensity	Transitional, Clearcut, Sparse	Forest	Row Crops	Pasture, Hay	Other Grasses (Developed Open Space, Utility Swaths, Golf Courses)	Forested Wetlands	Non-Forested Wetlands (Salt/Brackish)	Non-Forested Wetlands (Freshwater)	Total
Anneewakee Creek	14.2	69.4	5184.9	2057.6	1468.9	380.5	6124.8	0.0	614.0	3138.7	255.3	0.0	2.0	19312.1
GAR031300020304	0.1%	0.4%	26.8%	10.7%	7.6%	2.0%	31.7%	0.0%	3.2%	16.3%	1.3%	0.0%	0.0%	100%
Brush Creek	1.8	20.5	320.0	10.9	0.7	1160.9	8584.9	0.0	1363.3	634.5	635.6	0.0	4.2	12841.3
GAR031300020605	0.0%	0.2%	2.5%	0.1%	0.0%	9.0%	66.9%	0.0%	10.6%	4.9%	4.9%	0.0%	0.0%	100%
Chattahoochee River	2409.2	37100.2	63830.9	26138.1	13104.2	16650.7	420330.1	2602.2	90912.0	81787.3	3799.0	0.0	40.0	760307.6
GAR031300010913	0.3%	4.9%	8.4%	3.4%	1.7%	2.2%	55.3%	0.3%	12.0%	10.8%	0.5%	0.0%	0.0%	100%
Coheelee Creek	1.6	18.2	76.9	14.2	7.6	290.2	5546.8	4360.3	1076.4	411.4	1736.5	2.7	6.9	13549.6
GAR031300040502	0.0%	0.1%	0.6%	0.1%	0.1%	2.1%	40.9%	32.2%	7.9%	3.0%	12.8%	0.0%	0.1%	100%
Cooper Creek	7.6	40.3	2222.2	1617.3	604.7	45.4	772.4	51.8	51.6	957.4	11.1	0.0	1.8	6383.4
GAR031300030107	0.1%	0.6%	34.8%	25.3%	9.5%	0.7%	12.1%	0.8%	0.8%	15.0%	0.2%	0.0%	0.0%	100%
Crawford Creek	2.0	111.4	292.0	34.5	12.5	564.9	8658.9	57.4	1238.3	720.6	691.9	0.0	1.8	12386.1
GAR031300021010	0.0%	0.9%	2.4%	0.3%	0.1%	4.6%	69.9%	0.5%	10.0%	5.8%	5.6%	0.0%	0.0%	100%
Deer Creek	0.7	6.4	258.9	19.3	8.0	510.4	3719.1	17.1	2369.0	406.1	3.1	0.0	0.0	7318.1
GAR031300020422	0.0%	0.1%	3.5%	0.3%	0.1%	7.0%	50.8%	0.2%	32.4%	5.5%	0.0%	0.0%	0.0%	100%
Denny Creek	0.0	1.6	49.6	13.6	3.6	35.8	1652.6	36.5	340.3	104.7	0.9	0.0	0.0	2239.1
GAR031300020433	0.0%	0.1%	2.2%	0.6%	0.2%	1.6%	73.8%	1.6%	15.2%	4.7%	0.0%	0.0%	0.0%	100%

Stream Segment and Assessment Unit ID	Land Uses (acres)													
	Beaches, Dunes, Mud	Open Water	Developed, Low Intensity	Developed, Medium Intensity	Developed, High Intensity	Transitional, Clearcut, Sparse	Forest	Row Crops	Pasture, Hay	Other Grasses (Developed Open Space, Utility Swaths, Golf Courses)	Forested Wetlands	Non-Forested Wetlands (Salt/Brackish)	Non-Forested Wetlands (Freshwater)	Total
Dozier Creek	2.9	14.2	481.3	237.3	8.2	107.2	3425.3	162.6	44.9	410.1	594.0	0.0	4.7	5492.7
GAR031300030311	0.1%	0.3%	8.8%	4.3%	0.1%	2.0%	62.4%	3.0%	0.8%	7.5%	10.8%	0.0%	0.1%	100%
East Trammel Branch	3.3	12.2	30.7	5.6	2.2	93.6	1183.1	97.9	407.7	95.9	41.1	0.0	0.0	1973.3
GAR031300020716	0.2%	0.6%	1.6%	0.3%	0.1%	4.7%	60.0%	5.0%	20.7%	4.9%	2.1%	0.0%	0.0%	100%
Flatrock Creek	3.8	129.2	853.3	728.3	245.3	96.7	2650.7	68.7	381.9	569.6	257.5	0.0	2.4	6010.9
GAR031300030110	0.1%	2.1%	14.2%	12.1%	4.1%	1.6%	44.1%	1.1%	6.4%	9.5%	4.3%	0.0%	0.0%	100%
Fort Creek	2.0	8.5	56.5	7.8	8.9	42.9	1561.2	0.0	290.7	146.1	72.1	0.0	0.9	2197.5
GAR031300021216	0.1%	0.4%	2.6%	0.4%	0.4%	2.0%	71.0%	0.0%	13.2%	6.6%	3.3%	0.0%	0.0%	100%
Glade Branch	0.0	3.3	18.0	1.6	0.0	6.0	485.3	7.3	245.3	77.4	0.0	0.0	0.0	844.2
GAR031300010514	0.0%	0.4%	2.1%	0.2%	0.0%	0.7%	57.5%	0.9%	29.1%	9.2%	0.0%	0.0%	0.0%	100%
Hannahatchee Creek	0.0	0.9	112.1	22.5	9.6	416.3	14145.0	441.5	436.1	299.8	886.2	0.4	0.0	16770.4
GAR031300030704	0.0%	0.0%	0.7%	0.1%	0.1%	2.5%	84.3%	2.6%	2.6%	1.8%	5.3%	0.0%	0.0%	100%
Hillabahatchee Creek	0.0	8.7	83.0	8.2	2.0	234.8	5350.4	1.6	626.5	160.3	2.4	0.0	0.0	6477.9
GAR031300020613	0.0%	0.1%	1.3%	0.1%	0.0%	3.6%	82.6%	0.0%	9.7%	2.5%	0.0%	0.0%	0.0%	100%
Hillabahatchee Creek	3.3	68.5	685.6	30.7	12.7	3063.3	33978.4	8.9	4220.6	1806.1	474.4	0.0	11.1	44363.6
GAR031300020614	0.0%	0.2%	1.5%	0.1%	0.0%	6.9%	76.6%	0.0%	9.5%	4.1%	1.1%	0.0%	0.0%	100%

Stream Segment and Assessment Unit ID	Land Uses (acres)													
	Beaches, Dunes, Mud	Open Water	Developed, Low Intensity	Developed, Medium Intensity	Developed, High Intensity	Transitional, Clearcut, Sparse	Forest	Row Crops	Pasture, Hay	Other Grasses (Developed Open Space, Utility Swaths, Golf Courses)	Forested Wetlands	Non-Forested Wetlands (Salt/Brackish)	Non-Forested Wetlands (Freshwater)	Total
House Creek	6.4	159.7	631.4	48.9	6.9	1090.8	12061.8	75.4	3482.9	955.9	1208.9	0.0	4.0	19733.1
GAR031300021015	0.0%	0.8%	3.2%	0.2%	0.0%	5.5%	61.1%	0.4%	17.7%	4.8%	6.1%	0.0%	0.0%	100%
Lick Log Creek	12.2	158.6	2536.2	229.3	67.8	523.7	5577.0	0.2	2132.1	1897.7	771.9	0.0	11.3	13918.1
GAR031300020218	0.1%	1.1%	18.2%	1.6%	0.5%	3.8%	40.1%	0.0%	15.3%	13.6%	5.5%	0.0%	0.1%	100%
Milligan Creek	0.0	2.2	125.2	33.8	9.1	126.8	1748.0	11.8	651.2	195.5	2.4	0.0	0.0	2906.0
GAR031300020428	0.0%	0.1%	4.3%	1.2%	0.3%	4.4%	60.2%	0.4%	22.4%	6.7%	0.1%	0.0%	0.0%	100%
North Prong Kolomoki Creek	7.8	16.7	138.8	6.2	1.1	492.6	8619.8	3773.8	1366.4	532.6	875.8	5.1	28.2	15865.0
GAR031300040205	0.0%	0.1%	0.9%	0.0%	0.0%	3.1%	54.3%	23.8%	8.6%	3.4%	5.5%	0.0%	0.2%	100%
Pataula Creek	9.1	186.4	161.7	28.7	3.3	1917.7	33803.6	4105.2	2245.3	1049.3	3952.4	1.8	2.9	47467.3
GAR031300031507	0.0%	0.4%	0.3%	0.1%	0.0%	4.0%	71.2%	8.6%	4.7%	2.2%	8.3%	0.0%	0.0%	100%
Sand Creek	1.1	23.8	98.1	2.7	0.0	383.2	3824.5	1.3	657.4	217.1	171.2	0.0	0.0	5380.4
GAR031300021018	0.0%	0.4%	1.8%	0.0%	0.0%	7.1%	71.1%	0.0%	12.2%	4.0%	3.2%	0.0%	0.0%	100%
Standing Boy Creek	13.3	133.4	850.9	64.3	21.3	489.3	11061.3	0.0	1617.0	1267.4	730.6	0.0	19.6	16268.4
GAR031300021308	0.1%	0.8%	5.2%	0.4%	0.1%	3.0%	68.0%	0.0%	9.9%	7.8%	4.5%	0.0%	0.1%	100%
Tar River	1.8	21.8	66.5	19.1	29.6	369.4	1220.9	40.7	72.1	107.2	38.5	0.0	0.0	1987.5
GAR031300030204	0.1%	1.1%	3.3%	1.0%	1.5%	18.6%	61.4%	2.0%	3.6%	5.4%	1.9%	0.0%	0.0%	100%
Tate Creek	0.0	17.8	12.7	8.2	3.8	22.5	2622.3	0.0	288.9	386.5	4.4	0.0	0.0	3367.1
GAR031300010512	0.0%	0.5%	0.4%	0.2%	0.1%	0.7%	77.9%	0.0%	8.6%	11.5%	0.1%	0.0%	0.0%	100%

Stream Segment and Assessment Unit ID	Land Uses (acres)													
	Beaches, Dunes, Mud	Open Water	Developed, Low Intensity	Developed, Medium Intensity	Developed, High Intensity	Transitional, Clearcut, Sparse	Forest	Row Crops	Pasture, Hay	Other Grasses (Developed Open Space, Utility Swaths, Golf Courses)	Forested Wetlands	Non-Forested Wetlands (Salt/Brackish)	Non-Forested Wetlands (Freshwater)	Total
Town Branch	7.6	70.3	601.1	295.1	87.4	216.8	1548.3	0.7	154.6	558.9	176.1	0.0	0.0	3716.9
GAR031300020211	0.2%	1.9%	16.2%	7.9%	2.4%	5.8%	41.7%	0.0%	4.2%	15.0%	4.7%	0.0%	0.0%	100%
Town Creek	1.6	5.8	55.4	5.1	3.1	91.8	2251.5	2.4	577.1	170.6	6.0	0.0	0.0	3170.5
GAR031300020611	0.0%	0.2%	1.7%	0.2%	0.1%	2.9%	71.0%	0.1%	18.2%	5.4%	0.2%	0.0%	0.0%	100%
Town Creek	2.4	5.8	118.3	9.8	3.8	226.2	6247.3	2.4	890.2	396.1	42.9	0.0	3.6	7948.8
GAR031300020612	0.0%	0.1%	1.5%	0.1%	0.0%	2.8%	78.6%	0.0%	11.2%	5.0%	0.5%	0.0%	0.0%	100%
Tributary to Bull Creek	0.0	0.0	489.5	67.6	44.5	8.7	68.7	0.0	18.2	115.9	0.4	0.2	0.0	813.7
GAR031300030121	0.0%	0.0%	60.2%	8.3%	5.5%	1.1%	8.4%	0.0%	2.2%	14.2%	0.1%	0.0%	0.0%	100%
Tributary to Cemochechobee Creek	0.0	0.0	3.1	0.0	0.0	62.5	1317.9	7.3	51.4	28.5	35.4	0.0	0.0	1506.1
GAR031300040107	0.0%	0.0%	0.2%	0.0%	0.0%	4.1%	87.5%	0.5%	3.4%	1.9%	2.3%	0.0%	0.0%	100%
Tributary to Lick Log Creek	0.2	2.2	78.1	7.1	0.0	39.8	333.8	0.0	79.2	60.9	13.3	0.0	0.0	614.7
GAR031300020224	0.0%	0.4%	12.7%	1.2%	0.0%	6.5%	54.3%	0.0%	12.9%	9.9%	2.2%	0.0%	0.0%	100%
Tributary to Mountain Creek	2.2	45.4	47.1	35.1	17.6	17.8	264.9	0.2	15.1	349.4	2.9	0.0	0.0	797.7
GAR031300021103	0.3%	5.7%	5.9%	4.4%	2.2%	2.2%	33.2%	0.0%	1.9%	43.8%	0.4%	0.0%	0.0%	100%
Tributary to Mulberry Creek	1.1	9.1	66.9	4.9	2.2	147.0	1000.1	0.0	76.1	120.8	67.6	0.0	0.0	1495.8
GAR031300021219	0.1%	0.6%	4.5%	0.3%	0.1%	9.8%	66.9%	0.0%	5.1%	8.1%	4.5%	0.0%	0.0%	100%

Stream Segment and Assessment Unit ID	Land Uses (acres)													
	Beaches, Dunes, Mud	Open Water	Developed, Low Intensity	Developed, Medium Intensity	Developed, High Intensity	Transitional, Clearcut, Sparse	Forest	Row Crops	Pasture, Hay	Other Grasses (Developed Open Space, Utility Swaths, Golf Courses)	Forested Wetlands	Non-Forested Wetlands (Salt/Brackish)	Non-Forested Wetlands (Freshwater)	Total
Tributary to Mulberry Creek	0.0	0.0	10.0	1.8	2.0	6.0	6.9	0.0	3.3	11.6	0.0	0.0	0.0	41.6
GAR031300021220	0.0%	0.0%	24.1%	4.3%	4.8%	14.4%	16.6%	0.0%	8.0%	27.8%	0.0%	0.0%	0.0%	100%
White Sulfur Creek	8.5	58.3	318.7	52.7	32.5	959.2	11072.4	303.8	2004.0	755.7	1444.5	0.0	24.7	17034.8
GAR031300021006	0.0%	0.3%	1.9%	0.3%	0.2%	5.6%	65.0%	1.8%	11.8%	4.4%	8.5%	0.0%	0.1%	100%
Whitewater Creek	0.0	12.0	160.8	1.1	0.9	1192.7	4619.8	0.0	420.5	214.4	517.5	0.0	0.9	7159.8
GAR031300020804	0.0%	0.2%	2.2%	0.0%	0.0%	16.7%	64.5%	0.0%	5.9%	3.0%	7.2%	0.0%	0.0%	100%
Whitewater Creek	0.0	18.0	224.8	2.9	0.9	1770.5	10098.1	0.0	574.7	403.0	1122.9	0.0	0.9	14235.7
GAR031300020805	0.0%	0.1%	1.6%	0.0%	0.0%	12.4%	70.9%	0.0%	4.0%	2.8%	7.9%	0.0%	0.0%	100%
Revised TMDLs														
Acorn Creek	0.9	2.2	212.2	38.0	11.6	292.7	5741.1	0.0	467.7	441.5	102.3	0.0	0.0	7310.1
GAR031300020401	0.0%	0.0%	2.9%	0.5%	0.2%	4.0%	78.5%	0.0%	6.4%	6.0%	1.4%	0.0%	0.0%	100%
Baldwin Creek	0.0	0.0	310.0	28.0	11.3	23.6	853.3	0.0	57.2	254.6	0.4	0.0	0.0	1538.5
GAR031300020308	0.0%	0.0%	20.2%	1.8%	0.7%	1.5%	55.5%	0.0%	3.7%	16.6%	0.0%	0.0%	0.0%	100%
Bear Creek	0.4	22.7	940.5	147.7	51.8	59.2	1778.9	0.0	166.4	727.5	0.2	0.0	0.0	3895.2
GAR031300020313	0.0%	0.6%	24.1%	3.8%	1.3%	1.5%	45.7%	0.0%	4.3%	18.7%	0.0%	0.0%	0.0%	100%
Big Creek	0.0	0.0	655.8	266.0	118.3	65.2	782.8	0.0	270.2	310.2	15.6	0.0	0.0	2484.2
GAR031300010813	0.0%	0.0%	26.4%	10.7%	4.8%	2.6%	31.5%	0.0%	10.9%	12.5%	0.6%	0.0%	0.0%	100%
Billy Creek (Previously Nancy Long Crk/Billy Crk)	0.0	12.7	105.2	7.6	1.1	123.4	1823.9	0.0	326.9	149.9	0.0	0.0	0.0	2550.6
GAR031300020310	0.0%	0.5%	4.1%	0.3%	0.0%	4.8%	71.5%	0.0%	12.8%	5.9%	0.0%	0.0%	0.0%	100%

Stream Segment and Assessment Unit ID	Land Uses (acres)													
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Cedar Creek	14.9	803.7	2216.4	164.6	31.4	1314.4	20616.0	14.7	3641.3	2713.4	1822.5	0.0	31.4	33398.4
GAR031300020420	0.0%	2.4%	6.6%	0.5%	0.1%	3.9%	61.7%	0.0%	10.9%	8.1%	5.5%	0.0%	0.1%	100%
Centralhatchee Creek	4.7	57.2	1188.3	245.3	76.7	1567.0	23738.2	164.6	8987.6	1914.4	91.8	0.0	0.0	38035.8
GAR031300020421	0.0%	0.2%	3.1%	0.6%	0.2%	4.1%	62.4%	0.4%	23.6%	5.0%	0.2%	0.0%	0.0%	100%
Chattahoochee River	12.2	336.3	1523.4	300.2	88.7	1442.5	81207.3	176.4	6171.2	8015.1	245.7	0.0	4.0	99604.0
GAR031300010105	0.0%	0.3%	1.5%	0.3%	0.1%	1.4%	81.5%	0.2%	6.2%	8.0%	0.2%	0.0%	0.0%	100%
Chestatee River	5.6	373.8	3245.0	929.4	473.7	1963.5	116643.5	228.2	12523.1	13269.2	334.7	0.0	0.0	150390.2
GAR031300010704	0.0%	0.2%	2.2%	0.6%	0.3%	1.3%	77.6%	0.2%	8.3%	8.8%	0.2%	0.0%	0.0%	100%
Dixie Creek	0.0	8.9	548.9	172.4	184.1	68.7	738.8	0.0	145.0	341.6	33.6	0.0	0.0	2242.0
GAR031300020709	0.0%	0.4%	24.5%	7.7%	8.2%	3.1%	33.0%	0.0%	6.5%	15.2%	1.5%	0.0%	0.0%	100%
Drag Nasty Creek	2.7	14.9	51.8	6.4	0.0	150.8	5051.0	1297.2	763.9	233.5	526.2	1.3	0.2	8100.1
GAR031300031301	0.0%	0.2%	0.6%	0.1%	0.0%	1.9%	62.4%	16.0%	9.4%	2.9%	6.5%	0.0%	0.0%	100%
Etta Vista Creek	0.0	0.0	18.9	9.8	0.7	2.9	81.8	0.0	0.0	44.5	0.0	0.0	0.0	158.6
GAR031300010817	0.0%	0.0%	11.9%	6.2%	0.4%	1.8%	51.6%	0.0%	0.0%	28.1%	0.0%	0.0%	0.0%	100%
Flat Shoals Creek	74.7	727.7	3351.9	299.3	122.8	8338.5	79155.7	716.8	24211.5	6340.7	7911.9	0.0	83.8	131338.7
GAR031300021019	0.1%	0.6%	2.6%	0.2%	0.1%	6.3%	60.3%	0.5%	18.4%	4.8%	6.0%	0.0%	0.1%	100%
Flat Shoals Creek	81.2	743.2	3600.8	337.4	154.1	9069.5	87033.2	716.3	25052.8	6686.3	8111.6	0.0	85.0	141674.7
GAR031300021020	0.1%	0.5%	2.5%	0.2%	0.1%	6.4%	61.4%	0.5%	17.7%	4.7%	5.7%	0.0%	0.1%	100%

Stream Segment and Assessment Unit ID	Land Uses (acres)													
	Beaches, Dunes, Mud	Open Water	Developed, Low Intensity	Developed, Medium Intensity	Developed, High Intensity	Transitional, Clearcut, Sparse	Forest	Row Crops	Pasture, Hay	Other Grasses (Developed Open Space, Utility Swaths, Golf Courses)	Forested Wetlands	Non-Forested Wetlands (Salt/Brackish)	Non-Forested Wetlands (Freshwater)	Total
Flowery Branch	0.0	1.1	331.6	271.3	168.8	31.4	358.9	0.0	108.8	132.8	3.8	0.0	0.0	1408.4
GAR031300010812	0.0%	0.1%	23.5%	19.3%	12.0%	2.2%	25.5%	0.0%	7.7%	9.4%	0.3%	0.0%	0.0%	100%
Fourmile Creek	4.2	0.9	368.7	54.5	12.9	126.3	2018.9	0.2	1808.7	644.5	36.9	0.0	0.0	5102.4
GAR031300010809	0.1%	0.0%	7.2%	1.1%	0.3%	2.5%	39.6%	0.0%	35.4%	12.6%	0.7%	0.0%	0.0%	100%
Hannahatchee Creek	3.1	81.4	452.4	99.0	17.6	1707.8	79333.6	1212.9	1648.8	2131.0	5501.6	23.1	12.7	92225.0
GAR031300030701	0.0%	0.1%	0.5%	0.1%	0.0%	1.9%	86.0%	1.3%	1.8%	2.3%	6.0%	0.0%	0.0%	100%
House Creek	2.9	2.2	259.1	150.6	364.5	6.4	164.6	0.0	63.4	148.3	1.6	0.0	0.0	1163.6
GAR031300020334	0.2%	0.2%	22.3%	12.9%	31.3%	0.6%	14.1%	0.0%	5.4%	12.7%	0.1%	0.0%	0.0%	100%
James Creek	6.0	34.9	2569.8	1347.3	373.6	181.5	2971.6	0.0	443.5	1462.2	24.7	0.0	0.0	9697.1
GAR031300010902	0.1%	0.4%	26.5%	13.9%	3.9%	1.9%	30.6%	0.0%	4.6%	15.1%	0.3%	0.0%	0.0%	100%
Lee Branch	0.7	1.3	148.8	55.4	55.8	12.7	38.7	0.0	15.8	73.4	7.8	0.0	0.0	410.3
GAR031300020908	0.2%	0.3%	36.3%	13.5%	13.6%	3.1%	9.4%	0.0%	3.8%	17.9%	1.9%	0.0%	0.0%	100%
Limestone Creek	0.0	0.0	40.0	30.0	40.9	5.3	83.4	0.0	2.7	21.1	0.0	0.0	0.0	223.5
GAR031300010301	0.0%	0.0%	17.9%	13.4%	18.3%	2.4%	37.3%	0.0%	1.2%	9.5%	0.0%	0.0%	0.0%	100%
Little Bear Creek	0.4	32.7	967.0	216.4	50.0	121.7	3663.1	0.0	174.4	1008.1	22.9	0.0	0.0	6256.6
GAR031300020305	0.0%	0.5%	15.5%	3.5%	0.8%	1.9%	58.5%	0.0%	2.8%	16.1%	0.4%	0.0%	0.0%	100%
Longwood Park Creek	0.0	0.0	43.6	8.7	2.4	2.7	39.6	0.0	2.7	40.3	0.0	0.0	0.0	139.9
GAR031300010816	0.0%	0.0%	31.2%	6.2%	1.7%	1.9%	28.3%	0.0%	1.9%	28.8%	0.0%	0.0%	0.0%	100%

Stream Segment and Assessment Unit ID	Land Uses (acres)													
	Beaches, Dunes, Mud	Open Water	Developed, Low Intensity	Developed, Medium Intensity	Developed, High Intensity	Transitional, Clearcut, Sparse	Forest	Row Crops	Pasture, Hay	Other Grasses (Developed Open Space, Utility Swaths, Golf Courses)	Forested Wetlands	Non-Forested Wetlands (Salt/Brackish)	Non-Forested Wetlands (Freshwater)	Total
Mossy Creek	10.7	30.7	1059.3	315.4	181.7	576.4	9492.9	501.1	5111.1	1890.4	36.3	0.0	0.2	19206.0
GAR031300010303	0.1%	0.2%	5.5%	1.6%	0.9%	3.0%	49.4%	2.6%	26.6%	9.8%	0.2%	0.0%	0.0%	100%
New River	50.7	1057.3	4017.8	687.6	553.3	3830.8	47226.0	5.3	11869.9	4734.6	6201.5	0.0	13.3	80331.5
GAR031300020508	0.1%	1.3%	5.0%	0.9%	0.7%	4.8%	58.8%	0.0%	14.8%	5.9%	7.7%	0.0%	0.0%	100%
Panther Creek	0.2	14.9	139.2	2.4	1.1	60.3	2073.6	0.0	300.0	209.9	174.6	0.0	0.9	2977.2
GAR031300020408	0.0%	0.5%	4.7%	0.1%	0.0%	2.0%	69.6%	0.0%	10.1%	7.1%	5.9%	0.0%	0.0%	100%
Park Branch	1.6	1.1	242.0	98.1	47.4	2.2	11.1	0.2	23.1	59.2	0.9	0.0	0.0	486.8
GAR031300020907	0.3%	0.2%	49.7%	20.1%	9.7%	0.5%	2.3%	0.0%	4.8%	12.2%	0.2%	0.0%	0.0%	100%
Rock Creek	0.0	0.2	29.1	0.0	0.0	0.2	31.8	0.0	0.0	38.3	0.0	0.0	0.0	99.6
GAR031300010814	0.0%	0.2%	29.2%	0.0%	0.0%	0.2%	31.9%	0.0%	0.0%	38.4%	0.0%	0.0%	0.0%	100%
Sawnee Creek	0.2	3.3	525.1	186.8	71.4	98.7	1292.1	0.0	366.7	429.2	10.0	0.0	0.0	2983.7
GAR031300010804	0.0%	0.1%	17.6%	6.3%	2.4%	3.3%	43.3%	0.0%	12.3%	14.4%	0.3%	0.0%	0.0%	100%
Six Mile Creek	14.9	10.7	171.5	79.0	66.1	91.0	764.8	0.0	707.4	191.3	0.2	0.0	0.0	2188.6
GAR031300010805	0.7%	0.5%	7.8%	3.6%	3.0%	4.2%	34.9%	0.0%	32.3%	8.7%	0.0%	0.0%	0.0%	100%
Slaughterhouse Creek	0.0	0.0	105.0	42.0	48.5	7.6	89.4	0.0	0.0	92.7	0.0	0.0	0.0	385.2
GAR031300010815	0.0%	0.0%	27.3%	10.9%	12.6%	2.0%	23.2%	0.0%	0.0%	24.1%	0.0%	0.0%	0.0%	100%
Snake Creek	8.9	322.5	1218.3	135.9	57.6	1253.4	13312.8	2.0	2358.3	1346.2	97.4	0.0	0.0	20113.2
GAR031300020341	0.0%	1.6%	6.1%	0.7%	0.3%	6.2%	66.2%	0.0%	11.7%	6.7%	0.5%	0.0%	0.0%	100%

Stream Segment and Assessment Unit ID	Land Uses (acres)													
	Beaches, Dunes, Mud	Open Water	Developed, Low Intensity	Developed, Medium Intensity	Developed, High Intensity	Transitional, Clearcut, Sparse	Forest	Row Crops	Pasture, Hay	Other Grasses (Developed Open Space, Utility Swaths, Golf Courses)	Forested Wetlands	Non-Forested Wetlands (Salt/Brackish)	Non-Forested Wetlands (Freshwater)	Total
Snake Creek	10.7	717.7	1573.4	183.3	69.6	1539.9	18849.5	3.6	2965.4	1974.0	295.3	0.0	4.2	28186.6
GAR031300020343	0.0%	2.5%	5.6%	0.7%	0.2%	5.5%	66.9%	0.0%	10.5%	7.0%	1.0%	0.0%	0.0%	100%
Snake Creek	10.7	741.5	1720.9	192.4	69.8	1699.8	21362.6	144.1	3074.2	2162.3	519.5	0.0	10.0	31707.7
GAR031300020342	0.0%	2.3%	5.4%	0.6%	0.2%	5.4%	67.4%	0.5%	9.7%	6.8%	1.6%	0.0%	0.0%	100%
South Fork Balus Creek	0.9	0.0	409.0	212.8	198.8	38.3	440.6	0.0	258.2	296.2	0.0	0.0	0.0	1854.8
GAR031300010806	0.0%	0.0%	22.1%	11.5%	10.7%	2.1%	23.8%	0.0%	13.9%	16.0%	0.0%	0.0%	0.0%	100%
South Fork Limestone Creek/ Limestone Creek	0.9	3.1	610.0	395.9	255.1	46.7	630.5	0.0	58.9	391.9	1.6	0.0	0.0	2394.5
GAR031300010304	0.0%	0.1%	25.5%	16.5%	10.7%	2.0%	26.3%	0.0%	2.5%	16.4%	0.1%	0.0%	0.0%	100%
Taylor Creek	2.2	8.5	135.4	16.9	4.9	83.2	1303.7	0.0	432.6	300.0	6.2	0.0	0.0	2293.6
GAR031300010701	0.1%	0.4%	5.9%	0.7%	0.2%	3.6%	56.8%	0.0%	18.9%	13.1%	0.3%	0.0%	0.0%	100%
Toto Creek	0.4	0.2	72.1	14.5	4.9	24.2	243.7	0.0	37.8	176.1	0.0	0.0	0.0	589.6
GAR031300010702	0.1%	0.0%	12.2%	2.5%	0.8%	4.1%	41.3%	0.0%	6.4%	29.9%	0.0%	0.0%	0.0%	100%
Tributary to Limestone Creek	0.0	0.0	275.8	157.7	108.1	26.9	233.7	0.0	16.5	201.7	1.6	0.0	0.0	1021.9
GAR031300010318	0.0%	0.0%	27.0%	15.4%	10.6%	2.6%	22.9%	0.0%	1.6%	19.7%	0.2%	0.0%	0.0%	100%
Tributary to West Fork Little River	0.0	0.0	8.9	4.4	0.0	10.2	194.6	0.0	180.8	36.9	0.0	0.0	0.0	435.9
GAR031300010407	0.0%	0.0%	2.0%	1.0%	0.0%	2.3%	44.6%	0.0%	41.5%	8.5%	0.0%	0.0%	0.0%	100%

Stream Segment and Assessment Unit ID	Land Uses (acres)													
	Beaches, Dunes, Mud	Open Water	Developed, Low Intensity	Developed, Medium Intensity	Developed, High Intensity	Transitional, Clearcut, Sparse	Forest	Row Crops	Pasture, Hay	Other Grasses (Developed Open Space, Utility Swaths, Golf Courses)	Forested Wetlands	Non-Forested Wetlands (Salt/Brackish)	Non-Forested Wetlands (Freshwater)	Total
Troup Branch	2.2	2.4	528.6	207.7	195.7	38.7	196.8	0.2	57.8	194.4	19.1	0.0	0.0	1443.8
GAR031300020904	0.2%	0.2%	36.6%	14.4%	13.6%	2.7%	13.6%	0.0%	4.0%	13.5%	1.3%	0.0%	0.0%	100%
Two Mile Creek	0.2	2.7	227.5	33.1	22.7	33.8	1366.6	0.0	694.5	459.2	22.9	0.0	0.0	2863.3
GAR031300010807	0.0%	0.1%	7.9%	1.2%	0.8%	1.2%	47.7%	0.0%	24.3%	16.0%	0.8%	0.0%	0.0%	100%
Wahoo Creek	2.2	14.5	328.5	71.2	30.2	540.4	9864.3	95.0	3904.4	1139.3	59.6	0.0	0.0	16049.6
GAR031300010403	0.0%	0.1%	2.0%	0.4%	0.2%	3.4%	61.5%	0.6%	24.3%	7.1%	0.4%	0.0%	0.0%	100%
Wahoo Creek	10.7	170.6	3067.7	1124.7	1007.4	698.8	10275.5	3.6	2357.6	2736.8	987.7	0.0	20.7	22461.7
GAR031300020412	0.0%	0.8%	13.7%	5.0%	4.5%	3.1%	45.7%	0.0%	10.5%	12.2%	4.4%	0.0%	0.1%	100%
West Fork Little River	3.3	17.6	673.4	94.1	35.1	373.2	5927.9	254.6	4728.1	1116.9	16.9	0.0	0.0	13241.2
GAR031300010404	0.0%	0.1%	5.1%	0.7%	0.3%	2.8%	44.8%	1.9%	35.7%	8.4%	0.1%	0.0%	0.0%	100%
Whooping Creek	7.6	62.7	646.7	76.1	32.7	483.5	4579.3	0.9	1480.5	754.8	44.7	0.0	0.0	8169.5
GAR031300020430	0.1%	0.8%	7.9%	0.9%	0.4%	5.9%	56.1%	0.0%	18.1%	9.2%	0.5%	0.0%	0.0%	100%
Whooping Creek	7.6	80.1	1148.4	121.7	54.5	921.6	12487.5	50.7	3736.2	1553.0	65.2	0.0	0.0	20226.4
GAR031300020431	0.0%	0.4%	5.7%	0.6%	0.3%	4.6%	61.7%	0.3%	18.5%	7.7%	0.3%	0.0%	0.0%	100.0%
Wolf Creek	1.3	47.4	456.4	24.5	5.6	364.1	7449.3	0.0	1396.6	759.7	325.4	0.0	1.6	10831.7
GAR031300020321	0.0%	0.4%	4.2%	0.2%	0.1%	3.4%	68.8%	0.0%	12.9%	7.0%	3.0%	0.0%	0.0%	100.0%
Yellowjacket Creek	30.0	315.1	2469.3	398.5	197.0	3928.4	34930.9	202.2	8512.2	3074.4	4340.3	0.0	65.2	58463.4
GAR031300020714	0.1%	0.5%	4.2%	0.7%	0.3%	6.7%	59.7%	0.3%	14.6%	5.3%	7.4%	0.0%	0.1%	100%

2.0 WATER QUALITY ASSESSMENT

Stream segments are placed on the 303(d) list as not supporting their water use classification based on water quality sampling data. Currently, a stream is placed on this list if more than ten percent of the calculated geometric means exceed their water quality criteria or if more than ten percent of the samples exceed the single sample criteria. Water quality samples collected within a 30-day period that have a fecal coliform geometric mean in excess of 200 counts per 100 milliliters (mL) during the period May through October, or in excess of 1000 counts per 100 mL during the period November through April, are in violation of the bacteria water quality criteria. There is also a single sample criterion (4000 counts per 100 mL) not to be exceeded at any given time.

Fecal coliform data used for development of the TMDL in this document were collected during calendar years 2013 through 2021 by GA EPD as part of the trend monitoring program. A summary of sampling station locations and sampling dates is given in Table 5. The raw data are presented in Appendix A. Fourteen streams in which the TMDLs are being revised are currently meeting their water quality standards. These streams may have been listed on spill data, and that is no longer available. An alternative method for calculating the TMDL bacterial loading was developed and will be described in later sections with supporting information in Appendix A.

Table 5: Sampling Stations and Dates – Chattahoochee River Basin

Stream Segment	Location	Assessment Unit ID	GA EPD Monitoring Station No.	Monitoring Station Description	GPS Coordinates	Sample Date Range
Anneewakee Creek	Lake Monroe to Chattahoochee River	GAR031300020304	RV_12_3949	Anneewakee Creek at State Road 166 near Douglasville, GA	33.665278, -84.683611	2017
Brush Creek	Tributary to West Point Lake	GAR031300020605	RV_12_4225	Brush Creek at Bevis Rd near Franklin, GA	33.201865, -85.116664	2018
Chattahoochee River	Dicks Creek to Johns Creek	GAR031300010913	RV_12_3841	Chattahoochee River at McGinnis Ferry Road	34.050556, -84.097701	2016-2021
Coheelee Creek	Chancy Mill Creek to Chattahoochee River	GAR031300040502	RV_12_4289	Coheelee Creek nr Old River Rd nr Blakely, GA	31.30768, -85.07788	2015
Cooper Creek	Headwaters to Bull Creek - Columbus	GAR031300030107	Columbus Consolidated Government COOP#2	Cooper Creek at Macon Rd at Gidden Rd culvert	32.49107, -84.920703	2016-2021
Crawford Creek	Headwaters to Sulphur Creek	GAR031300021010	RV_12_17315	Crawford Creek at Perry Mill Rd near Lagrange, GA	32.93522, -84.88933	2018
Deer Creek	Headwaters to Centralhatchee Creek	GAR031300020422	RV_12_17316	Deer Creek at Spradlin Rd near Centralhatchee, GA	33.34844, -85.13915	2018
Denny Creek	Headwaters to Centralhatchee Creek	GAR031300020433	RV_12_17499	Denny Creek at Denny Creek Rd near Ephesus, GA	33.39807, -85.21259	2019
Dozier Creek	Headwaters to Randall Creek	GAR031300030311	Columbus Consolidated Government DOZR#1	Dozier Creek at Macon Rd culvert, past Garrett Rd	32.53916, -84.8126	2016-2017
East Trammel Branch	Headwaters to Yellowjacket Creek	GAR031300020716	RV_12_5131	East Trammel Branch at Bradbury Rd. near Luthersville, GA	33.224, -84.763	2015
Flatrock Creek	Tributary to Bull Creek - Columbus	GAR031300030110	Columbus Consolidated Government FLRK#2	Flat Rock Creek at Macon Rd at culvert by Heckler-Koch	32.519, -84.8781	2016-2021
Fort Creek	Headwaters to Dowdell Creek	GAR031300021216	RV_12_5130	Fort Creek at GA Hwy 116 near Pine Mountain Valley, GA	32.794, -84.802	2015
Glade Branch	Headwaters to Town Creek	GAR031300010514	RV_12_17280	Glade Branch at Town Creek Road near Cleveland, GA	34.5997, -83.85579	2020

Stream Segment	Location	Assessment Unit ID	GA EPD Monitoring Station No.	Monitoring Station Description	GPS Coordinates	Sample Date Range
Hannahatchee Creek	Ben Owens Creek to Bussey Branch	GAR031300030704	RV_12_4297	Hannahatchee Creek at MooresStore Rd nr Richland, GA	32.14205, -84.756105	2021
Hillabahatchee Creek	Alabama State line to Red Oak Creek	GAR031300020613	RV_12_4123	Hillabahatchee Creek at CR 210 near Frolona, GA	33.311218, -85.187675	2016-2021
Hillabahatchee Creek	Red Oak Creek to Tollieson Branch, Franklin	GAR031300020614	RV_12_4123	Hillabahatchee Creek at CR 210 near Frolona, GA	33.311218, -85.187675	2016-2021
House Creek	Headwaters to Sand Creek	GAR031300021015	RV_12_16354	House Creek at Monument Rd	32.82465, -85.04544	2016
Lick Log Creek	Lake Romona to Mill Creek	GAR031300020218	RV_12_4122	Lick Log Creek at Laird Road near Powder Springs, GA	33.853, -84.767	2013
Milligan Creek	Headwaters to Pond 0.9 miles upstream of the Heard County Line	GAR031300020428	RV_12_4214	Milligan Creek at Star Point Rd nr Roopville, GA	32.641702, -84.953146	2013
North Prong Kolomoki Creek	Tributary 1 mile downstream of Bluffton Highway to Kolomoki Creek	GAR031300040205	RV_12_16327	North Prong Kolomoki Creek at Kolomoki Rd near Bluffton, GA	31.501361, -84.942894	2016
Pataula Creek	Beaver Creek to Brier Creek	GAR031300031507	RV_12_17767	Pataula Creek at U.S. Hwy 27 near Lumpkin, GA	31.934068, -84.801618	2021
Sand Creek	Headwaters to House Creek	GAR031300021018	RV_12_16370	Sand Creek at Yates Rd near West Point, GA	32.82918, -85.09608	2016
Standing Boy Creek	Striblin Creek to Mobleys Lake	GAR031300021308	RV_12_4146	Standing Boy Creek at Fortson Rd near Cataula, GA	32.641702, -84.953146	2018
Tar River	Headwaters to Montarella Lake	GAR031300030204	Columbus Consolidated Government TAR#1	Tar River at Macon Rd culvert near Chantileer	32.55577, -84.6942	2016-2017
Tate Creek	Headwaters to Chestatee River	GAR031300010512	RV_12_17722	Tate Creek at Powder Springs Rd near Suches, GA	34.60948, -83.92115	2020
Town Branch	Lake Val-Do Mar to Mud Creek - Villa Rica	GAR031300020211	RV_12_4121	Town Branch at Brewer Road near Villa Rica, GA	33.754, -84.862	2013
Town Creek	Alabama State line to tributary 0.5 miles upstream of Arrington Rd	GAR031300020611	RV_12_4333	Town Creek nr Town Creek Rd nr Woodland, AL	33.298172, -85.266937	2016

Stream Segment	Location	Assessment Unit ID	GA EPD Monitoring Station No.	Monitoring Station Description	GPS Coordinates	Sample Date Range
Town Creek	Tributary 0.5 miles upstream of Arrington Rd to Little Creek	GAR031300020612	RV_12_4333	Town Creek nr Town Creek Rd nr Woodland, AL	33.298172, -85.266937	2016
Tributary to Bull Creek	Headwaters to Bull Creek	GAR031300030121	Columbus Consolidated Government STMR 1	Tributary to Bull Creek at Buena Vista Rd	32.4537, -84.94151	2018-2021
Tributary to Cemochechobee Creek	Headwaters to Cemochechobee Creek	GAR031300040107	RV_12_16762	Trib to Cemochechobee Creek at Coleman Rd. near Fort Gaines, Ga.	31.635659, -85.00806	2017
Tributary to Lick Log Creek	Headwaters to Lick Log Creek	GAR031300020224	RV_12_17812	Trib to Lick Log Creek at Nebo Rd near Hiram, GA	33.84961, -84.7863	2021
Tributary to Mountain Creek	Callaway Gardens WPCP to Mountain Creek	GAR031300021103	RV_12_16773	Trib to Mountain Creek at Callaway Gardens near Pine Mountain, GA	32.828, -84.861	2018
Tributary to Mulberry Creek	Headwaters to Oak View Home WPCP	GAR031300021220	RV_12_17518	Trib to Mulberry Creek on Oakview St near intersection with Pond Street, Waverly Hall, GA	32.6875, -84.73889	2019
Tributary to Mulberry Creek	Oak View Home WPCP to Mulberry Creek	GAR031300021219	RV_12_17519	Trib to Mulberry Creek at Oakview Street near Waverly Hall, GA	32.688794, -84.741871	2019
White Sulfur Creek	Headwaters to Sulphur Creek	GAR031300021006	RV_12_17314	White Sulfur Creek at Hubert Russell Rd near Greenville, GA	32.92034, -84.81318	2018
Whitewater Creek	Headwaters to tributary 0.5 miles upstream Heard/Troup County Line	GAR031300020804	RV_12_4242	Whitewater Creek at North Glenn Rd	33.152251, -85.154088	2016
Whitewater Creek	Tributary 0.5 miles upstream Heard/Troup County Line to West Point Lake	GAR031300020805				

3.0 SOURCE ASSESSMENT

An important part of the TMDL development process is the identification of potential sources of pollutants causing the waterbody to be listed on the 303(d) list. A source assessment identifies the known and suspected sources and discharges of bacteria in the watershed. Sources are broadly classified as either point or nonpoint sources. The CWA defines a point source as any "discernable, confined, and discrete conveyance including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture." Nonpoint sources are diffuse, and generally, but not always, involve accumulation of bacteria on land surfaces that wash off due to storm events.

3.1 Point Source Assessment

Title IV of the CWA establishes the National Pollutant Discharge Elimination System (NPDES) permit program. Basically, there are two categories of NPDES permits: 1) wastewater treatment facilities, and 2) regulated stormwater discharges.

3.1.1 Wastewater Treatment Facilities

In general, NPDES point source discharge permits are issued to Publicly Owned Treatment Works (POTWs) and Non-Publicly Owned Treatment Works (Non-POTWs) authorizing the discharge of treated wastewater to surface waters. POTWs are commonly associated with city and county owned wastewater treatment facilities; whereas Non-POTWs are associated with industrial, private, and federal facilities. The permits include permit conditions, requirements, and numeric effluent limits developed using federal and state effluent guidelines (secondary treatment standards for POTWs and technology-based limits (TBELs) for Non-POTWs) or on water quality standards (water quality-based effluent limits, WQBELs).

The United States Environmental Protection Agency (USEPA) has developed technology-based standards and guidelines, which establish a minimum standard of pollution control for POTW and Non-POTW discharges without regard for the quality of the receiving waters. For POTWs, EPA has established Secondary Treatment Standards. For Non-POTW, the TBELs are based on Best Practical Control Technology Currently Available (BPT), Best Conventional Control Technology (BCT), Best Available Technology Economically Achievable (BAT), and New Source Performance Standards. The level of control required by each facility is dependent on the source of wastewater generated and the pollutants found in the discharge.

The USEPA and the States have also developed numeric and narrative water quality criteria to protect a stream's designated uses. Typically, these criteria are based on the results of aquatic toxicity tests and/or human health criteria and include a margin of safety. Wastewater NPDES permits also include WQBELs to protect these narrative and numeric water quality criteria and their designated uses. WQBELs ensure water quality standards are met in the receiving water and downstream uses are protected.

For purposes of this TMDL, permitted wastewater treatment facilities are considered point sources, and include POTWs and Non-POTWs. Pollutants discharged from wastewater treatment plants can contribute bacteria to receiving waters. As of 2023, there are twenty-seven (27) NPDES

permitted discharges identified in the watershed of the listed segments in the Chattahoochee River Basin that could potentially impact streams on the 2022 303(d) list for fecal coliform bacteria or those streams with revised TMDLs. Typically, the contributing watershed for a 303(d) listed segment is defined as the area upstream of the segment.

Table 6 provides the monthly average discharge flow and fecal coliform concentrations for these facilities that currently have bacteria permit limits. These data were obtained from calendar years 2016 through 2021 Discharge Monitoring Reports (DMR). The current permitted flow and fecal coliform concentrations are also included in this table. Table 7 also provides a list of existing Non-POTW discharges without bacteria permit limits. It is possible these facilities could contribute bacteria to receiving water because of the type of treatment processes they employ.

Another potential point source contribution may be a combined sewer system (CSS) that conveys a mixture of raw sewage and stormwater in the same conveyance structure to the wastewater treatment plant and may also have direct discharges (as authorized under a NPDES permit) to waters of the state. These are generally a component of POTWs. When the combined sewage exceeds the capacity of the wastewater treatment plant, the excess is diverted to a combined sewage overflow (CSO) discharge point. The Cities of Atlanta and Columbus have CSOs in the Chattahoochee River Basin; however, there are no permitted CSO outfalls in the watersheds of the stream segments covered by this TMDL.

3.1.2 Regulated Stormwater Discharges

Discharges of stormwater authorized under a NPDES permit are considered a point source. Unlike other wastewater NPDES permits that establish end-of-pipe effluent limits, stormwater NPDES permits establish best management practices (BMPs) and controls that are intended to reduce the quantity of pollutants that stormwater picks up and carries into storm sewer systems during rainfall events “to the maximum extent practicable.” Currently, regulated stormwater discharges that may contain bacteria, consist of those associated with industrial activities and large, medium, and small municipal separate storm sewer systems (MS4s) that serve populations of 10,000 or more.

3.1.2.1 Industrial General Stormwater NPDES Permit

Stormwater discharges associated with industrial activities are currently covered under the 2022 NPDES General Permit for Stormwater Discharges Associated with Industrial Activity (GAR050000) also called the Industrial General Permit (IGP). This permit requires visual monitoring of stormwater discharges, site inspections, implementation of BMPs, preparation of a Storm Water Pollution Prevention Plan (SWPPP), and annual reporting. The IGP requires that stormwater discharging into an impaired stream segment or within one linear mile upstream of, and within the same watershed as, any portion of an impaired stream segment identified as “not supporting” its designated use(s), must satisfy the requirements of Appendix C of the 2022 IGP, if the pollutant(s) of concern for which the impaired stream segment has been listed may be exposed to stormwater as a result of industrial activity at the site. If a facility is covered under Appendix C of the IGP, then benchmark monitoring for the pollutant(s) of concern is required. Delineations of both supporting and not supporting waterbodies are provided on the GA EPD website, and are available in ESRI ArcGIS shapefile format or in KMZ format for use in Google Earth. Interested parties may evaluate their proximity to not supporting waterbodies by utilizing these geospatial files.

Table 6: NPDES Facilities Discharging Fecal Coliform in the Chattahoochee River Basin

Facility Name	NPDES Permit No.	Receiving Stream	303(d) Listed Segment(s)	Actual Discharge (2016–2021)		NPDES Permit Limits		Number of Spills[c]
				Avg. Monthly Flow (MGD)[a]	Avg. Monthly fecal coliform (#/100mL)[b]	Avg. Monthly Flow (MGD)	Avg. Monthly fecal coliform (#/100mL)	
ABP Enterprises, LLC (Arbor Village WPCP)	GA0031526	Unnamed Tributary to Little Anneewakee Creek	Anneewakee Creek GAR031300020304	0.01	6.79	0.02	200	0
Buford, City of (Southside WPCP)	GA0023167	Suwanee Creek	Chattahoochee River GAR031300010913	1.6	24.58	3	23	5
Buford, City of (Westside WPCP)	GA0023175	Richland Creek	Chattahoochee River GAR031300010913	0.14	28.48	0.25	200	5
CGR Georgia LLC (Callaway Resort & Gardens WPCP)	GA0022527	Unnamed tributary to Mountain Creek	Tributary to Mountain Creek GAR031300021103	0.12	22.53	0.5	200	0
Flowery Branch, City of (Flowery Branch WPCP)	GA0031933	Lake Lanier	Chattahoochee River GAR031300010913	0.32	2.9	2.2	200	0
Forsyth County Department of Water & Sewer (Dick Creek WRF)	GA0038563	Dick Creek	Chattahoochee River GAR031300010913	0.43	1.76	0.76	23	0
Forsyth County Department of Water and Sewer (Fowler & Shakerag WRF)	GA0038954	Chattahoochee River	Chattahoochee River GAR031300010913	1.77	1.75	10	200	44
Forsyth County Department of Water and Sewer (James Creek WRF)	GA0050238	James Creek	Chattahoochee River GAR031300010913	0.84	1.23	2.55	23	1
Gainesville, City of (Flat Creek WRF)	GA0021156	Flat Creek to Lake Sidney Lanier	Chattahoochee River GAR031300010913	7.66	2.65	12	23	19
Greenleaf Investment Partners L026D, LLC (Dixie Mobile Home Park WPCP)	GA0023043	Unnamed Tributary to Flat Creek	Chattahoochee River GAR031300010913	0.001	16.9	0.0043	200	0
Gwinnett County Board of Commissioners (F. Wayne Hill WRC)	GA0038130	Lake Sidney Lanier	Chattahoochee River GAR031300010913	33.5	1	50	2	0
Koch Foods of Pine Mountain Valley	GA0001317	Fort Creek	Fort Creek GAR031300021216	0.61	26.06	-	200	0

Facility Name	NPDES Permit No.	Receiving Stream	303(d) Listed Segment(s)	Actual Discharge (2016–2021)		NPDES Permit Limits		Number of Spills[c]
				Avg. Monthly Flow (MGD)[a]	Avg. Monthly fecal coliform (#/100mL)[b]	Avg. Monthly Flow (MGD)	Avg. Monthly fecal coliform (#/100mL)	
Lanier Islands Resort (Lake Lanier Islands Resort WPCP)	GA0049115	Lake Lanier	Chattahoochee River GAR031300010913	0.05	1.59	0.35	200	0
Oak View Home, Inc (Oak View Home WPCP)	GA0031208	Unnamed tributary to Mulberry Creek	Tributary to Mulberry Creek GAR031300021219	0.006	905.67	0.014	200	0
R Home Rentals, LLC. (Acres of Shade Mobile Home Park WPCP)	GAG550151	Striblin Creek	Standing Boy Creek GAR031300021308	0.00135	239.95	0.00225	200	0
Shady Grove Mobile Home Park WPCP	GA0023469	Unnamed tributary to Balus Creek to Lake Lanier	Chattahoochee River GAR031300010913	ND	ND	0.0029	200	0
Villa Rica, City of (North Sweetwater WPCP)	GA0027171	Unnamed tributary to Town Branch	Town Branch GAR031300020211	0.35	3.27	0.52	200	0
Revised TMDLs								
Cleveland, City of (Cleveland WPCP)	GA0036820	Tesnatee Creek	Chestatee River GAR031300010704	0.45	6.73	0.75	200	12
Coweta County (Arnall/Sargent WPCP)	GA0000299	Wahoo Creek	Wahoo Creek GAR031300020412	0.03	20.14	0.06	200	0
Coweta County Water & Sewer Authority (Arnco WPCP)	GA0000311	Wahoo Creek	Wahoo Creek GAR031300020412	0.05	25.75	0.10	200	0
Dahlonega, City of (Dahlonega WPCP)	GA0026077	Yahoola Creek	Chestatee River GAR031300010704	0.71	5.72	1.44	200	8
Forsyth County Department of Water and Sewer (James Creek WRF)	GA0050238	James Creek	James Creek GAR031300010902	0.84	1.23	2.55	23	1
Grantville, City of (Pine Street Pond # 2 WPCP)	GA0033201	Unnamed tributary to Messiers Creek	New River GAR031300020508	0.02	8.25	0.04	200	0
Grantville, City of (Meriwether Street WPCP - Pond #3)	GA0033219	Unnamed tributary to Yellow Jacket Creek	Yellowjacket Creek GAR031300020714	0.02	13.82	0.05	200	0

Facility Name	NPDES Permit No.	Receiving Stream	303(d) Listed Segment(s)	Actual Discharge (2016–2021)		NPDES Permit Limits		Number of Spills[c]
				Avg. Monthly Flow (MGD)[a]	Avg. Monthly fecal coliform (#/100mL)[b]	Avg. Monthly Flow (MGD)	Avg. Monthly fecal coliform (#/100mL)	
Haggai Realty LLC (Oak Grove Mobile Home Park WPCP)	GA0034207	Unnamed tributary to Cane Creek	Chestatee River GAR031300010704	0.002	253.06	.005	200	0
Hogansville, City of (Hogansville WPCP)	GA0050218	Yellow Jacket Creek	Yellowjacket Creek GAR031300020714	0.38	3.59	1.50	200	1
Mountain Lakes Water & Sewer Authority, Inc. (Mountain Lake Resort WPCP)	GA0046400	Lake Qualatchee	Chestatee River GAR031300010704	0.007	38.00	0.009	200	1
Newnan Utilities (Mineral Springs WPCP)	GA0021423	Mineral Springs Branch	New River GAR031300020508	0.68	3.92	4.00	23	0
Newnan Utilities (Wahoo Creek WPCP)	GA0031721	Unnamed tributary to Wahoo Creek	Wahoo Creek GAR031300020412	2.31	4.09	3.00	200	5
Pentagon Properties, Inc (Cedar Village Manufactured Home Community WPCP)	GA0038512	Unnamed Tributary to Whooping Creek	Whooping Creek GAR031300020430 Whooping Creek GAR031300020431	0.01	358.73	0.03	200	0
Pine Lakes Mobile Home Park, LLC (Pine Lakes WPCP)	GA0035271	Bear Creek	Bear Creek GAR031300020313	0.02	33.83	0.05	200	0
Pine Mountain, Town of (Pine Mountain WPCP)	GA0025691	Turkey Creek	Flat Shoals Creek GAR031300021019 Flat Shoals Creek GAR031300021020	0.09	66.73	0.30	200	5
Shady Grove Mobile Home Park WPCP	GA0023469	Unnamed tributary to Balus Creek to Lake Lanier	South Fork Balus Creek GAR031300010806	ND	ND	.0029	200	0

Source: GA EPD – Discharge Monitoring Report (DMR data from ICIS-NPDES)

Notes: [a] - Values shown are the average of the monthly average flows reported in DMRs.

[b] - Values shown are the annual average of the monthly geometric means.

[c] - From GAPDES self-reported spill monitoring system.

ND – Facility was not discharging during this period.

Table 7: NPDES Non-POTW Facilities without Bacteria Permit Limits that Discharge to 303(d) Listed Stream Segments in the Chattahoochee River Basin

Facility Name	NPDES Permit No.	Receiving Stream	303(d) Listed Segment(s)
Buford Trout Hatchery	GA0026174	Chattahoochee River	Chattahoochee River GAR031300010913
Georgia Stone Products, LLC (Forsyth Quarry)	GA0050276	Unnamed tributaries to Six Mile Creek	Chattahoochee River GAR031300010913
Thomas Concrete of Georgia, Inc. (Suwanee Plant)	GA0050311	Unnamed tributary of Suwanee Creek	Chattahoochee River GAR031300010913
Revised TMDLs			
Georgia Stone Products, LLC (Forsyth Quarry)	GA0050276	Unnamed tributaries to Six Mile Creek	Six Mile Creek
			GAR031300010805

3.1.2.2 MS4 NPDES Permits

The collection, conveyance, and discharge of diffuse stormwater to local waterbodies by a public entity are regulated in Georgia by the NPDES MS4 permits. These MS4 permits have been issued under two phases. Phase I MS4 permits cover medium and large cities, and counties with populations over 100,000. Each individual Phase I MS4 permit requires the prohibition of non-stormwater discharges (i.e., illicit discharges) into the storm sewer systems and controls to reduce the discharge of pollutants to the maximum extent practicable, including the use of management practices, control techniques and systems, as well as design and engineering methods (Federal Register), 1990. A site-specific Storm Water Management Plan (SWMP) outlining appropriate controls is required by and referenced in the permit. A program to monitor and control pollutants in stormwater discharges from industrial facilities, construction sites, and highly visible pollutant sources that exist within the MS4 area must be implemented under the permit. Additionally, monitoring of not supporting streams, public education and involvement, post-construction stormwater controls, low impact development, and annual reporting requirements must all be addressed by the permittee on an ongoing basis. As of 2022, fifty-seven (57) counties and municipalities are covered by Phase I MS4 permits in Georgia.

Small MS4s serving urbanized areas are required to obtain a stormwater permit under the Phase II stormwater regulations. An urbanized area is defined as an area with a residential population of at least 10,000 people and an overall population density of at least 1,000 people per square mile. As of 2022, Seventy-three (73) municipalities, thirty-five (35) counties, five (5) Department of Defense facilities, and the Georgia Department of Transportation (GDOT) are permitted under the Phase II stormwater regulations in Georgia. All municipal Phase II permittees are authorized to discharge under General NPDES Stormwater Permit GAG610000. Department of Defense facilities are authorized to discharge under General NPDES Stormwater Permit GAG480000. GDOT owned or operated facilities are authorized to discharge under General NPDES Stormwater Permit GAR041000.

Under these general permits, each permittee must design and implement a SWMP that incorporates BMPs that focus on public education and involvement, illicit discharge detection and elimination, construction site runoff control, post-construction stormwater management, and

pollution prevention in municipal operations. Table 8 provides the Phase I or Phase II counties, communities, and other entities covered by MS4s Permits in the Chattahoochee River Basin. There are twenty-one (21) permitted MS4s that discharge into or upstream of a stream segment not supporting its designated use for bacteria.

Table 8: Permitted MS4s in the Chattahoochee River Basin

Permit No.	MS4 Permittee	MS4 Phase	Impaired Stream Watershed
GAS000104	Buford, City of	Phase 1	Big Creek GAR031300010813
GAG610000	Carroll County	Phase 2 > 10,000	Acorn Creek GAR031300020401 Centralhatchee Creek GAR031300020421 Milligan Creek GAR031300020428 Snake Creek GAR031300020341 Snake Creek GAR031300020342 Snake Creek GAR031300020343 Whooping Creek GAR031300020430 Whooping Creek GAR031300020431 Wolf Creek GAR031300020321
GAS000202	Columbus Consolidated Government	Phase 1	Cooper Creek GAR031300030107 Flatrock Creek GAR031300030110 Tributary to Bull Creek GAR031300030121 Dozier Creek GAR031300030311 Tar River GAR031300030204
GAG610000	Coweta County	Phase 2 > 10,000	Cedar Creek GAR031300020420 East Trammel Branch GAR031300020716 New River GAR031300020508 Panther Creek GAR031300020408 Wahoo Creek GAR031300020412 Yellowjacket Creek GAR031300020714
GAG610000	Cumming, City of	Phase 2 < 10,000	Chattahoochee River GAR031300010913 Sawnee Creek GAR031300010804

Permit No.	MS4 Permittee	MS4 Phase	Impaired Stream Watershed
GAG610000	Dawson County	Phase 2 > 10,000	Taylor Creek GAR031300010701 Toto Creek GAR031300010702
GAG610000	Douglasville-Douglas County WSA (Douglas County)	Phase 2 > 10,000	Anneewakee Creek GAR031300020304 Baldwin Creek GAR031300020308 Bear Creek GAR031300020313 House Creek GAR031300020334 Little Bear Creek GAR031300020305 Billy Creek (Previously Nancy Long Crk/Billy Crk) GAR031300020310 Town Branch GAR031300020211
GAG610000	Flowery Branch, City of	Phase 2 < 10,000	Chattahoochee River GAR031300010913 Flowery Branch GAR031300010812
GAS000300	Forsyth County	Phase 1	Chattahoochee River GAR031300010913 Fourmile Creek GAR031300010809 James Creek GAR031300010902 Sawnee Creek GAR031300010804 Six Mile Creek GAR031300010805 Taylor Creek GAR031300010701 Two Mile Creek GAR031300010807
GAS000117	Fulton County	Phase 1	Cedar Creek GAR031300020420

Permit No.	MS4 Permittee	MS4 Phase	Impaired Stream Watershed
GAG610000	Gainesville, City of	Phase 2 > 10,000	Chattahoochee River GAR031300010913 Etta Vista Creek GAR031300010817 Longwood Park Creek GAR031300010816 Limestone Creek GAR031300010301 Rock Creek GAR031300010814 Slaughterhouse Creek GAR031300010815 South Fork Limestone Creek / Limestone Creek GAR031300010304 Tributary to Limestone Creek GAR031300010318 Tributary to Limestone Creek GAR031300010318
GAS000118	Gwinnett County	Phase 1	Chattahoochee River GAR031300010913
GAG610000	Hiram, City of	Phase 2 < 10,000	Lick Log Creek GAR031300020218
GAG610000	Johns Creek	Phase 2 < 10,000	Chattahoochee River GAR031300010913
GAG610000	Newnan, City of	Phase 2 > 10,000	New River GAR031300020508 Wahoo Creek GAR031300020412
GAG610000	Oakwood, City of	Phase 2 < 10,000	Chattahoochee River GAR031300010913 South Fork Balus Creek GAR031300010806
GAS000128	Palmetto, City of	Phase 1	Cedar Creek GAR031300020420

Permit No.	MS4 Permittee	MS4 Phase	Impaired Stream Watershed
GAG610000	Paulding County	Phase 2 < 10,000	Lick Log Creek GAR031300020218 Tributary to Lick Log Creek GAR031300020224
GAG610000	Peachtree Corners, City of	Phase 2 < 10,000	Chattahoochee River GAR031300010913
GAG610000	Villa Rica	Phase 2 < 10,000	Town Branch GAR031300020211
GAG410000	Georgia Department of Transportation	Phase 2	All segments related to other Phase 2 permittees in this table

Source: Nonpoint Source Program, GA DNR, 2022

For those listed segments whose contributing watersheds intersect with the jurisdiction of MS4 permit holders in the Chattahoochee River Basin, Table 9 provides the listed segment, total contributing watershed area and percentage of the watershed area that consists of urban land use types. Urbanized areas include land uses identified as residential, commercial, industrial, and transportation, as well as lawns, parks, and greenspace. These areas are quantified using the land use categories of low, medium, and high intensity developed, and other grasses as presented in Table 4.

Table 9: Urban Land Use Percentage for Listed Segments with MS4 Permit Contributions

Stream Segment	Location	Reach AUID	Total Watershed Area (acres)	Urban Land Use Percentage
Anneewakee Creek	Lake Monroe to Chattahoochee River	GAR031300020304	19227.8	61%
Chattahoochee River	Dicks Creek to Johns Creek	GAR031300010913	759154.3	47%
Cooper Creek	Headwaters to Bull Creek - Columbus	GAR031300030107	6351.2	85%
Dozier Creek	Headwaters to Randall Creek	GAR031300030311	5430.7	14%
Flatrock Creek	Tributary to Bull Creek - Columbus	GAR031300030110	5960.0	29%
Lick Log Creek	Lake Romona to Mill Creek	GAR031300020218	13872.8	10%
Town Branch	Lake Val-Do Mar to Mud Creek - Villa Rica	GAR031300020211	3693.5	69%

Stream Segment	Location	Reach AUID	Total Watershed Area (acres)	Urban Land Use Percentage
Tributary to Bull Creek	Headwaters to the Chattahoochee River	GAR031300030121	803.0	90%
Tributary to Lick Log Creek	Headwaters to Lick Log Creek	GAR031300020224	601.0	14%
Revised TMDLs				
Baldwin Creek	Headwaters to Little Bear Creek	GAR031300020308	1530.5	38.74%
Bear Creek	Dorsett Shoals Rd. to Little Bear Creek	GAR031300020313	3843.3	44.25%
Cedar Creek	Browns Creek to the Chattahoochee River (Formerly Coweta County)	GAR031300020420	33278.8	3.04%
Etta Vista Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010817	151.7	47.06%
Flowery Branch	Tributary to Lake Lanier	GAR031300010812	1386.0	64.20%
Fourmile Creek	Lake Lanier Tributary	GAR031300010809	5087.2	10.92%
House Creek	Headwaters to Anneewakee Creek	GAR031300020334	1150.2	80.74%
James Creek	Daves Creek to the Chattahoochee River	GAR031300010902	9661.3	53.79%
Limestone Creek	Headwaters to Brenau Lake	GAR031300010301	217.1	61.04%
Little Bear Creek	Annewakee Lake to Bear Creek	GAR031300020305	6214.5	23.90%
Longwood Park Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010816	137.3	71.77%
New River	Mountain Creek to West Point Lake - Corinth	GAR031300020508	80055.8	3.87%
Panther Creek	Headwaters to Cedar Creek	GAR031300020408	2944.9	0.12%
Rock Creek	Headwaters to Lake Lanier (Gainesville)	GAR031300010814	94.1	71.39%
Sawnee Creek	Lake Lanier Tributary	GAR031300010804	2960.0	31.16%
Six Mile Creek	Headwaters to Lake Lanier	GAR031300010805	2172.7	1.07%
Slaughterhouse Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010815	374.9	76.99%
South Fork Balus Creek	Headwaters to Balus Creek (Gainesville)	GAR031300010806	1848.9	56.71%
South Fork Limestone Creek/Limestone Creek	Headwaters to Limestone Creek Arm of Lake Lanier	GAR031300010304	2374.8	69.71%

Stream Segment	Location	Reach AUID	Total Watershed Area (acres)	Urban Land Use Percentage
Taylor Creek	Headwaters to Lake Lanier	GAR031300010701	2286.0	0.32%
Tributary to Limestone Creek	Breneau Lake to Limestone Creek	GAR031300010318	1014.8	73.46%
Two Mile Creek	Headwaters to Lake Lanier	GAR031300010807	2847.1	13.28%
Wahoo Creek	Downstream Arnco Mills Lake	GAR031300020412	22337.5	28.77%
West Fork Little River	Headwaters to Jim Hood Road above Lake Lanier	GAR031300010404	13192.9	0.92%

3.1.3 Concentrated Animal Feeding Operations

Animal feeding operations (AFOs) are agricultural operations where animals are kept and raised in confined situations. AFOs that meet the regulatory definition of a concentrated animal feeding operation (CAFO) are regulated under the NPDES permitting program. The NPDES program regulates the discharge of pollutants from point sources to waters of the state. From 1999 through 2001, Georgia adopted rules for permitting swine and non-swine liquid manure animal feeding operations (AFOs). Georgia rules required medium size AFOs with more than 300 animal units (AU), but less than 1,000 AU, to apply for a non-discharge state land application system (LAS) waste disposal permit. Large operations with more than 1000 AU were required to apply for an NPDES permit (also non-discharge) as a CAFO. The USEPA CAFO regulations were successfully appealed in 2005. They were revised to comply with the court's decision that NPDES permits only be required for actual discharges. Georgia's rules were amended on August 7, 2012, to reflect the USEPA revisions. The revised state rules authorize LAS permitting of medium and large size liquid manure AFOs unless they elect to obtain an NPDES permit. There are no known liquid manure CAFO located in the watersheds of the listed segments in the Chattahoochee River Basin that have NPDES or land application permits.

In 2002, the USEPA promulgated expanded NPDES permit regulations for CAFOs that added dry manure poultry operations larger than 125,000 broilers or 82,000 layers. In accordance with the Georgia rule amendment discussed above, the general permit covering these facilities has been terminated and they are no longer covered under any permit. Georgia is consistently among the top three states in the U.S. in terms of poultry operations. Most poultry farms are dry manure operations where the manure is stored for a time and then land applied. Freshly stored litter can be a nonpoint source of bacteria. However, land-applied litter previously stored for an extended length of time typically exhibits very low bacteria levels. There are no CAFOs located in the watersheds of the stream segments listed in Chattahoochee River.

3.2 Nonpoint Source Assessment

In general, nonpoint sources cannot be identified as entering a waterbody through a discrete conveyance at a single location. Typical nonpoint sources of bacteria include:

- Wildlife
- Agricultural Livestock
  - Animal grazing

  - Animal access to streams
  - Application of manure to pastureland and cropland
- Urban Development
  - Leaking sanitary sewer lines
  - Leaking septic systems
  - Land Application Systems
  - Landfills

In urban areas, a large portion of stormwater runoff may be collected in storm sewer systems and discharged through distinct outlet structures. For large urban areas, these storm sewer discharge points may be regulated as previously described in Section 3.1.2.

3.2.1 Wildlife

The significance of wildlife as a source of bacteria in streams varies considerably depending on the animal species present in the watershed. Based on information provided by the Wildlife Resources Division (WRD) of GA DNR, the greatest wildlife sources of bacteria are the animals that spend a large portion of their time in or around aquatic habitats. Of these, waterfowl, especially ducks and geese, are the most significant source, because when present, they are typically found in large numbers on the water surface. Other animals regularly found around aquatic environments include racoons, beavers, muskrats, and to a lesser extent, river otters and minks. Recently, rapidly expanding feral swine populations have become a substantial presence in the floodplain areas of the major rivers in Georgia.

White-tailed deer populations are also abundant throughout the Chattahoochee River Basin. Bacteria contributions to waterbodies from deer are generally considered to be less significant than that of waterfowl, racoons, and beavers. This is because a greater portion of their time is spent in terrestrial habitats. This also holds true for other terrestrial mammals such as squirrels and rabbits, and for terrestrial birds (GA WRD, 2007). However, feces deposited on the land surface can result in the introduction of bacteria to streams during runoff events. Between storm events, considerable decomposition of the fecal matter might occur, resulting in a decrease in the associated bacteria numbers.

3.2.2 Agricultural Livestock

Agricultural livestock are a potential source of bacteria to streams in the Chattahoochee River Basin. The animals grazing on pastureland deposit their feces onto land surfaces, where it can then be transported during storm events to nearby streams. Animal access to pastureland varies monthly, resulting in varying bacteria loading rates throughout the year. Beef cattle spend all their time in pastures, while dairy cattle and hogs are periodically confined. In addition, agricultural livestock will often have direct access to streams that pass through their pastures and can thus impact water quality in a more direct manner (USDA, 2002).

Commercial chickens are raised indoors, and their litter is periodically disposed of. The litter can be aged or composted. This results in the decomposition of the litter into a soil amendment that can be used as a fertilizer. The stockpiled manure should be kept in a sheltered area. Proper composting should generate temperatures of 140^{o}F to 160^{o}F, which destroys bacteria. Aging the manure and litter reduces populations of microbes by providing unfavorable growing conditions causing the bacteria to gradually die off due to changes in moisture content and temperature. Table 10 provides the estimated number of beef cattle, dairy cattle, goats, horses, swine, sheep, and chickens reported by county.

Table 10: Estimated Agricultural Livestock Populations in Counties Containing the 303(d) Listed Segment Watershed in the Chattahoochee River Basin

County	Livestock								
	Beef Cattle	Dairy Cattle	Swine	Sheep	Horses	Goats	Chickens		
							Broilers	Layers	Pullets
Baker	22,364	-	1,004	50	330	2,000	3,013,482	150,830	-
Calhoun	7,127	-	30	-	50	75	7,640,705	-	-
Chattahoochee	-	-	-	-	-	-	970,527	-	-
Clay	5,857	-	-	-	-	120	-	-	-
Clayton	802	-	-	80	257	1,650	-	-	-
Colquitt	13,772	-	5,022	50	450	650	54,915,247	220,952	196,470
Coweta	4,185	389	-	50	1,000	300	-	-	-
Crawford	2,697	-	-	-	50	-	12,707,067	-	-
Crisp	1,744	1,600	-	-	344	1,201	2,377,790	-	-
Decatur	21,412	1,200	50	50	200	400	5,795,493	23,815	-
Dooly	3,056	-	-	-	30	210	5,880,657	33,077	-
Dougherty	2,197	-	3	50	1,900	150	502,247	-	-
Early	20,619	-	55	1,000	-	3,502	-	23,815	-
Fayette	922	22	9	72	384	50	-	-	-
Fulton	1,489	-	20	250	2,286	450	-	-	-
Grady	19,665	515	176	30	290	250	15,682,116	31,092	83,916
Henry	2,028	40	-	-	1,500	400	-	-	-
Houston	5,231	434	-	78	350	405	2,183,682	82,692	-
Lamar	5,604	204	-	150	400	600	6,921,727	-	-
Lee	3,923	3,000	15	10	275	200	-	-	-
Macon	2,310	15,500	150	80	300	1,776	23,643,156	243,775	193,873
Marion	3,800	-	-	1,000	70	500	9,416,519	16,538	33,300
Meriwether	8,958	425	100	500	450	200	-	-	-
Miller	-	-	-	-	-	-	2,511,235	-	-
Mitchell	27,149	4,250	-	150	850	600	22,354,357	126,353	22,644
Monroe	6,789	167	50	1,350	500	450	8,225,932	-	-
Peach	433	-	-	50	250	100	-	-	-
Pike	3,832	189	-	75	485	400	1,574,435	-	-
Randolph	6,864	-	100	105	20	115	-	-	-
Schley	2,500	-	-	90	30	200	5,155,920	-	-
Seminole	11,151	91	401	-	345	-	-	-	-
Spalding	3,000	100	-	100	185	200	436,736	-	-
Total	221,478	28,126	7,186	5,420	13,581	17,157	191,909,030	952,939	530,203

Source: Center for Agribusiness and Economic Development, UGA 2022

3.2.3 Urban Development

Bacteria from urban areas are attributable to multiple sources, including: domestic animals, leaks and overflows from sanitary sewer systems, illicit discharges, leaking septic systems, runoff from improper disposal of waste materials, and leachate from both operational and closed landfills.

Urban runoff can contain high concentrations of bacteria from domestic animals and urban wildlife. Bacteria enter streams by direct wash-off from the land surface, or the runoff may be diverted to a stormwater collection system and discharged through a discrete outlet structure. For large, medium, and small urban areas (populations greater than 10,000), the stormwater outlets are regulated under MS4 permits (see Section 3.1.2). For smaller urban areas, the stormwater discharge outlets currently remain unregulated.

In addition to urban animal sources of bacteria, there may be illicit connections to the storm sewer system. As part of the MS4 permitting program, municipalities are required to conduct dry-weather monitoring to identify and then eliminate these illicit discharges, but this may not occur in unpermitted storm sewer systems. Bacteria may also enter streams from leaky sewer pipes, or during storm events when inflow and infiltration can cause sewer overflows.

3.2.3.1 Leaking Septic Systems

A portion of the bacteria contributions in the Chattahoochee River Basin may be attributed to failure of septic systems and illicit discharges of raw sewage. Table 11 below presents the number of septic systems existing at the end of 2015 and the number existing at the end of 2020 in counties in the Chattahoochee River Basin. These data are based on data provided by the Georgia Department of Public Health and information obtained from the U.S. Census. In addition, an estimate of the number of septic systems installed and repaired during the period from 2015 through 2020 is given. These data show an increase in the number of septic systems in all counties. Often, this reflects population increases outpacing the expansion of sewage collection systems.

Table 11: Estimated Number of Septic Systems in Counties within the Chattahoochee River Basin

County	Existing Septic Systems (2015)	Existing Septic Systems (2020)	Number of Septic Systems Installed (2015 to 2020)	Number of Septic Systems Repaired (2015 to 2020)
Banks	7,358	7,799	441	133
Carroll	32,445	33,602	1,157	1,233
Chattahoochee	1,221	1,247	26	17
Cherokee	39,470	41,118	1,648	947
Clay	1,319	1,373	54	43
Cobb	34,361	34,738	377	2,074
Coweta	32,727	35,195	2,468	1,389

County	Existing Septic Systems (2015)	Existing Septic Systems (2020)	Number of Septic Systems Installed (2015 to 2020)	Number of Septic Systems Repaired (2015 to 2020)
Dawson	9,587	10,083	496	254
DeKalb	22,659	22,686	27	721
Douglas	26,235	26,596	361	1,075
Early	4,284	4,384	100	111
Forsyth	33,349	34,513	1,164	1,999
Fulton	28,168	28,992	824	628
Gwinnett	65,405	66,333	928	3,005
Habersham	15,437	16,038	601	420
Hall	49,212	51,325	2,113	2,522
Harris	14,980	15,938	958	498
Heard	4,915	5,082	167	125
Lumpkin	12,632	13,545	913	208
Marion	2,496	2,637	141	41
Meriwether	9,146	9,518	372	186
Muscogee	3,212	3,352	140	105
Paulding	39,452	40,883	1,431	1,999
Quitman	1,653	1,695	42	50
Randolph	1,826	1,885	59	36
Seminole	4,721	4,823	102	124
Stewart	1,118	1,170	52	16
Talbot	2,962	3,069	107	42
Taylor	2,946	3,051	105	11
Troup	17,827	18,440	613	875
Union	14,642	15,734	1,092	288
White	11,523	12,003	480	313
Total	549,286	568,845	19,559	21,488

Source: The Georgia Dept. of Public Health, Environmental Health Section, 2022

3.2.3.2 Land Application Systems

Some communities and industries use land treatment systems for wastewater disposal. These facilities are required through land application system (LAS) permits to dispose of their treated wastewater by land application, and to operate as non-discharging systems that do not contribute wastewater effluent runoff to surface waters. However, sometimes the soil's percolation rate is exceeded when applying the wastewater, or encountering excess precipitation, resulting in runoff.

This runoff could contribute bacteria to nearby surface waters. Runoff of stormwater might also carry surface residual containing bacteria. Listed in Table 12 below are the LASs in the Chattahoochee River Basin that could potentially impact the stream segments in this TMDL are identified.

Table 12: Permitted Land Application Systems in the Chattahoochee River Basin

LAS Name	Permit No.	County	Type	Flow (MGD)	Impaired Stream Watershed
PPG Architectural Coatings, LLC c/o PPG Architectural Coatings, LLC	GAJ010362	Hall	Industrial	0.4	Chattahoochee River GAR031300010913
Tyson Poultry, Inc., River Valley Ingredients	GAJ010572	Forsyth	Industrial	S: 0.48, W:0.9	Chattahoochee River GAR031300010913
Wrigley Manufacturing Company, LLC	GAJ010595	Hall	Industrial	0.064	Chattahoochee River GAR031300010913
Forsyth County (Fowler WRF & James Creek WRF)	GAJ020186	Forsyth	Municipal	5	Chattahoochee River GAR031300010913
Vann's Tavern Community Association Inc. (Vann's Tavern Subdivision WPCP)	GAJ030917	Forsyth	Municipal	0.0315	Chattahoochee River GAR031300010913
Utilities Incorporated of Georgia, Inc. (Olde Atlanta Club WPCP)	GAJ030980	Forsyth	Municipal	0.2635	Chattahoochee River GAR031300010913
Revised TMDLs					
Chris Mote's Pumping Service, LLC	GAJ010524	White	Industrial	0.015	Chestatee River GAR031300010704
Coweta County Water & Sewer Authority (Blalock Lakes WPCP)	GAJ040032	Coweta	Municipal	0.026	New River GAR031300020508
Douglas County Board of Education (Dorsett Shoals Elementary School WPCP)	GAJ030826	Douglas	Municipal	0.0078	Baldwin Creek GAR031300020308 Little Bear Creek GAR031300020305
Forsyth County (Fowler WRF & James Creek WRF)	GAJ020186	Forsyth	Municipal	5	James Creek GAR031300010902
Georgia Department of Natural Resources (Unicoi State Park WPCP)	GAJ020066	White	Municipal	0.0582	Chattahoochee River GAR031300010105
Grantville, City of (Colley Street WPCP)	GAJ020287	Coweta	Municipal	0.15	New River GAR031300020508
Helen, City of (Helen WPCP)	GAJ020157	White	Municipal	0.5	Chattahoochee River GAR031300010105
Lumpkin County WSA (Red Oak Flats WRF)	GAJ030857	Lumpkin	Municipal	1.25	Chestatee River GAR031300010704
Marcus Jewish Community Center (Camp Barney Medintz WPCP)	GAJ040027	White	Municipal	0.027	Chestatee River GAR031300010704
Newnan Utilities (Mineral Springs WPCP - LAS)	GAJ020020	Coweta	Municipal	4	New River GAR031300020508
Ranch Owner's Association, Inc. (R-Ranch in the Mountains WPCP)	GAJ030972	Lumpkin	Municipal	0.1	Chestatee River GAR031300010704

LAS Name	Permit No.	County	Type	Flow (MGD)	Impaired Stream Watershed
Recovered Materials CO., LLC	GAJ010576	White	Industrial	0.15* permit renewal	Mossy Creek GAR031300010303
Serenbe Town Association (Serenbe WPCP)	GAJ030725	Fulton	Municipal	0.08	Cedar Creek GAR031300020420
Tyson Poultry, Inc., River Valley Ingredients	GAJ010572	Forsyth	Industrial	S: 0.48, W:0.9	Six Mile Creek GAR031300010805
URJ Camp Coleman WPCP	GAJ030731	White	Municipal	0.025	Chestatee River GAR031300010704
Yellow Jacket WPCP	GAJ030796	Troup	Municipal	Permit in Process	Yellowjacket Creek GAR031300020714

Source: Georgia Pollutant Discharge Elimination System, GA EPD, Atlanta, Georgia, 2022

3.2.3.3 Landfills

Leachate from landfills may contain bacteria that could at some point reach surface waters. Sanitary (or municipal landfills) are the most likely to serve as a source of bacteria. These types of landfills receive household wastes, animal manure, offal, hatchery and poultry processing plant wastes, dead animals, and other types of wastes. Older sanitary landfills were not lined, and most have been closed. Those that remain active and have not been lined operate as construction/demolition landfills. Currently active sanitary landfills are lined and have leachate collection systems. All landfills, excluding inert landfills, are now required to install environmental monitoring systems for groundwater and methane sampling. Table 13 provides the landfills located in the Chattahoochee River Basin.

Table 13: Permitted Landfills in the Chattahoochee River Basin

Facility Name	Permit Number	County	Interest Type	Operating Status
Advanced Disposal dba Eagle Point Landfill	058-012D(MSWL)	Forsyth	SW- Municipal Solid Waste Landfill	Operating
Anglin - Francis Rd (L)	058-005D(L)	Forsyth	SW- Construction & Demolition Landfill	Released
APAC/GA - Donzi Ln Ph 2 (L)	044-029D(L)	DeKalb	SW- Construction & Demolition Landfill	Closed/PCC
APAC/GA - Donzi Ln Ph 3 (L)	044-033D(L)	DeKalb	SW- Construction & Demolition Landfill	Closed/PCC
APAC/GA - Donzi Ln Ph 4 (L)	044-040D(L)	DeKalb	SW- Construction & Demolition Landfill	Closed/PCC
APAC/GA - Donzi Ln Ph 5A (L)	044-042D(L)	DeKalb	SW- Construction & Demolition Landfill	Closed/PCC
Atlanta - Cascade Rd (SL)	060-046D(SL)	Fulton	SW- Municipal Solid Waste Landfill	Closed/PCC
Atlanta - Confederate Ave (L)	060-057D(L)	Fulton	SW- Construction & Demolition Landfill	Closed/PCC
Atlanta - Gun Club Rd (SL)	060-026D(SL)	Fulton	SW- Municipal Solid Waste Landfill	Closed/PCC
Atlanta - Key Rd (SL)	060-048D(SL)	Fulton	SW- Municipal Solid Waste Landfill	Closed/PCC
Austell Boxboard Corporation (LI)	-	Cobb	SW- Private Industrial Landfill	-

Facility Name	Permit Number	County	Interest Type	Operating Status
B J Landfill/Waste Mgmt	067-027D(SL)	Gwinnett	SW- Municipal Solid Waste Landfill	Closed/PCC
BFI - Watts Rd (SL)	060-051D(SL)	Fulton	SW- Municipal Solid Waste Landfill	Closed/PCC
BFI-Hickory Ridge (MSWL)	044-048D(SL)	DeKalb	SW- Municipal Solid Waste Landfill	Closed/PCC
Blakley - Howell St/Pitt Rd (SL)	049-002D(SL)	Early	SW- Municipal Solid Waste Landfill	Closed/PCC
Blalock Rd Phase 4	028-017D(SL)	Cherokee	SW- Municipal Solid Waste Landfill	Closed/PCC
Bobby Hendrix (LI)	-	Fulton	SW- Private Industrial Landfill	-
Brown - SR 92 W Woodstock (L)	028-012D(L)	Cherokee	SW- Construction & Demolition Landfill	Archived
Buford - McEver Rd Ph 1 (SL)	067-008D(SL)	Gwinnett	SW- Municipal Solid Waste Landfill	Closed/PCC
Buford - Peachtree Ind Blvd Ph 2 (SL)	067-030D(SL)	Gwinnett	SW- Municipal Solid Waste Landfill	Closed/PCC
Buford - Tuggle Greer Rd (L)	067-019D(L)	Gwinnett	SW- Construction & Demolition Landfill	Closed/PCC
Button Gwinnett - Arnold Rd Ph 1 (SL)	067-021D(SL)	Gwinnett	SW- Municipal Solid Waste Landfill	Closed/PCC
Button Gwinnett Landfill	067-037D(SL)	Gwinnett	SW- Municipal Solid Waste Landfill	Closed/PCC
Camp Merrill - U S Army	093-004D(SL)	Lumpkin	SW- Municipal Solid Waste Landfill	Archived
Canton - Ridge Rd Ph 2 (SL)	028-014D(SL)	Cherokee	SW- Municipal Solid Waste Landfill	Closed/PCC
Carroll County Solid Waste	022-008D(SL)	Carroll	SW- Municipal Solid Waste Landfill	Closed/PCC
Chadwick Road Landfill	060-072D(L)	Fulton	SW- Construction & Demolition Landfill	Operating
Chambers - Bolton Rd (SL)	060-083D(SL)	Fulton	SW- Municipal Solid Waste Landfill	Closed/PCC
Chambers Oakdale Landfill	033-081D(L)	Cobb	SW- Construction & Demolition Landfill	Closed/PCC
Chamblee - Keswick Dr (L)	044-031D(L)	DeKalb	SW- Construction & Demolition Landfill	Archived
Cherokee Co - Blalock Rd Ph 3 (SL)	028-015D(SL)	Cherokee	SW- Municipal Solid Waste Landfill	Closed/PCC
Cherokee Co - Blalock Rd Ph 6 (SL)	028-041D(SL)	Cherokee	SW- Municipal Solid Waste Landfill	Permit Expired
Cherokee Co - Univeter Rd (L)	028-007D(L)	Cherokee	SW- Construction & Demolition Landfill	Archived
Cherokee Co-Swims - SR 92 Ph 4	028-040D(L)	Cherokee	SW- Construction & Demolition Landfill	In-Closure
Cherokee Co-Swims-SR 92 Ph 5	028-040D(C&D)	Cherokee	SW- Construction & Demolition Landfill	Operating
City of LaGrange Landfill	141-013D(SL)	Troup	SW- Municipal Solid Waste Landfill	Operating
Clay Co - SR 39 Ph 1 (SL)	030-002D(SL)	Clay	SW- Municipal Solid Waste Landfill	Archived

Facility Name	Permit Number	County	Interest Type	Operating Status
Clay Composting (COI)	099-012P(COI)	Meriwether	SW- Composting	Closed/PCC
Clay County Landfill	030-003D(SL)	Clay	SW- Municipal Solid Waste Landfill	Closed/PCC
Cobb Co - Cheatham Rd Ph 2 (SL)	033-038D(SL)	Cobb	SW- Municipal Solid Waste Landfill	Closed/PCC
Cobb Co - County Farm Rd #2 Phs 1-2-3 (L)	033-037D(L)	Cobb	SW- Construction & Demolition Landfill	Closed/PCC
Cobb County, Georgia â€“ North County Farm Road Municipal Solid Waste Composting Facility	033-095P(CO)	Cobb	SW- Composting	Closed/PCC
Colonial Pipeline (Atlanta JCT LFM) (SI)	033-035D(LS)I	Cobb	SW- Other-Processor/ Disposal	Operating
Columbus - Schatulga Rd W Fill Ph 2 (SL)	106-011D(SL)	Muscogee	SW- Municipal Solid Waste Landfill	Closed/PCC
Columbus Consolidated Government Pine Grove Landfill	106-016D(MSWL)	Muscogee	SW- Municipal Solid Waste Landfill	Operating
Columbus Sanitary Landfill	106-001D(SL)	Muscogee	SW- Municipal Solid Waste Landfill	Closed/PCC
Coweta Co - Ishman Ballard Rd Ph 1A (SL)	038-007D(SL)	Coweta	SW- Municipal Solid Waste Landfill	Closed/PCC
Coweta Co. - Ishman Ballard Rd C/D Landfill	038-015D(C&D)	Coweta	SW- Construction & Demolition Landfill	Operating
Cusseta - Firetower Road C/D Landfill (In-Place Closure)	026-005D(CLO)	Chattahoochee	SW- Construction & Demolition Landfill	In-Closure
Dawson Co - Shoal Hole Rd (SL)	042-002D(SL)	Dawson	SW- Municipal Solid Waste Landfill	Closed/PCC
DeKalb Co - Seminole Rd Ph 1 (SL)	044-017D(SL)	DeKalb	SW- Municipal Solid Waste Landfill	Closed/PCC
Dekalb Co.-BFI-East DeKalb Landfill	044-049D(C&D)	DeKalb	SW- Construction & Demolition Landfill	Closed/PCC
DeKalb Co-Seminole Rd Ph 2 (SL)	044-037D(SL)	DeKalb	SW- Construction & Demolition Landfill	Closed/PCC
Donalsonville - SR 39 (SL)	125-003D(SL)	Seminole	SW- Municipal Solid Waste Landfill	Closed/PCC
Donzi Lane Landfill	044-044D(L)	DeKalb	SW- Construction & Demolition Landfill	Closed/PCC
Douglas Co - Cedar Mtn Rd (SL)	048-007D(SL)	Douglas	SW- Municipal Solid Waste Landfill	Archived
Douglas Co-Cedar Mt/Worthan Rd Ph 1 (SL)	048-009D(SL)	Douglas	SW- Construction & Demolition Landfill	Operating
Early Co - CR135 MSWL	049-007D(SL)	Early	SW- Municipal Solid Waste Landfill	Released
Emory - Old Briarclif Rd L	044-036D(L)	DeKalb	SW- Construction & Demolition Landfill	Archived
Forsyth Co - Hightower Rd Ph 1 (SL)	058-006D(SL)	Forsyth	SW- Municipal Solid Waste Landfill	Closed/PCC
Forsyth Co - Hightower Rd Ph 3 (SL)	058-009D(SL)	Forsyth	SW- Municipal Solid Waste Landfill	Closed/PCC
Forsyth Co - Hightower Rd Ph 4 MSWL	058-010D(SL)	Forsyth	SW- Municipal Solid Waste Landfill	Closed/PCC

Facility Name	Permit Number	County	Interest Type	Operating Status
Forsyth Co - Kelly Mill Rd Site #2 (SL)	058-004D(SL)	Forsyth	SW- Municipal Solid Waste Landfill	Archived
Ft. Benning - 1st Division Rd. (SL)	026-004D(SL)	Chattahoochee	SW- Municipal Solid Waste Landfill	Closed/PCC
Fulton Co - Merk Rd (SL)	060-011D(SL)	Fulton	SW- Municipal Solid Waste Landfill	Closed/PCC
Fulton Co - Morgan Falls (SL)	060-007D(SL)	Fulton	SW- Municipal Solid Waste Landfill	Closed/PCC
GA Power - Plant Yates (LI)	-	Coweta	SW- Private Industrial Landfill	-
GA Power - Plant Yates (LI) -Gypsum	-	Coweta	SW- Private Industrial Landfill	-
Gainesville Waste and Recycling, LLC	069-017D(C&D)	Hall	SW- Construction & Demolition Landfill	Operating
General Chemical Corp	-	Fulton	SW- Private Industrial Landfill	-
Georgia Pacific Plywood Plant, SR370	-	Early	SW- Private Industrial Landfill	-
Georgia Pacific Warm Springs Plywood Plant	-	Meriwether	SW- Private Industrial Landfill	-
Georgia Power - Plant Wansley Steam Plant	-	Heard	SW- Private Industrial Landfill	-
Georgia-Pacific Cedar Springs LLC	-	Early	SW- Private Industrial Landfill	-
GFL Environmental/Safeguard Landfill	060-088D(C&D)	Fulton	SW- Construction & Demolition Landfill	Operating
Great Southern Paper Co. - Primary Clarifier Sludge Monofill	-	Early	SW- Private Industrial Landfill	-
Greenleaf Recycling, LLC	058-013D(C&D)	Forsyth	SW- Construction & Demolition Landfill	Operating
Gwinnett County Construction	067-024D(SL)	Gwinnett	SW- Municipal Solid Waste Landfill	Closed/PCC
Habersham Co - Pea Ridge Rd Ph 1 (SL)	068-016D(SL)	Habersham	SW- Municipal Solid Waste Landfill	Closed/PCC
Habersham Co - Pea Ridge Rd Ph 2&3 (SL)	068-017D(SL)	Habersham	SW- Municipal Solid Waste Landfill	Closed/PCC
Habersham Solid Waste Department	068-020D(SL)	Habersham	SW- Municipal Solid Waste Landfill	Operating
Hall Co - Allen Creek Ph A (SL)	069-008D(SL)	Hall	SW- Municipal Solid Waste Landfill	In-Closure
Hall Co - Candler Rd (SR 60)	069-015D(MSWL)	Hall	SW- Municipal Solid Waste Landfill	Operating
Hamil - Brumbelow Rd (L)	060-054D(L)	Fulton	SW- Construction & Demolition Landfill	In-Closure
Harris Co - Hamilton Rd E (SL)	072-009D(SL)	Harris	SW- Municipal Solid Waste Landfill	Closed/PCC
Heard Co - Frolona Rd (SL)	074-004D(SL)	Heard	SW- Municipal Solid Waste Landfill	Closed/PCC
Hogansville - Blue Creek Rd (SL)	141-009D(SL)	Troup	SW- Municipal Solid Waste Landfill	Archived
Honea- C & R Landfill Francis Rd (L)	060-059D(L)	Fulton	SW- Construction & Demolition Landfill	Closed/PCC

Facility Name	Permit Number	County	Interest Type	Operating Status
ITT /Camp Frank Merrill	093-005D(SL)	Lumpkin	SW- Municipal Solid Waste Landfill	In-Closure
Kendrick - Arnold Mill Rd Ph 1 (L)	028-013D(L)	Cherokee	SW- Construction & Demolition Landfill	Archived
Kuykendall - Earney Rd (L)	028-032D(L)	Cherokee	SW- Construction & Demolition Landfill	Archived
LaGrange - Orchard Hill Rd (SL)	141-005D(SL)	Troup	SW- Municipal Solid Waste Landfill	Archived
Longleaf Energy Associates, LLC	-	Early	SW- Private Industrial Landfill	-
Lumpkin County Landfill	093-003D(SL)	Lumpkin	SW- Municipal Solid Waste Landfill	Closed/PCC
Marion Co - Mt Zion Ch Rd Ph 1,2(SL)&3 Inert	096-002D(SL)	Marion	SW- Municipal Solid Waste Landfill	Closed/PCC
Mead Souther Wood Products	-	Meriwether	SW- Private Industrial Landfill	-
Meriwether Co - CR 98 Durand (SL)	099-015D(SL)	Meriwether	SW- Municipal Solid Waste Landfill	Closed/PCC
Meriwether Co - Whit Waddell Rd #2 (SL)	099-014D(SL)	Meriwether	SW- Municipal Solid Waste Landfill	Archived
Meriwether Co - Whit Waddell Rd (SL)	099-006D(SL)	Meriwether	SW- Municipal Solid Waste Landfill	Permit Appealed
Meriwether Co - Whit Waddell Rd S (SL)	099-011D(SL)	Meriwether	SW- Municipal Solid Waste Landfill	Archived
MERK RD LANDFILL	060-064D(SL)	Fulton	SW- Municipal Solid Waste Landfill	Closed/PCC
Miller/Trammel - Trammel Rd (L) - [Permit Revoked - See Comments]	058-007D(L)	Forsyth	SW- Construction & Demolition Landfill	Permit Revoked
Pattillo - Mtn Ind Blvd Ph 2 & 3 (L)	044-032D(L)	DeKalb	SW- Construction & Demolition Landfill	Closed/PCC
Paulding Co - Gulledge Rd N Tract 1 (SL)	110-005D(SL)	Paulding	SW- Construction & Demolition Landfill	Operating
Phillips-Scales Rd C&D (L)	044-046D(C&D)	DeKalb	SW- Construction & Demolition Landfill	Abandoned
Pine Bluff Landfill	028-039D(SL)	Cherokee	SW- Municipal Solid Waste Landfill	Operating
Price - Cleveland Ave (L)	060-029D(L)	Fulton	SW- Construction & Demolition Landfill	Abandoned
Price - Roosevelt Hwy (L)	060-075D(L)	Fulton	SW- Construction & Demolition Landfill	Released
Quitman County Landfill	118-002D(SL)	Quitman	SW- Municipal Solid Waste Landfill	Closed/PCC
R&B Landfill (Site 1)	006-006D(SL)	Banks	SW- Municipal Solid Waste Landfill	Closed/PCC
R&B Landfill (Site 2)	006-009D(MSWL)	Banks	SW- Municipal Solid Waste Landfill	Operating
Randolph Co - Brooksville Rd Ph 1 (SL)	120-002D(SL)	Randolph	SW- Municipal Solid Waste Landfill	Closed/PCC
Randolph County Yard Trimmings Landfill	PBR-120-07YTL	Randolph	SW- Yard Trimming Landfill	Operating
Richland Creek Road Sanitary Landfill	067-032D(SL)	Gwinnett	SW- Municipal Solid Waste Landfill	Operating

Facility Name	Permit Number	County	Interest Type	Operating Status
Rogers Lake Road C&D Landfill	044-041D(L)	DeKalb	SW- Construction & Demolition Landfill	Closed/PCC
RTS Landfill	069-014D(C&D)	Hall	SW- Construction & Demolition Landfill	In-Closure
Seminole Road Landfill	044-039P(SH)	DeKalb	SW- Other-Processor/ Disposal	Closed/PCC
Sonoco Products Co	-	Fulton	SW- Private Industrial Landfill	-
Southern States - Bolton Rd (Sl)	060-010D(SL)	Fulton	SW- Municipal Solid Waste Landfill	Closed/PCC
Southwire Company	PBR-022-13OSP	Carroll	SW- Other-PBR	Operating
Stewart County Landfill	128-001D(SL)	Stewart	SW- Municipal Solid Waste Landfill	Closed/PCC
Stewart County Yard Trimmings Landfill	PBR-128-08YTL	Stewart	SW- Yard Trimming Landfill	Operating
Sugar Hill - Appling Rd Ph 1 (SL)	067-016D(SL)	Gwinnett	SW- Municipal Solid Waste Landfill	Closed/PCC
Swims - SR 92 (Dixie) Ph 1&2 (L)	028-030D(L)	Cherokee	SW- Construction & Demolition Landfill	Archived
Swims - SR 92 (Dixie) Ph 3 (L)	028-034D(L)	Cherokee	SW- Construction & Demolition Landfill	In-Closure
Talbot Co - Adams St (SL)	130-005D(SL)	Talbot	SW- Municipal Solid Waste Landfill	Archived
Talbot Co - CR 65 #2 (SL)	130-006D(SL)	Talbot	SW- Municipal Solid Waste Landfill	Closed/PCC
Taylor Co - SR 137 Butler (SL)	133-002D(SL)	Taylor	SW- Municipal Solid Waste Landfill	Closed/PCC
Troup Co - SR 109 Mountville MSW Landfill	141-008D(SL)	Troup	SW- Municipal Solid Waste Landfill	Closed/PCC
Troup Co - Warner Rd S (SL)	141-012D(SL)	Troup	SW- Municipal Solid Waste Landfill	Archived
Troup County C&D Landfill	141-023D(SL)	Troup	SW- Construction & Demolition Landfill	Operating
Turkey Run Landfill	099-019D(MSWL)	Meriwether	SW- Municipal Solid Waste Landfill	Operating
Union Co - Haralson Memorial Dr (SL)	144-001D(SL)	Union	SW- Municipal Solid Waste Landfill	Closed/PCC
United Waste - Westview Ph 2 (SL)	060-062D(SL)	Fulton	SW- Municipal Solid Waste Landfill	Closed/PCC
Waste Pro of GA, Inc d/b/a Cherokee C&D Landfill	028-043D(C&D)	Cherokee	SW- Construction & Demolition Landfill	Operating
West Point - SR 103 (SL)	072-003D(SL)	Harris	SW- Municipal Solid Waste Landfill	Archived
White Co - Dukes Creek (SL)	154-003D(SL)	White	SW- Municipal Solid Waste Landfill	Closed/PCC
WI Taylor County Disposal, LLC	133-003D(SL)	Taylor	SW- Municipal Solid Waste Landfill	Operating
WILLIAM L BONNELL CO	-	Coweta	SW- Private Industrial Landfill	-
Willow Oak Landfill	060-089D(C&D)	Fulton	SW- Construction & Demolition Landfill	Operating

Facility Name	Permit Number	County	Interest Type	Operating Status
WMI - B J Landfill Expansion (SL)	067-025D(SL)	Gwinnett	SW- Municipal Solid Waste Landfill	Closed/PCC
WMI-Live Oak #1 (SL)	044-035D(SL)	DeKalb	SW- Municipal Solid Waste Landfill	Closed/PCC
WMI-Live Oak #2 (SL)	044-047D(MSWL)	DeKalb	SW- Municipal Solid Waste Landfill	Closed/PCC

Source: Land Protection Branch, GA EPD, 2022

4.0 ANALYTICAL APPROACH

The process of developing bacteria TMDLs for the Chattahoochee River Basin listed segments includes the determination of the following:

- The current critical bacteria load to the stream under existing conditions;
- The TMDL for similar conditions under which the current load was determined; and
- The percent reduction in the current critical bacteria load necessary to achieve the TMDL.

The calculation of the bacteria load at any point in a stream requires the bacteria concentration and stream flow. The Loading Curve Approach was used to determine the current bacteria load and the TMDL. For the listed segments, fecal coliform sampling data were sufficient to calculate at least one 30-day geometric mean to compare with the regulatory criteria (see Appendix A).

4.1 Loading Curve Approach

For segments with TMDLs being revised, listings of some segments were based on spill data that is no longer available. Therefore, a current critical load and percent reduction cannot be determined. However, the annual average flow determined using USGS StreamStats, (USGS, 2017) was used to calculate the TMDL. The StreamStats annual average flow for each stream with a revised TMDL is given in Table A-1 in Appendix A.

For those segments in which sufficient water quality data were collected to calculate at least one 30-day geometric mean above the water quality criteria, the loading curve approach was used to calculate the current critical load.

The TMDLs for this document were calculated using data from nearby USGS gages and the applicable water quality criterion. These nearby stream gages have relatively similar watershed characteristics, including land use, slope, and drainage area. The stream flows were estimated by multiplying the measured stream flow by the ratio of the listed stream drainage area to the gaged stream drainage area. Table 14 provides the USGS stream gages used to estimate the flow for the listed stream segments. The current critical load was compared to summer and winter seasonal TMDL curves to determine the required percent reduction.

Table 14: USGS Flow Gages Used to Estimate Stream Flow in the 303(d) Listed Segments in the Chattahoochee River Basin

Waterbody Name	Location	Assessment Unit ID	Waterbody Drainage Area (sq miles)	USGS Station No.	USGS Station Name	Flow Gage Drainage Area (sq miles)
Anneewakee Creek	Lake Monroe to Chattahoochee River	GAR031300020304	30.04	02337410	Dog River At Ga 5, Near Fairplay, Ga	66.5
Brush Creek	Tributary to West Point Lake	GAR031300020605	19.99	02338523	Hillabahatchee Creek At Thaxton Rd, Nr Franklin,Ga	16.8
Chattahoochee River	Dicks Creek to Johns Creek	GAR031300010913	1186.18	02335000	Chattahoochee River At Medlock Bridge Rd, Near Norcross, Ga	1170
Coheelee Creek	Chancy Mill Creek to Chattahoochee River	GAR031300040502	21.01	02343940	Sawhatchee Creek At Sr 273, Near Cedar Springs, Ga	64.2
Cooper Creek	Headwaters to Bull Creek - Columbus	GAR031300030107	9.92	02341800	Upatoi Creek At Red Arrow Rd, Near Columbus, Ga	342
Crawford Creek	Headwaters to Sulphur Creek	GAR031300021010	19.22	02338840	Yellowjacket Creek-Hammett Rd, Blw Hogansville, Ga	91
Deer Creek	Headwaters to Centralhatchee Creek	GAR031300020422	11.34	02338523	Hillabahatchee Creek At Thaxton Rd, Nr Franklin,Ga	16.8
Denny Creek	Headwaters to Centralhatchee Creek	GAR031300020433	3.48	02338523	Hillabahatchee Creek At Thaxton Rd, Nr Franklin,Ga	16.8
Dozier Creek	Headwaters to Randall Creek	GAR031300030311	8.49	02341800	Upatoi Creek At Red Arrow Rd, Near Columbus, Ga	342
East Trammel Branch	Headwaters to Yellowjacket Creek	GAR031300020716	3.06	02338840	Yellowjacket Creek-Hammett Rd, Blw Hogansville, Ga	91
Flatrock Creek	Tributary to Bull Creek - Columbus	GAR031300030110	9.31	02341800	Upatoi Creek At Red Arrow Rd, Near Columbus, Ga	342
Fort Creek	Headwaters to Dowdell Creek	GAR031300021216	3.41	02338840	Yellowjacket Creek-Hammett Rd, Blw Hogansville, Ga	91
Glade Branch	Headwaters to Town Creek	GAR031300010514	1.31	02333500	Chestatee River At Sr 52 Near Dahlonega, Ga	153
Hannahatchee Creek	Ben Owens Creek to Bussey Branch	GAR031300030704	26.06	02342850	Hannahatchee Creek At Union Road, At Union, Ga	121
Hillabahatchee Creek	Alabama State line to Red Oak Creek	GAR031300020613	10.07	02338523	Hillabahatchee Creek At Thaxton Rd, Nr Franklin,Ga	16.8

Waterbody Name	Location	Assessment Unit ID	Waterbody Drainage Area (sq miles)	USGS Station No.	USGS Station Name	Flow Gage Drainage Area (sq miles)
Hillabahatchee Creek	Red Oak Creek to Tollieson Branch, Franklin	GAR031300020614	69.02	02338523	Hillabahatchee Creek At Thaxton Rd, Nr Franklin,Ga	16.8
House Creek	Headwaters to Sand Creek	GAR031300021015	30.68	02338840	Yellowjacket Creek-Hammett Rd, Blw Hogansville, Ga	91
Lick Log Creek	Lake Romona to Mill Creek	GAR031300020218	21.68	02336840	Sweetwater Creek,Brownsville Rd,Powder Springs,Ga	97.7
Milligan Creek	Headwaters to Pond 0.9 miles upstream of the Heard County Line	GAR031300020428	4.50	02338523	Hillabahatchee Creek At Thaxton Rd, Nr Franklin,Ga	16.8
North Prong Kolomoki Creek	Tributary 1 mile downstream of Bluffton Highway to Kolomoki Creek	GAR031300040205	24.66	02353400	Pachitla Creek At Sr 37 Near Edison, Ga	181
Pataula Creek	Beaver Creek to Brier Creek	GAR031300031507	73.84	02343225	Pataula Creek At Sr 50 Near Georgetown, Ga	295
Sand Creek	Headwaters to House Creek	GAR031300021018	8.35	02338840	Yellowjacket Creek-Hammett Rd, Blw Hogansville, Ga	91
Standing Boy Creek	Striblin Creek to Mobleys Lake	GAR031300021308	25.25	02341800	Upatoi Creek At Red Arrow Rd, Near Columbus, Ga	342
Tar River	Headwaters to Montarella Lake	GAR031300030204	3.08	02341800	Upatoi Creek At Red Arrow Rd, Near Columbus, Ga	342
Tate Creek	Headwaters to Chestatee River	GAR031300010512	5.23	02333500	Chestatee River At Sr 52 Near Dahlonega, Ga	153
Town Branch	Lake Val-Do Mar to Mud Creek - Villa Rica	GAR031300020211	5.77	02337410	Dog River At Ga 5, Near Fairplay, Ga	66.5
Town Creek	Alabama State line to tributary 0.5 miles upstream of Arrington Rd	GAR031300020611	4.93	02338523	Hillabahatchee Creek At Thaxton Rd, Nr Franklin,Ga	16.8
Town Creek	Tributary 0.5 miles upstream of Arrington Rd to Little Creek	GAR031300020612	12.34	02338523	Hillabahatchee Creek At Thaxton Rd, Nr Franklin,Ga	16.8
Tributary to Bull Creek	Headwaters to Bull Creek	GAR031300030121	1.25	02341800	Upatoi Creek At Red Arrow Rd, Near Columbus, Ga	342

Waterbody Name	Location	Assessment Unit ID	Waterbody Drainage Area (sq miles)	USGS Station No.	USGS Station Name	Flow Gage Drainage Area (sq miles)
Tributary to Cemochechobee Creek	Headwaters to Cemochechobee Creek	GAR031300040107	2.31	02343225	Pataula Creek At Sr 50 Near Georgetown, Ga	295
Tributary to Lick Log Creek	Headwaters to Lick Log Creek	GAR031300020224	0.94	02336840	Sweetwater Creek,Brownsville Rd,Powder Springs,Ga	97.7
Tributary to Mountain Creek	Callaway Gardens WPCP to Mountain Creek	GAR031300021103	1.23	02338840	Yellowjacket Creek-Hammett Rd, Blw Hogansville, Ga	91
Tributary to Mulberry Creek	Headwaters to Oak View Home WPCP	GAR031300021220	0.06	02341800	Upatoi Creek At Red Arrow Rd, Near Columbus, Ga	342
Tributary to Mulberry Creek	Oak View Home WPCP to Mulberry Creek	GAR031300021219	2.32	02341800	Upatoi Creek At Red Arrow Rd, Near Columbus, Ga	342
White Sulfur Creek	Headwaters to Sulphur Creek	GAR031300021006	26.52	02338840	Yellowjacket Creek-Hammett Rd, Blw Hogansville, Ga	91
Whitewater Creek	Headwaters to tributary 0.5 miles upstream Heard/Troup County Line	GAR031300020804	11.10	02338523	Hillabahatchee Creek At Thaxton Rd, Nr Franklin,Ga	16.8
Whitewater Creek	Tributary 0.5 miles upstream Heard/Troup County Line to West Point Lake	GAR031300020805	22.07	02338523	Hillabahatchee Creek At Thaxton Rd, Nr Franklin,Ga	16.8

The current critical loads were determined using fecal coliform data collected within a 30-day period to calculate the geometric means and multiplying these values by the arithmetic means of the flows measured at the time the water quality samples were collected. Georgia's instream bacteria criteria are based on a geometric mean of samples collected over a 30-day period, with samples collected at least 24 hours apart. To reflect this in the load calculation, the bacteria loads are expressed as 30-day accumulated loads with units of counts per 30 days. This is described by the equation below:

$$L_{critical} = C_{geomean} \times Q_{mean}$$

Where:

$L_{critical}$ = current critical bacteria load
$C_{geomean}$ = bacteria concentration as a 30-day geometric mean
Q_{mean} = stream flow as an arithmetic mean

The current estimated critical load is dependent on the fecal coliform concentrations and stream flows measured during the sampling events. The number of events sampled is usually 16 per year. Thus, these loads do not represent the full range of flow conditions or loading rates that can occur. Therefore, it must be kept in mind that the current critical loads used only represent the worst-case scenario that occurred during the sampling period.

The maximum bacteria load at which the instream bacteria criteria will be met can be determined using a variation of the equation above. By setting C equal to the seasonal, instream bacteria criteria, the load will equal the TMDL. However, the TMDL is dependent on stream flow. Figures in Appendix A graphically illustrate that the TMDL is a continuum for the range of flows (Q) that can occur in the stream over time. There are two TMDL curves shown in these figures. One represents the summer TMDL for the period May through October when the 30-day geometric mean criteria is 200 counts/100 mL. The second curve represents the winter TMDL for the period November through April when the 30-day geometric mean criteria is 1,000 counts/100 mL. The equations for these two TMDL curves are:

$$TMDL_{summer} = 200 \text{ counts/100 mL (as a 30-day geometric mean)} \times Q$$

$$TMDL_{winter} = 1{,}000 \text{ counts/100 mL (as a 30-day geometric mean)} \times Q$$

The graphs show the relationship between the current critical load ($L_{critical}$) and the TMDL. The TMDL for a given stream segment is the load for the mean flow corresponding to the current critical load. This is the point where the current load exceeds the TMDL curve by the greatest amount. This critical TMDL can be represented by the following equation:

$$TMDL_{critical} = C_{standard} \times Q_{mean}$$

Where:

$TMDL_{critical}$ = critical bacteria TMDL load
$C_{standard}$ = seasonal bacteria criteria (as a 30-day geometric mean)
summer - 200 counts/100 mL as fecal coliform
winter - 1,000 counts/ 100 mL as fecal coliform
Q_{mean} = stream flow as an arithmetic mean

A 30-day geometric mean load that plots above the respective seasonal TMDL curve represents an exceedance of the instream bacteria criteria. The difference between the current critical load and the TMDL curve represents the load reduction required for the stream segment to meet the appropriate instream bacteria criteria. There is also a single sample maximum criterion of 4,000 counts per 100 mL for fecal coliform. If a single sample exceeds the maximum criterion, and the seasonal geometric mean criteria is also exceeded, then the TMDL is based on the criteria exceedance requiring the largest load reduction.

For future *E. coli* or enterococci TMDLs, one curve will represent the summer TMDL for the period May through October when the 30-day geometric mean criterion is 126 counts/100 mL and 35 counts/100 mL, respectively. The second curve will represent the winter TMDL for the period November through April when the 30-day geometric mean criterion is 265 counts/100 mL or 74 counts/100 mL, respectively. The equations for these two TMDL curves are:

Non-Estuarine waters:

$TMDL_{summer}$ = 126 counts *E. coli* /100 mL (as a 30-day geometric mean) x Q
$TMDL_{winter}$ = 265 counts *E. coli* /100 mL (as a 30-day geometric mean) x Q

Estuarine waters:

$TMDL_{summer}$ = 35 counts enterococci /100 mL (as a 30-day geometric mean) x Q
$TMDL_{winter}$ = 74 counts enterococci /100 mL (as a 30-day geometric mean) x Q

The TMDL for a given stream segment is the load for the mean flow corresponding to the current critical fecal coliform load. This is the point where the current fecal coliform load exceeds the fecal coliform TMDL curve by the greatest amount. This critical TMDL can be represented by the following equation:

$$TMDL_{critical} = C_{standard} \times Q_{mean}$$

Where:

$TMDL_{critical}$ = critical bacteria TMDL load
$C_{standard}$ = seasonal bacteria criteria (as a 30-day geometric mean)
Non-Estuarine waters:
summer – 126 counts/100 mL as *E. coli*
winter – 265 counts/ 100 mL as *E. coli*
Estuarine waters:
summer – 35 counts/100 mL as enterococci
winter – 74 counts/ 100 mL as enterococci
Q_{mean} = stream flow as an arithmetic mean

Under the updated criteria adopted and approved in 2022 there is also a seasonally-based statistical threshold value (STV) maximum criterion established for both non-estuarine and estuarine waters. For the months of May through October the STV criterion for non-estuarine waters is 410 counts per 100 mL for *E.* coli. For the same period, the STV criterion for estuarine waters is 130 counts per 100 mL for enterococci. For the months of November through April the STV criterion for non-estuarine waters is 861 counts per 100 mL for *E.* coli. For the same period, the STV criterion for estuarine waters is 273 counts per 100 mL for enterococci. If a single sample exceeds the STV maximum criterion, and the seasonal geometric mean criteria is also exceeded, then the TMDL is based on the criteria exceedance requiring the largest load reduction.

For a TMDL, the percent load reduction can be expressed as follows:

$$\text{Percent Load Reduction} = \frac{L_{critical} - TMDL_{critical}}{L_{critical}} \times 100$$

The current critical loads and the TMDLs are expressed as equations that show the loads as a function of the total flow at any given time. The general equations for the critical load and the TMDL are:

$$L_{critical} = Q_{total} \times C_{geomean}$$

Where:

$L_{critical}$ = current critical bacteria load
$C_{geomean}$ = bacteria concentration as a 30-day geometric mean
Q_{total} = stream flow

$$TMDL = C_{criterion} \times Q_{total}$$

Where:

TMDL = total maximum daily load
$C_{criterion}$ = criterion
Q_{total} = estimated instantaneous flow

5.0 TOTAL MAXIMUM DAILY LOAD

A Total Maximum Daily Load (TMDL) is the amount of a pollutant that can be assimilated by the receiving waterbody without exceeding the applicable water quality criteria. In this case, it is the seasonal bacteria criteria. A TMDL is the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAS) for nonpoint sources, as well as natural background (40 CFR 130.2) for a given waterbody. The TMDL must also include a margin of safety (MOS), either implicitly or explicitly, that accounts for the uncertainty in the relationship between pollutant loads and the water quality response of the receiving waterbody. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measures. For bacteria, the TMDLs are expressed as counts per 30 days as a geometric mean.

A TMDL is expressed as follows:

$$TMDL = \Sigma WLAs + \Sigma LAs + MOS$$

The TMDL calculates the WLAs and LAs with a margin of safety to meet the stream's water quality standards. The allocations are based on estimates that use the best available data and provide the basis to establish or modify existing controls so that water quality standards can be achieved. In developing a TMDL, it is important to consider whether adequate data are available to identify the sources, and to understand the fate and transport of the pollutant(s) to be controlled.

TMDLs may be developed using a phased approach. Under a phased approach, the TMDL includes: 1) WLAs that confirm existing limits and controls or lead to new limits, and 2) LAs that confirm existing controls or include implementing new controls (USEPA, 1991). A phased TMDL requires additional data be collected to determine if load reductions required by the TMDL are leading to the attainment of water quality standards.

Watershed-based plans may be developed to address and assess both point and nonpoint sources. These plans establish a schedule or timetable for the installation and evaluation of source control measures, data collection, and assessment of water quality standard attainment. Future monitoring of the listed segments water quality may be used to evaluate this phase of the TMDL, and if necessary, to reallocate the loads.

The existing fecal coliform loads calculated for each listed stream segment are based on sampling data and measured or estimated flows and represent the sum of the total loads from all point and nonpoint sources for the segment. In situations where two or more adjacent segments are listed, the fecal coliform loads to each segment are individually evaluated on a localized watershed basis. The following sections describe the various bacteria TMDL components.

5.1 Wasteload Allocations

5.1.1 Wastewater Treatment Facilities

The wasteload allocation (WLA) is the portion of the receiving water's loading capacity that is allocated to existing or future point sources. WLAs are provided to the point sources from POTW and Non-POTW wastewater treatment systems with NPDES end-of-pipe effluent limits established to meet the applicable water quality standard. In addition, the permits include routine monitoring and reporting requirements.

For facilities that currently have a bacteria effluent limit, the permit information, receiving stream, impaired stream and WLAs are provided in Table 15. This information is provided for facilities that discharge into or within 25 miles upstream of the listed segment. In most cases, the WLAs are calculated based on permitted or design flow and permitted bacteria concentration. However, for those facilities whose wastewater is reused, the bacteria limit to discharge into surface waters may be overly restrictive and for these facilities the WLA is calculated using the permitted flow and permitted bacteria concentration. This was expressed as an accumulated load over a 30-day period and presented in units of counts per 30 days. If there is a new facility or a facility expands its capacity and the permitted flow increases, the wasteload allocation for the facility will be the permitted flow times the appropriate water quality criteria, either 200 counts/100 mL for fecal coliform, 126 counts/100 mL for E. coli in non-estuarine waters, or 35 counts/100mL for enterococci in estuarine waters as a 30-day geometric mean.

Table 15: WLAs for the Facilities that Currently have Bacteria Limits in the Chattahoochee River Basin

Facility Name	NPDES Permit No.	Receiving Stream	Listed Stream Segment	Bacterial Indictor	WLA (counts/ 30 days)	30 Day Geometric Mean Concentration (counts/100mL)
ABP Enterprises, LLC (Arbor Village WPCP)	GA0031526	Unnamed Tributary to Little Anneewakee Creek	Anneewakee Creek GAR031300020304	Fecal coliform	2.34E+07	200
				E. coli	1.48E+07	126
Buford, City of (Southside WPCP)	GA0023167	Suwanee Creek	Chattahoochee River GAR031300010913	Fecal coliform	4.04E+08	23
				E. coli	2.21E+09	126
Buford, City of (Westside WPCP)	GA0023175	Richland Creek	Chattahoochee River GAR031300010913	Fecal coliform	2.93E+08	200
				E. coli	1.84E+08	126
CGR Georgia LLC (Callaway Resort & Gardens WPCP)	GA0022527	Unnamed tributary to Mountain Creek	Tributary to Mountain Creek GAR031300021103	Fecal coliform	5.86E+08	200
				E. coli	3.69E+08	126
Flowery Branch, City of (Flowery Branch WPCP)	GA0031933	Lake Lanier	Chattahoochee River GAR031300010913	Fecal coliform	2.58E+09	200
				E. coli	1.62E+09	126
Forsyth County Department of Water & Sewer (Dick Creek WRF)	GA0038563	Dick Creek	Chattahoochee River GAR031300010913	Fecal coliform	1.02E+08	23
				E. coli	5.61E+08	126
Forsyth County Department of Water and Sewer (Fowler & Shakerag WRF)	GA0038954	Chattahoochee River	Chattahoochee River GAR031300010913	Fecal coliform	1.17E+10	200
				E. coli	7.38E+09	126
Forsyth County Department of Water and Sewer (James Creek WRF)	GA0050238	James Creek	Chattahoochee River GAR031300010913	Fecal coliform	3.43E+08	23
				E. coli	1.88E+09	126

Facility Name	NPDES Permit No.	Receiving Stream	Listed Stream Segment	Bacterial Indictor	WLA (counts/ 30 days)	30 Day Geometric Mean Concentration (counts/100mL)
Gainesville, City of (Flat Creek WRF)	GA0021156	Flat Creek to Lake Sidney Lanier	Chattahoochee River GAR031300010913	Fecal coliform	1.62E+09	23
				E. coli	8.85E+09	126
Greenleaf Investment Partners L026D, LLC (Dixie Mobile Home Park WPCP)	GA0023043	Unnamed Tributary to Flat Creek	Chattahoochee River GAR031300010913	Fecal coliform	5.04E+06	200
				E. coli	3.17E+06	126
Gwinnett County Board of Commissioners (F. Wayne Hill WRC)	GA0038130	Lake Sidney Lanier	Chattahoochee River GAR031300010913	Fecal coliform	5.86E+08	2
				E. coli	3.69E+10	126
Koch Foods of Pine Mountain Valley	GA0001317	Fort Creek	Fort Creek GAR031300021216	Fecal coliform	1.03E+09 [a]	200[a]
				E. coli	6.49E+08 [a]	126 [a]
Lanier Islands Resort (Lake Lanier Islands Resort WPCP)	GA0049115	Lake Lanier	Chattahoochee River GAR031300010913	Fecal coliform	4.10E+08	200
				E. coli	2.58E+08	126
Oak View Home, Inc (Oak View Home WPCP)	GA0031208	Unnamed tributary to Mulberry Creek	Tributary to Mulberry Creek GAR031300021219	Fecal coliform	1.64E+07	200
				E. coli	1.03E+07	126
R Home Rentals, LLC. (Acres of Shade Mobile Home Park WPCP)	GAG550151	Striblin Creek	Standing Boy Creek GAR031300021308	Fecal coliform	2.64E+06	200
				E. coli	1.66E+06	126
Shady Grove Mobile Home Park WPCP	GA0023469	Unnamed tributary to Balus Creek to Lake Lanier	Chattahoochee River GAR031300010913	Fecal coliform	3.40E+06	200
				E. coli	2.14E+06	126
Villa Rica, City of (North Sweetwater WPCP)	GA0027171	Unnamed tributary to Town Branch	Town Branch GAR031300020211	Fecal coliform	6.09E+08	200
				E. coli	3.84E+08	126
Revised TMDLs						
Cleveland, City of (Cleveland WPCP)	GA0036820	Tesnatee Creek	Chestatee River GAR031300010704	Fecal coliform	8.78E+08	200
				E. coli	5.53E+08	126
Coweta County (Arnall/Sargent WPCP)	GA0000299	Wahoo Creek	Wahoo Creek GAR031300020412	Fecal coliform	7.03E+07	200
				E. coli	4.43E+07	126
Coweta County Water & Sewer Authority (Arnco WPCP)	GA0000311	Wahoo Creek	Wahoo Creek GAR031300020412	Fecal coliform	1.17E+08	200
				E. coli	7.38E+07	126

Facility Name	NPDES Permit No.	Receiving Stream	Listed Stream Segment	Bacterial Indictor	WLA (counts/ 30 days)	30 Day Geometric Mean Concentration (counts/100mL)
Dahlonega, City of (Dahlonega WPCP)	GA0026077	Yahoola Creek	Chestatee River GAR031300010704	Fecal coliform	1.69E+09	200
				E. coli	1.06E+09	126
Forsyth County Department of Water and Sewer (James Creek WRF)	GA0050238	James Creek	Chattahoochee River GAR031300010913	Fecal coliform	3.43E+08	23
				E. coli	1.88E+09	126
Grantville, City of (Pine Street Pond # 2 WPCP)	GA0033201	nnamed tributary to Messiers Creek	New River GAR031300020508	Fecal coliform	4.68E+07	200
				E. coli	2.95E+07	126
Grantville, City of (Meriwether Street WPCP - Pond #3)	GA0033219	Unnamed tributary to Yellow Jacket Creek	Yellowjacket Creek GAR031300020714	Fecal coliform	5.86E+07	200
				E. coli	3.69E+07	126
Haggai Realty LLC (Oak Grove Mobile Home Park WPCP)	GA0034207	Unnamed tributary to Cane Creek	Chestatee River GAR031300010704	Fecal coliform	5.86E+06	200
				E. coli	3.69E+06	126
Hogansville, City of (Hogansville WPCP)	GA0050218	Yellow Jacket Creek	Yellowjacket Creek GAR031300020714	Fecal coliform	1.76E+09	200
				E. coli	1.11E+09	126
Mountain Lakes Water & Sewer Authority, Inc. (Mountain Lake Resort WPCP)	GA0046400	Lake Qualatchee	Chestatee River GAR031300010704	Fecal coliform	1.05E+07	200
				E. coli	6.64E+06	126
Newnan Utilities (Mineral Springs WPCP - NPDES)	GA0021423	Mineral Springs Branch	New River GAR031300020508	Fecal coliform	5.39E+08	23
				E. coli	2.95E+09	126
Newnan Utilities (Wahoo Creek WPCP)	GA0031721	Unnamed tributary to Wahoo Creek	Wahoo Creek GAR031300020412	Fecal coliform	3.51E+09	200
				E. coli	2.21E+09	126
Pentagon Properties, Inc (Cedar Village Manufactured Home Community WPCP)	GA0038512	Unnamed Tributary to Whooping Creek	Whooping Creek GAR031300020430 Whooping Creek GAR031300020431	Fecal coliform	3.86E+07	200
				E. coli	2.43E+07	126
Pine Lakes Mobile Home Park, LLC (Pine Lakes WPCP)	GA0035271	Bear Creek	Bear Creek GAR031300020313	Fecal coliform	5.86E+07	200
				E. coli	3.69E+07	126
Pine Mountain, Town of (Pine Mountain WPCP)	GA0025691	Turkey Creek	Flat Shoals Creek GAR031300021019 Flat Shoals Creek GAR031300021020	Fecal coliform	3.51E+08	200
				E. coli	2.21E+08	126

Facility Name	NPDES Permit No.	Receiving Stream	Listed Stream Segment	Bacterial Indictor	WLA (counts/ 30 days)	30 Day Geometric Mean Concentration (counts/100mL)
Shady Grove Mobile Home Park WPCP	GA0023469	Unnamed tributary to Balus Creek to Lake Lanier	South Fork Balus Creek GAR031300010806	Fecal coliform	3.40E+06	200
				E. coli	2.14E+06	126

Note: [a] -Daily Average

Non-POTW facilities that discharge sanitary wastewater directly or sanitary waste streams commingled with other waste streams will be given a bacteria effluent limit in their permit. Potential WLAs for existing Non-POTW permittees without bacteria permit limits would be the facility design flow multiplied by the appropriate bacteria criterion, either 200 counts/100 mL for fecal coliform, 126 counts/100 mL for E. coli in non-estuarine waters, or 35 counts/100mL for enterococci in estuarine waters as a 30-day geometric mean. For these facilities, it is not known if their discharge contains any bacteria at levels that would exceed the instream water quality criteria because of the type of treatment processes employed. Therefore, existing Non-POTW facilities may be required to submit bacteria data with their NPDES permit renewal application. Non-POTW permittees must collect, analyze, and submit appropriate bacteria data from at least 4 samples collected 24 hours apart within a 30-day period. GA EPD will evaluate these data and determine if a permit limit for bacteria is needed. There are currently four (4) known existing Non-POTW discharges without bacteria permit limits in the contributing watersheds, as noted in Table 7.

5.1.2 Regulated Stormwater Discharges

State and Federal Rules define stormwater discharges covered by NPDES permits as point sources. However, stormwater discharges are from diffuse sources and there are multiple stormwater outfalls. Stormwater sources (point and nonpoint) are different than traditional NPDES permitted sources in four respects: 1) they do not produce a continuous (pollutant loading) discharge; 2) their pollutant loading depends on the intensity, duration, and frequency of rainfall events, over which the permittee has no control; 3) the activities contributing to the pollutant loading may include the various allowable activities of others, and control of these activities is not solely within the discretion of the permittee; and 4) they do not have wastewater treatment plants that control specific pollutants to meet numerical limits.

The intent of stormwater NPDES permits is not to treat the water after collection, but to reduce the exposure of stormwater to pollutants by implementing various controls. It would be infeasible and prohibitively expensive to control pollutant discharges from each stormwater outfall. Therefore, stormwater NPDES permits require the establishment of controls or BMPs to reduce the pollutants entering the environment.

The wasteload allocations from stormwater discharges (WLAsw) associated with MS4s are estimated based on the percentage of urban area in each watershed covered by the MS4 stormwater permit. At this time, the portion of each watershed that goes directly to a permitted storm sewer or is non-permitted sheet flow or diffuse runoff has not been clearly defined. Thus, it is assumed that approximately 70 percent of stormwater runoff from the regulated urban area is collected by the MS4s. This can be represented by the following equation:

$$WLA_{SW} = Q_{WLAsw} \times C_{standard}$$

where: WLA_{SW} = Wasteload Allocation for permitted stormwater runoff from all MS4 urban areas
Q_{WLAsw} = Runoff from all MS4 urban areas conveyed through permitted storm water structures
$Q_{WLAsw} = \Sigma Q_{urban} \times 0.7$
ΣQ_{urban} = Sum of all stormwater runoff from MS4 urban
$C_{standard}$ = seasonal criteria as appropriate (as a 30-day geometric mean)
summer – 200 counts/100 mL as fecal coliform
winter – 1000 counts/ 100 mL as fecal coliform
summer – 126 counts/100 mL as *E. coli*
winter – 265 counts/ 100 mL as *E. coli*
summer – 35 counts/100 mL as enterococci
winter – 74 counts/ 100 mL as enterococci

For stormwater permits, compliance with the terms and conditions of the permit is effective implementation of the WLA to the Maximum Extent Practicable (MEP) and demonstrates consistency with the assumptions and requirements of the TMDL. GA EPD acknowledges that progress with the assumptions and requirements of the TMDL by stormwater permittees may take one or more permit iterations. Achieving the TMDL reductions may constitute compliance with a SWMP or a SWPPP, provided the MEP definition is met, even where the numeric percent reduction may not be achieved so long as reasonable progress is made toward attainment of water quality standards using an iterative BMP process.

5.1.3 Concentrated Animal Feeding Operations

Wet manure facilities are either included under a State-issued LAS General Permit or an NPDES General Permit. A small number of wet manure operations have an individual NPDES permit. Dry manure facilities are not required to obtain permits. None of the wet manure or dry manure facilities have discharges. Presently, there are no permitted CAFOs located in the watersheds of the listed segments in the Chattahoochee River Basin, and therefore no WLAs were provided.

5.2 Load Allocations

The load allocation is the portion of the receiving water's loading capacity that is attributed to existing or future nonpoint sources or to natural background sources. Nonpoint sources are identified in 40 CFR 130.6 as follows:

- Residual waste;
- Land disposal;
- Agricultural and silvicultural;
- Mines;
- Construction;
- Saltwater intrusion; and
- Urban stormwater (non-permitted).

The LA is calculated as the remaining portion of the TMDL load available, after allocating the WLA, WLAsw, and the MOS, using the following equation:

$$LA = TMDL - (S\ WLA + S\ WLAsw + MOS)$$

As described above, there are two types of load allocations: loads to the stream independent of precipitation, including sources such as failing septic systems, leachate from landfills, animals in the stream, leaking sewer system collection lines, and background loads; and loads associated with bacteria accumulation on land surfaces that is washed off during storm events, including runoff from saturated LAS fields. Currently, it is not possible to partition the various sources of load allocations. In the future, after additional data has been collected, it may be possible to partition the load allocation by source.

5.3 Seasonal Variation

The Georgia bacteria criteria for waterbodies with the designated use of drinking water, fishing , and coastal fishing are seasonal. One set of criteria applies to the summer season, while a different set applies to the winter season. To account for seasonal variations, the critical loads for each listed segment were determined from sampling data obtained during both summer and winter seasons, when possible. The TMDL and percent reduction for each listed segment is based on the season in which the critical load occurred. The TMDLs for each season, for any given flow, are presented as equations in Section 5.5.

5.4 Margin of Safety

The MOS is a required component of TMDL development. There are two basic methods for incorporating the MOS: 1) implicitly incorporate the MOS using conservative modeling assumptions to develop allocations; or 2) explicitly specify a portion of the TMDL as the MOS and use the remainder for allocations. For this TMDL, an explicit MOS of 10 percent of the TMDL was used.

5.5 Total Bacteria Load

The bacteria TMDL for the listed stream segment is dependent on the time of year, the stream flow, and the applicable state water quality criteria. In January 2022, the Georgia DNR Board adopted new bacteria criteria for “Fishing” and “Drinking Water” designated uses using the bacterial indicators *E. coli* and enterococci. These bacteria are better indicators for human health illnesses. The adopted criteria have the same estimated illness rate (8 per 1000 swimmers) as the previously established fecal coliform criteria. Since this TMDL is based on fecal coliform data, but the current bacteria criterion is *E. coli* or enterococci, this TMDL will use both fecal coliform and the appropriate indicator identified above based on estuarine/non-estuarine status.

The total maximum daily seasonal fecal coliform loads for Georgia are given below:

$TMDL_{summer}$ = 200 counts/100 mL (as a 30-day geometric mean) x Q

$TMDL_{winter}$ = 1000 counts/100 mL (as a 30-day geometric mean) x Q

TMDL = 4000 counts/100 mL (instantaneous) x Q

The total maximum daily seasonal *E. coli* loads for non-estuarine waters in Georgia are given below:

$TMDL_{summer\ GEO}$ = 126 counts/100 mL (as a 30-day geometric mean) x Q

$TMDL_{summer\ STV}$ = 410 counts/100 mL (instantaneous) x Q

$TMDL_{winter\ GEO}$ = 265 counts/100 mL (as a 30-day geometric mean) x Q

$TMDL_{winter\ STV}$ = 861 counts/100 mL (instantaneous) x Q

The total maximum daily seasonal enterococci loads for estuarine waters in Georgia are given below:

$TMDL_{summer\ GEO}$= 35 counts/100 mL (as a 30-day geometric mean) x Q

$TMDL_{summer\ STV}$ = 130 counts/100 mL (instantaneous) x Q

$TMDL_{winter\ GEO}$ = 74 counts/100 mL (as a 30-day geometric mean) x Q

$TMDL_{winter\ STV}$ = 273 counts/100 mL (instantaneous) x Q

For purposes of determining necessary load reductions required to meet the instream water quality criteria, the current critical TMDL was determined. This load is the product of the applicable seasonal bacteria criteria and the mean flow used to calculate the current fecal coliform critical load. It represents the sum of the allocated loads from point (WLA and WLA_{sw}) and nonpoint (LA) sources located within the immediate drainage area of the listed segment, and a margin of safety (MOS). For these calculations, the bacteria contributed by a permitted facility to the WLA was the product of the bacteria permit limit concentration and the monthly average permitted flow. The current critical loads and corresponding TMDLs, WLAs (WLA and WLA_{sw}), LAs, MOSs, and percent load reductions for the Chattahoochee River Basin listed stream segments are presented in Table 16.

The relationships of the current critical loads to the TMDLs are shown graphically in Appendix A. The vertical distance between the two values represents the load reductions necessary to achieve the TMDLs. Because of the localized nature of the load evaluations, the calculated bacterial load reductions pertain to point and nonpoint sources occurring within the immediate drainage area of the listed segment. The current critical values represent a worst-case scenario for the limited set of data. Thus, the load reductions required are conservative estimates, and should be sufficient to prevent exceedances of the instream bacteria criteria for a wide range of conditions.

Evaluation of the relationship between instream water quality and the potential sources of pollutant loading is an important component of TMDL development and is the basis for later implementation of corrective measures and BMPs. For the current TMDLs, the association between bacterial loads and the potential sources occurring within the sub-watershed of each segment was examined on a qualitative basis.

Table 16: Bacteria Loads and Required Load Reductions

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300020304	Anneewakee Creek	Lake Monroe to Chattahoochee River	Fecal coliform	4.79E+11	2.34E+07	1.47E+11	1.97E+11	3.83E+10	3.83E+11	20.10%
			E. coli	[3]	1.48E+07	9.26E+10	1.24E+11	2.41E+10	2.41E+11	Undetermined [2]
GAR031300020605	Brush Creek	Tributary to West Point Lake	Fecal coliform	3.42E+11			1.34E+11	1.49E+10	1.49E+11	56.5%
			E. coli	[3]			8.44E+10	9.38E+09	9.38E+10	Undetermined [2]
GAR031300010913	Chattahoochee River	Dicks Creek to Johns Creek	Fecal coliform	1.71E+16	1.81E+10	2.25E+14	4.58E+14	7.58E+13	7.58E+14	95.6%
			E. coli	[3]	5.99E+10	2.30E+13	4.69E+13	7.77E+12	7.77E+13	Undetermined [2]
GAR031300040502	Coheelee Creek	Chancy Mill Creek to Chattahoochee River	Fecal coliform	4.60E+11			5.40E+10	6.00E+09	6.00E+10	87.0%
			E. coli	[3]			3.40E+10	3.78E+09	3.78E+10	Undetermined [2]
GAR031300030107	Cooper Creek	Headwaters to Bull Creek - Columbus	Fecal coliform	6.94E+11		4.76E+10	3.24E+10	8.90E+09	8.90E+10	87.2%
			E. coli	[3]		3.00E+10	2.04E+10	5.61E+09	5.61E+10	Undetermined [2]
GAR031300021010	Crawford Creek	Headwaters to Sulphur Creek	Fecal coliform	2.62E+11			1.40E+11	1.56E+10	1.56E+11	40.7%
			E. coli	[3]			8.82E+10	9.80E+09	9.80E+10	Undetermined [2]
GAR031300020422	Deer Creek	Headwaters to Centralhatchee Creek	Fecal coliform	3.66E+11			7.60E+10	8.45E+09	8.45E+10	77.0%
			E. coli	[3]			4.79E+10	5.32E+09	5.32E+10	Undetermined [2]
GAR031300020433	Denny Creek	Headwaters to Centralhatchee Creek	Fecal coliform	3.57E+10			2.86E+10	3.17E+09	3.17E+10	11.2%
			E. coli	[3]			1.80E+10	2.00E+09	2.00E+10	Undetermined [2]
GAR031300030311	Dozier Creek	Headwaters to Randall Creek	Fecal coliform	7.48E+10		2.46E+09	2.26E+10	2.78E+09	2.78E+10	62.8%
			E. coli	[3]		1.55E+09	1.42E+10	1.75E+09	1.75E+10	Undetermined [2]
GAR031300020716	East Trammel Branch	Headwaters to Yellowjacket Creek	Fecal coliform	9.57E+09			5.13E+09	5.70E+08	5.70E+09	40.4%
			E. coli	[3]			3.23E+09	3.59E+08	3.59E+09	Undetermined [2]
GAR031300030110	Flatrock Creek	Tributary to Bull Creek - Columbus	Fecal coliform	3.42E+11		7.58E+09	2.98E+10	4.15E+09	4.15E+10	87.9%
			E. coli	[3]		4.78E+09	1.87E+10	2.61E+09	2.61E+10	Undetermined [2]
GAR031300021216	Fort Creek	Headwaters to Dowdell Creek	Fecal coliform	8.08E+09	1.03E+09		4.68E+09	6.35E+08	6.35E+09	21.4%
			E. coli	[3]	6.49E+08		2.95E+09	4.00E+08	4.00E+09	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300010514	Glade Branch	Headwaters to Town Creek	Fecal coliform	8.07E+10			1.32E+10	1.47E+09	1.47E+10	81.8%
			E. coli	[3]			8.33E+09	9.25E+08	9.25E+09	Undetermined [2]
GAR031300030704	Hannahatchee Creek	Ben Owens Creek to Bussey Branch	Fecal coliform	1.08E+12			1.35E+11	1.50E+10	1.50E+11	86.1%
			E. coli	[3]			8.51E+10	9.45E+09	9.45E+10	Undetermined [2]
GAR031300020613	Hillabahatchee Creek	Alabama State line to Red Oak Creek	Fecal coliform	1.36E+14			3.06E+12	3.40E+11	3.40E+12	97.5%
			E. coli	[3]			1.93E+12	2.14E+11	2.14E+12	Undetermined [2]
GAR031300020614	Hillabahatchee Creek	Red Oak Creek to Tollieson Branch, Franklin	Fecal coliform	2.33E+13			8.40E+14	9.33E+13	9.33E+14	97.5%
			E. coli	[3]			5.29E+14	5.88E+13	5.88E+14	Undetermined [2]
GAR031300021015	House Creek	Headwaters to Sand Creek	Fecal coliform	1.47E+11			1.57E+10	1.74E+09	1.74E+10	88.1%
			E. coli	[3]			9.86E+09	1.10E+09	1.10E+10	Undetermined [2]
GAR031300020218	Lick Log Creek	Lake Romona to Mill Creek	Fecal coliform	3.40E+11		9.73E+09	1.29E+11	1.54E+10	1.54E+11	54.6%
			E. coli	[3]		6.13E+09	8.15E+10	9.73E+09	9.73E+10	Undetermined [2]
GAR031300020428	Milligan Creek	Headwaters to Pond 0.9 miles upstream of the Heard County Line	Fecal coliform	6.50E+10			3.60E+10	4.00E+09	4.00E+10	38.5%
			E. coli	[3]			2.27E+10	2.52E+09	2.52E+10	Undetermined [2]
GAR031300040205	North Prong Kolomoki Creek	Tributary 1 mile downstream of Bluffton Highway to Kolomoki Creek	Fecal coliform	1.89E+11			9.33E+10	1.04E+10	1.04E+11	45.1%
			E. coli	[3]			5.87E+10	6.53E+09	6.53E+10	Undetermined [2]
GAR031300031507	Pataula Creek	Beaver Creek to Brier Creek	Fecal coliform	1.30E+12			3.84E+11	4.27E+10	4.27E+11	67.1%
			E. coli	[3]			2.42E+11	2.69E+10	2.69E+11	Undetermined [2]
GAR031300021018	Sand Creek	Headwaters to House Creek	Fecal coliform	3.14E+10			4.81E+09	5.34E+08	5.34E+09	83.0%
			E. coli	[3]			3.03E+09	3.37E+08	3.37E+09	Undetermined [2]
GAR031300021308	Standing Boy Creek	Striblin Creek to Mobleys Lake	Fecal coliform	2.95E+12	2.64E+06		3.18E+11	3.54E+10	3.54E+11	88.0%
			E. coli	[3]	1.66E+06		2.01E+11	2.23E+10	2.23E+11	Undetermined [2]
GAR031300030204	Tar River	Headwaters to Montarella Lake	Fecal coliform	1.75E+10			1.28E+10	1.42E+09	1.42E+10	18.5%
			E. coli	[3]			8.08E+09	8.97E+08	8.97E+09	Undetermined [2]
GAR031300010512	Tate Creek	Headwaters to Chestatee River	Fecal coliform	3.57E+10			2.86E+10	3.17E+09	3.17E+10	11.2%
			E. coli	[3]			1.80E+10	2.00E+09	2.00E+10	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300020211	Town Branch	Lake Val-Do Mar to Mud Creek - Villa Rica	Fecal coliform	3.89E+10	6.09E+08	1.50E+10	1.61E+10	3.52E+09	3.52E+10	9.6%
			E. coli	[3]	3.84E+08	9.45E+09	1.01E+10	2.22E+09	2.22E+10	Undetermined [2]
GAR031300020611	Town Creek	Alabama State line to tributary 0.5 miles upstream of Arrington Rd	Fecal coliform	2.03E+13			4.56E+11	5.06E+10	5.06E+11	97.5%
			E. coli	[3]			2.87E+11	3.19E+10	3.19E+11	Undetermined [2]
GAR031300020612	Town Creek	Tributary 0.5 miles upstream of Arrington Rd to Little Creek	Fecal coliform	5.07E+13			1.14E+12	1.27E+11	1.27E+12	97.5%
			E. coli	[3]			7.19E+11	7.99E+10	7.99E+11	Undetermined [2]
GAR031300030121	Tributary to Bull Creek	Headwaters to Bull Creek	Fecal coliform	3.09E+10		2.22E+09	1.31E+09	3.92E+08	3.92E+09	87.3%
			E. coli	[3]		1.40E+09	8.23E+08	2.47E+08	2.47E+09	Undetermined [2]
GAR031300040107	Tributary to Cemochechobee Creek	Headwaters to Cemochechobee Creek	Fecal coliform	2.89E+10			1.79E+10	1.99E+09	1.99E+10	31.2%
			E. coli	[3]			1.13E+10	1.25E+09	1.25E+10	Undetermined [2]
GAR031300020224	Tributary to Lick Log Creek	Headwaters to Lick Log Creek	Fecal coliform	9.97E+09		9.05E+07	8.33E+08	1.03E+08	1.03E+09	0.0%
			E. coli	[3]		5.70E+07	5.25E+08	6.46E+07	6.46E+08	Undetermined [2]
GAR031300021103	Tributary to Mountain Creek	Callaway Gardens WPCP to Mountain Creek	Fecal coliform	6.91E+10	5.86E+08		8.40E+09	9.98E+08	9.98E+09	85.6%
			E. coli	[3]	3.69E+08		5.29E+09	6.29E+08	6.29E+09	Undetermined [2]
GAR031300021219	Tributary to Mulberry Creek	Oak View Home WPCP to Mulberry Creek	Fecal coliform	1.03E+09	1.64E+07		1.78E+08	2.16E+07	2.16E+08	79.0%
			E. coli	[3]	1.03E+07		1.12E+08	1.36E+07	1.36E+08	Undetermined [2]
GAR031300021220	Tributary to Mulberry Creek	Headwaters to Oak View Home WPCP	Fecal coliform	2.18E+10			7.85E+09	8.73E+08	8.73E+09	59.9%
			E. coli	[3]			4.95E+09	5.50E+08	5.50E+09	Undetermined [2]
GAR031300021006	White Sulfur Creek	Headwaters to Sulphur Creek	Fecal coliform	8.36E+11			1.93E+11	2.15E+10	2.15E+11	74.3%
			E. coli	[3]			1.22E+11	1.35E+10	1.35E+11	Undetermined [2]
GAR031300020804	Whitewater Creek	Headwaters to tributary 0.5 miles upstream Heard/Troup County Line	Fecal coliform	7.06E+10			2.30E+10	2.55E+09	2.55E+10	63.8%
			E. coli	[3]			1.45E+10	1.61E+09	1.61E+10	Undetermined [2]
GAR031300020805	Whitewater Creek	Tributary 0.5 miles upstream Heard/Troup County Line to West Point Lake	Fecal coliform	1.40E+11			4.57E+10	5.08E+09	5.08E+10	63.8%
			E. coli	[3]			2.88E+10	3.20E+09	3.20E+10	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
Revised TMDLs[4]										
GAR031300020401	Acorn Creek	Headwaters to the Chattahoochee River	Fecal coliform	5.62E+10			9.20E+10	1.02E+10	1.02E+11	0%
			E. coli	[3]			5.80E+10	6.44E+09	6.44E+10	Undetermined [2]
GAR031300020308	Baldwin Creek	Headwaters to Little Bear Creek	Fecal coliform	3.90E+10		5.76E+09	1.55E+10	2.36E+09	2.36E+10	39%
			E. coli	[3]		3.63E+09	9.76E+09	1.49E+09	1.49E+10	Undetermined [2]
GAR031300020313	Bear Creek	Dorsett Shoals Rd. to Little Bear Creek	Fecal coliform	6.15E+10	5.86E+07	2.64E+10	5.87E+10	9.46E+09	9.46E+10	0%
			E. coli	[3]	3.69E+07	1.66E+10	3.70E+10	5.96E+09	5.96E+10	Undetermined [2]
GAR031300010813	Big Creek	Tributary to Lake Lanier	Fecal coliform	6.07E+10			3.58E+10	3.98E+09	3.98E+10	34%
			E. coli	[3]			2.26E+10	2.51E+09	2.51E+10	Undetermined [2]
GAR031300020310	Billy Creek (Previously Nancy Long Creek/Billy Creek)	Strickland Lake to the Dog River	Fecal coliform	1.60E+10			3.39E+10	3.77E+09	3.77E+10	0%
			E. coli	[3]			2.14E+10	2.38E+09	2.38E+10	Undetermined [2]
GAR031300020420	Cedar Creek	Browns Creek to the Chattahoochee River (Formerly Coweta County)	Fecal coliform	2.91E+10		8.57E+09	3.94E+11	4.47E+10	4.47E+11	0%
			E. coli	[3]		5.40E+09	2.48E+11	2.82E+10	2.82E+11	Undetermined [2]
GAR031300020421	Centralhatchee Creek	Headwaters to the Chattahoochee River	Fecal coliform	3.07E+11			5.03E+11	5.59E+10	5.59E+11	0%
			E. coli	[3]			3.17E+11	3.52E+10	3.52E+11	Undetermined [2]
GAR031300010105	Chattahoochee River	SR255 to Soquee River	Fecal coliform	3.57E+12			2.85E+12	3.17E+11	3.17E+12	11%
			E. coli	[3]			1.80E+12	2.00E+11	2.00E+12	Undetermined [2]
GAR031300010704	Chestatee River	Yahoola Creek to Lake Lanier	Fecal coliform	4.85E+12	2.58E+09		3.79E+12	4.22E+11	4.22E+12	13%
			E. coli	[3]	1.63E+09		2.39E+12	2.66E+11	2.66E+12	Undetermined [2]
GAR031300020709	Dixie Creek	Headwaters to West Point Lake - LaGrange	Fecal coliform	3.07E+10			2.89E+10	3.21E+09	3.21E+10	0%
			Enterococci	[3]			1.82E+10	2.02E+09	2.02E+10	Undetermined [2]
GAR031300031301	Drag Nasty Creek	Tributary to W. F. George	Fecal coliform	2.33E+11			9.11E+10	1.01E+10	1.01E+11	57%
			E. coli	[3]			5.74E+10	6.38E+09	6.38E+10	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300010817	Etta Vista Creek	Tributary to Lake Lanier (Gainesville)	Fecal coliform	2.86E+09		7.70E+08	1.57E+09	2.60E+08	2.60E+09	9%
			E. coli	[3]		4.85E+08	9.87E+08	1.64E+08	1.64E+09	Undetermined [2]
GAR031300021019	Flat Shoals Creek	Tributary at Stovall Road to Big Branch	Fecal coliform	2.43E+12	3.51E+08		1.47E+12	1.64E+11	1.64E+12	33%
			E. coli	[3]	2.21E+08		9.27E+11	1.03E+11	1.03E+12	Undetermined [2]
GAR031300021020	Flat Shoals Creek	Big Branch to Lake Harding	Fecal coliform	2.64E+12	3.51E+08		1.60E+12	1.78E+11	1.78E+12	33%
			E. coli	[3]	2.21E+08		1.01E+12	1.12E+11	1.12E+12	Undetermined [2]
GAR031300010812	Flowery Branch	Tributary to Lake Lanier	Fecal coliform	3.87E+10		9.22E+09	1.13E+10	2.28E+09	2.28E+10	41%
			E. coli	[3]		5.81E+09	7.11E+09	1.44E+09	1.44E+10	Undetermined [2]
GAR031300010809	Fourmile Creek	Lake Lanier Tributary	Fecal coliform	9.28E+10		6.20E+09	7.49E+10	9.01E+09	9.01E+10	3%
			E. coli	[3]		3.90E+09	4.72E+10	5.68E+09	5.68E+10	Undetermined [2]
GAR031300030701	Hannahatchee Creek	U.S. Hwy 27 to Lake W. F. George	Fecal coliform	4.76E+11			7.80E+11	8.66E+10	8.66E+11	0%
			E. coli	[3]			4.91E+11	5.46E+10	5.46E+11	Undetermined [2]
GAR031300020334	House Creek	Headwaters to Anneewakee Creek	Fecal coliform	1.81E+10		9.17E+09	7.05E+09	1.80E+09	1.80E+10	0%
			E. coli	[3]		5.77E+09	4.44E+09	1.14E+09	1.14E+10	Undetermined [2]
GAR031300010902	James Creek	Daves Creek to the Chattahoochee River	Fecal coliform	8.49E+10	3.43E+08	5.22E+10	8.64E+10	1.54E+10	1.54E+11	0%
			E. coli	[3]	1.88E+09	3.23E+10	5.34E+10	9.73E+09	9.73E+10	Undetermined [2]
GAR031300020908	Lee Branch	Tributary to Troup Branch - LaGrange	Fecal coliform	1.02E+10			5.32E+09	5.91E+08	5.91E+09	42%
			E. coli	[3]			3.35E+09	3.73E+08	3.73E+09	Undetermined [2]
GAR031300010301	Limestone Creek	Headwaters to Brenau Lake	Fecal coliform	4.48E+09		1.44E+09	1.92E+09	3.73E+08	3.73E+09	17%
			E. coli	[3]		9.04E+08	1.21E+09	2.35E+08	2.35E+09	Undetermined [2]
GAR031300020305	Little Bear Creek	Annewakee Lake to Bear Creek	Fecal coliform	9.70E+10		1.42E+10	7.09E+10	9.46E+09	9.46E+10	2%
			E. coli	[3]		8.98E+09	4.47E+10	5.96E+09	5.96E+10	Undetermined [2]
GAR031300010816	Longwood Park Creek	Tributary to Lake Lanier (Gainesville)	Fecal coliform	2.29E+09		1.03E+09	1.02E+09	2.29E+08	2.29E+09	0%
			E. coli	[3]		6.51E+08	6.45E+08	1.44E+08	1.44E+09	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300010303	Mossy Creek	Totherow Rd. near Clermont to Chattahoochee River	Fecal coliform	2.55E+11			4.18E+11	4.64E+10	4.64E+11	0%
			E. coli	[3]			2.63E+11	2.92E+10	2.92E+11	Undetermined [2]
GAR031300020508	New River	Mountain Creek to West Point Lake - Corinth	Fecal coliform	1.13E+12	5.86E+08	2.62E+10	9.41E+11	1.08E+11	1.08E+12	5%
			E. coli	[3]	2.98E+09	1.64E+10	5.90E+11	6.77E+10	6.77E+11	Undetermined [2]
GAR031300020408	Panther Creek	Headwaters to Cedar Creek	Fecal coliform	3.02E+10		3.04E+07	3.62E+10	4.03E+09	4.03E+10	0%
			E. coli	[3]		1.92E+07	2.28E+10	2.54E+09	2.54E+10	Undetermined [2]
GAR031300020907	Park Branch	Tributary to Troup Branch - LaGrange	Fecal coliform	6.33E+09			6.33E+09	7.03E+08	7.03E+09	0%
			E. coli	[3]			3.99E+09	4.43E+08	4.43E+09	Undetermined [2]
GAR031300020702	Pepperell Creek	Headwaters to tributary 0.55 miles upstream of Shoal Creek, LaGrange	Fecal coliform	1.26E+10			1.51E+10	1.68E+09	1.68E+10	0%
			E. coli	[3]			9.53E+09	1.06E+09	1.06E+10	Undetermined [2]
GAR031300010814	Rock Creek	Headwaters to Lake Lanier (Gainesville)	Fecal coliform	1.52E+09		7.39E+08	7.40E+08	1.64E+08	1.64E+09	0%
			E. coli	[3]		4.66E+08	4.66E+08	1.04E+08	1.04E+09	Undetermined [2]
GAR031300010804	Sawnee Creek	Lake Lanier Tributary	Fecal coliform	5.59E+10		9.54E+09	3.42E+10	4.86E+09	4.86E+10	13%
			E. coli	[3]		6.01E+09	2.15E+10	3.06E+09	3.06E+10	Undetermined [2]
GAR031300010805	Six Mile Creek	Headwaters to Lake Lanier	Fecal coliform	6.04E+10		2.59E+08	3.44E+10	3.85E+09	3.85E+10	36%
			E. coli	[3]		1.63E+08	2.16E+10	2.42E+09	2.42E+10	Undetermined [2]
GAR031300010815	Slaughterhouse Creek	Tributary to Lake Lanier (Gainesville)	Fecal coliform	3.45E+09		3.04E+09	2.60E+09	6.28E+08	6.28E+09	0%
			E. coli	[3]		1.92E+09	1.64E+09	3.95E+08	3.95E+09	Undetermined [2]
GAR031300020341	Snake Creek	Little Snake Creek to Crews Creek	Fecal coliform	2.92E+11			2.63E+11	2.92E+10	2.92E+11	0%
			E. coli	[3]			1.66E+11	1.84E+10	1.84E+11	Undetermined [2]
GAR031300020342	Snake Creek	Crews Creek to GA Hwy 5	Fecal coliform	4.05E+11			3.65E+11	4.05E+10	4.05E+11	0%
			E. coli	[3]			2.30E+11	2.55E+10	2.55E+11	Undetermined [2]
GAR031300020343	Snake Creek	GA Hwy 5 to the Chattahoochee River	Fecal coliform	4.54E+11			4.09E+11	4.54E+10	4.54E+11	0%
			E. coli	[3]			2.58E+11	2.86E+10	2.86E+11	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)[1]	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300010806	South Fork Balus Creek	Headwaters to Balus Creek (Gainesville)	Fecal coliform	6.62E+10	3.40E+06	1.10E+10	1.67E+10	3.08E+09	3.08E+10	53%
			E. coli	[3]	2.14E+06	6.93E+09	1.05E+10	1.94E+09	1.94E+10	Undetermined [2]
GAR031300010304	South Fork Limestone Creek/Limestone Creek	Headwaters to Limestone Creek Arm of Lake Lanier	Fecal coliform	5.00E+10		1.76E+10	1.84E+10	4.00E+09	4.00E+10	20%
			E. coli	[3]		1.11E+10	1.16E+10	2.52E+09	2.52E+10	Undetermined [2]
GAR031300010701	Taylor Creek	Headwaters to Lake Lanier	Fecal coliform	2.29E+10		8.41E+07	3.75E+10	4.17E+09	4.17E+10	0%
			E. coli	[3]		5.30E+07	2.36E+10	2.63E+09	2.63E+10	Undetermined [2]
GAR031300010702	Toto Creek	Headwaters to Lake Lanier	Fecal coliform	7.38E+09			4.96E+09	1.14E+09	1.14E+10	0%
			E. coli	[3]			3.13E+09	7.15E+08	7.15E+09	Undetermined [2]
GAR031300010318	Tributary to Limestone Creek	Breneau Lake to Limestone Creek	Fecal coliform	2.06E+10		5.26E+09	1.55E+10	1.72E+09	1.72E+10	17%
			E. coli	[3]		3.31E+09	9.74E+09	1.08E+09	1.08E+10	Undetermined [2]
GAR031300010407	Tributary to West Fork Little River	Headwaters to West Fork Little River in Clermont	Fecal coliform	1.31E+10			9.40E+09	1.04E+09	1.04E+10	20%
			E. coli	[3]			5.92E+09	6.58E+08	6.58E+09	Undetermined [2]
GAR031300020904	Troup Branch	Tributary to Blue John Creek - LaGrange	Fecal coliform	2.58E+10			1.86E+10	2.07E+09	2.07E+10	20%
			E. coli	[3]			1.17E+10	1.30E+09	1.30E+10	Undetermined [2]
GAR031300010807	Two Mile Creek	Headwaters to Lake Lanier	Fecal coliform	7.55E+10		1.73E+09	4.36E+10	5.03E+09	5.03E+10	33%
			E. coli	[3]		1.09E+09	2.75E+10	3.17E+09	3.17E+10	Undetermined [2]
GAR031300010403	Wahoo Creek	SR 52 to Lake Lanier	Fecal coliform	9.23E+11			3.04E+11	3.48E+10	3.48E+11	62%
			E. coli	[3]			1.92E+11	2.19E+10	2.19E+11	Undetermined [2]
GAR031300020412	Wahoo Creek	Downstream Arnco Mills Lake	Fecal coliform	7.53E+11	3.70E+09	9.13E+09	2.66E+11	3.01E+10	3.01E+11	60%
			E. coli	[3]	2.33E+09	5.75E+09	1.67E+11	1.90E+10	1.90E+11	Undetermined [2]
GAR031300010404	West Fork Little River	Headwaters to Jim Hood Road above Lake Lanier	Fecal coliform	3.47E+11		1.72E+09	2.48E+11	2.78E+10	2.78E+11	20%
			E. coli	[3]		1.09E+09	1.56E+11	1.75E+10	1.75E+11	Undetermined [2]
GAR031300020430	Whooping Creek	Headwaters to Carthbody Creek	Fecal coliform	1.72E+11	3.86E+07		1.07E+11	1.19E+10	1.19E+11	31%
			E. coli	[3]	2.43E+07		6.74E+10	7.49E+09	7.49E+10	Undetermined [2]

Assessment Unit ID	Stream Segment	Description	Bacterial Indicator	Current Load (counts/ 30 days)	TMDL Components					Reduction Required
					WLA (counts/ 30 days)(1)	WLAsw (counts/ 30 days)	LA (counts/ 30 days)	MOS (counts/ 30 days)	TMDL (counts/ 30 days)	
GAR031300020431	Whooping Creek	Carthbody Creek to the Chattahoochee River	Fecal coliform	4.19E+11	3.86E+07		2.60E+11	2.89E+10	2.89E+11	31%
			E. coli	(3)	2.43E+07		1.64E+11	1.82E+10	1.82E+11	Undetermined (2)
GAR031300020321	Wolf Creek	Headwaters to Chattahoochee River	Fecal coliform	1.00E+11			1.39E+11	1.54E+10	1.54E+11	0%
			E. coli	(3)			8.76E+10	9.73E+09	9.73E+10	Undetermined (2)
GAR031300020714	Yellowjacket Creek	Hogansville to West Point Lake	Fecal coliform	8.79E+11	1.82E+09		6.86E+11	7.65E+10	7.65E+11	13%
			E. coli	(3)	1.14E+09		4.32E+11	4.82E+10	4.82E+11	Undetermined (2)

(1) The assigned bacterial load from the NPDES permitted facility for WLA was determined as the product of the permitted flow and bacteria permit limit.
(2) Percent reduction could not be determined due to absence of current load calculation.
(3) Critical loading could not be determined due to no samples collected.
(4) The original EPA TMDL model was run for a critical time period using the "calibrated" fecal and flow parameters. The model run resulted in a summer fecal coliform 30-day geometric mean concentration. The existing load was calculated using this concentration times the annual flow.

6.0 RECOMMENDATIONS

The TMDL process consists of an evaluation of the sub-watersheds for each 303(d) listed stream segment to identify, as best as possible, the sources of the bacteria loads causing the stream to exceed instream criteria. The TMDL analysis was performed using the best available data to specify WLAs and LAs that will meet bacteria water quality criteria to support the use classification specified for the listed segment.

This TMDL represents part of a long-term process to reduce bacteria loading to meet water quality standards in the Chattahoochee River Basin. Implementation strategies will be reviewed and the TMDL will be refined, as necessary, in the next phase (next five-year cycle). The phased approach will support progress toward water quality standards attainment in the future. In accordance with USEPA TMDL guidance, the TMDL may be revised based on the results of future monitoring and source characterization data efforts. The following recommendations emphasize further source identification and involve the collection of data to support the current allocations and subsequent source reductions.

6.1 Monitoring

Water quality monitoring is conducted at several locations across the State each year. Sampling is conducted statewide by GA EPD personnel in Atlanta, Augusta, Brunswick, Cartersville, and Tifton. Additional monitoring sites are added as necessary.

In the case where a watershed-based plan has been developed for a listed stream segment, an appropriate water quality monitoring program will be outlined. The monitoring program will be developed to help identify the various bacteria sources. The monitoring program may be used to verify the 303(d) stream segment listings. This will be especially valuable for those segments where limited data resulted in the listing.

6.2 Bacteria Management Practices

Based on the findings of the source assessment, NPDES point source bacteria loads from wastewater treatment facilities usually do not significantly contribute to the impairment of the listed stream segments. This is because most facilities are required to treat to levels corresponding to instream water quality criteria. Sources of bacteria in urban areas include wastes that are attributable to domestic animals, leaks and overflows from sanitary sewer systems, illicit discharges of sanitary waste, leaking septic systems, runoff from improper disposal of waste materials, and leachate from both operational and closed landfills. In agricultural areas, potential sources of bacteria may include CAFOs, animals grazing in pastures, dry manure storage facilities and lagoons, chicken litter storage areas, and direct access of livestock to streams. Wildlife, especially waterfowl and mammals living close to or in water environments, can be a significant source of bacteria.

Management practices are recommended to reduce bacteria source loads to the listed 303(d) stream segments, with the result of achieving the instream bacteria criteria. These recommended management practices include:

- Compliance with NPDES (wastewater, construction, industrial stormwater, and/or MS4) permit limits and requirements;

- Ensure storm water management plans are in place and being implemented by the local governments located in the watershed;
- Implementation of Georgia's *Statewide Nonpoint Source Management Plan* (GA EPD, 2019)
- Implementation of recommended Water Quality management practices in the *Metro District Water Resource Management Plan* (MNGWPD, 2022);
- Implementation of recommended Water Quality management practices in the *Coosa-North Georgia, Middle Chattahoochee, Upper Flint, and Lower Flint-Ochlockonee Regional Water Plans* (GA EPD, 2023);
- Implementation of *Georgia's Best Management Practices for Forestry* (GFC, 2019);
- Implementation of *Best Management Practices for Georgia Agriculture* (GSWCC, 2013) and Adoption of National Resource Conservation Service (NRCS) Conservation Practices for agriculture;
- Adoption and implementation of the *Georgia Stormwater Management Manual* (ARC, 2016) and the *Coastal Stormwater Supplement to the Georgia Stormwater Management Manual* (CWP, 2009) to facilitate water quality treatment of stormwater runoff, including bacteria removal, through structural stormwater BMP installation.

6.2.1 Point Source Approaches

The NPDES permit program provides a basis for municipal, industrial, and stormwater permits, monitoring and compliance with permit limitations, and appropriate enforcement actions for violations. In accordance with GA EPD rules and regulations, all discharges from point source facilities are required to follow the conditions of their NPDES permit at all times. Wastewater treatment plants with the potential for bacteria in their discharge are given end-of-pipe limits to meet the applicable water quality standard. In addition, the permits include routine monitoring and reporting requirements.

Achieving the TMDL reductions may constitute compliance with a SWMP or SWPPP, provided the MEP definition is met, even where the numeric percent reduction may not be achieved so long as reasonable progress is made toward attainment of water quality standards using an iterative BMP process.

6.2.2 Nonpoint Source Approaches

GA EPD is the lead agency for implementing the State's Nonpoint Source Management Program, as described in Georgia's *Statewide Nonpoint Source Management Plan* (GA EPD, 2019). GA EPD will continue to work with local governments, agricultural, and forestry agencies such as the Natural Resources Conservation Service (NRCS), the Georgia Soil and Water Conservation Commission (GSWCC), and the Georgia Forestry Commission (GFC) to foster the implementation of BMPs that address nonpoint source pollution. The following sections describe programs in place and recommendations which should result in reducing nonpoint source loads of bacteria in Georgia's surface waters.

6.2.2.1 Agricultural Sources

GA EPD should coordinate with other agencies that are responsible for agricultural activities in the state to address issues concerning bacteria loading from agricultural lands. It is recommended

that information such as livestock populations by sub-watershed, animal access to streams, manure storage and application practices be periodically reviewed so that watershed evaluations can be updated to reflect current conditions. It is also recommended that BMPs be utilized to reduce the number of bacteria transported to surface waters from agricultural sources to the maximum extent practicable.

The following three organizations have primary responsibility for working with farmers to promote soil and water conservation, and to protect water quality:

- University of Georgia (UGA - Cooperative Extension Service);
- Georgia Soil and Water Conservation Commission (GSWCC); and
- Natural Resources Conservation Service (NRCS).

UGA has faculty, County Cooperative Extension Agents, and technical specialists who provide services in several key areas relating to agricultural impacts on water quality. GA EPD designated the GSWCC as the lead agency for agricultural Nonpoint Source Management in the State. The GSWCC develops nonpoint source management programs and conducts educational activities to promote conservation and protection of land and water devoted to agricultural uses.

The NRCS works with federal, state, and local governments to provide financial and technical assistance to farmers. The NRCS develops standards and specifications for BMPs that are to be used to improve, protect, and/or maintain our state's natural resources. In addition, every five years, the NRCS conducts the National Resources Inventory (NRI). The NRI is a statistically-based sample of land use and natural resource conditions and trends that covers non-federal land in the United States.

The NRCS is also providing technical assistance to the GSWCC and the GA EPD with the Georgia River Basin Planning Program. Planning activities associated with this program will describe conditions of the agricultural natural resource base once every five years. It is recommended that the GSWCC and the NRCS continue to encourage BMP implementation, education efforts, and river basin surveys with regard to river basin planning.

6.2.2.2 Urban Sources

Both point and nonpoint sources of bacteria can be significant in the Chattahoochee River Basin urban areas. Urban sources of bacteria can best be addressed using a strategy that involves stormwater management, public participation, and intergovernmental coordination to reduce the discharge of pollutants to the maximum extent practicable. Management practices, control techniques, public education, and other appropriate methods and provisions may be employed. The following activities and programs conducted by cities, counties, and state agencies are recommended:

- Implement stormwater BMPs that incorporate water quality treatment and/or pollutant removal

- Uphold requirements that all new and replacement sanitary sewerage systems be designed to minimize discharges into storm sewer systems;

- Further develop and streamline mechanisms for reporting and correcting illicit connections, breaks, surcharges, and general sanitary sewer system problems;

- Continue efforts to increase public awareness and education towards the impact of human activities in urban settings on water quality, ranging from the consequences of industrial and municipal discharges to the activities of individuals in residential neighborhoods.

6.3 Reasonable Assurance

GA EPD is responsible for administering and enforcing laws to protect the waters of the State. Reasonable assurance ensures that a TMDL's wasteload and load allocations are properly distributed to meet the applicable water quality standards. Without such distribution, a TMDL's ability to serve as an effective guidepost for water quality improvement is significantly diminished. Federal regulations implementing the CWA require that effluent limits in permits be consistent with "the assumptions and requirements of any available [WLA]" in an approved TMDL [40 CFR 122.44(d)(1)(vii)(B)]. NPDES point source permits will be given effluent limits in the permit consistent with the individual WLAs specified in the TMDL.

The GA EPD is the lead agency for implementing the State's Nonpoint Source Management Program. Regulatory responsibilities that have a bearing on nonpoint source pollution include establishing water quality criteria and use classifications, assessing and reporting water quality conditions, and regulating land use activities that may affect water quality. Georgia is working with local governments, agricultural and forestry agencies, such as the NRCS the GSWCC, and the GFC, to foster the implementation of BMPs to address nonpoint sources. In addition, public education efforts will be targeted to individual stakeholders to provide information regarding the use of BMPs to protect water quality.

6.4 Public Participation

A forty-five-day public notice was provided for this TMDL. During that time, the draft TMDL was available on the GA EPD website, a copy of the draft TMDL was to be provided on request, and the public was invited to provide comments on the TMDL.

7.0 INITIAL TMDL IMPLEMENTATION PLAN

This plan identifies applicable State-wide programs and activities that may be employed to manage point and nonpoint sources of bacteria loads for the segment in the Chattahoochee River Basin. Local watershed planning and management initiatives will be fostered, supported, or developed through a variety of mechanisms. Implementation may be addressed by Watershed-Based Plans or other assessments funded by Section 319(h) grants, the local development of watershed protection plans, or "Targeted Outreach" initiated by GA EPD. These initiatives will supplement or possibly replace this initial implementation plan. Implementation actions should also be guided by the recommended management practices and actions contained within each applicable Regional Water Plan developed as part of *Georgia's Comprehensive State-wide Water Management Plan* implementation (Georgia Water Council, 2008).

7.1 Impaired Segments

This initial plan is applicable to the following waterbody that was added to Georgia's 2022 Integrated 305(b)/303(d) List of not supporting waters in *Water Quality in Georgia 2020-2021* (GA EPD, 2022) available on the GA EPD website. The following tables summarize the descriptive information provided in the 303(d) list.

Table 17: Stream Segments Listed on the 2022 303(d) List for Bacteria in the Chattahoochee River Basin

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use
Anneewakee Creek	Lake Monroe to Chattahoochee River	GAR031300020304	5	Fishing
Brush Creek	Tributary to West Point Lake	GAR031300020605	10	Fishing
Chattahoochee River	Dicks Creek to Johns Creek	GAR031300010913	12	Drinking Water, Recreation, Fishing
Coheelee Creek	Chancy Mill Creek to Chattahoochee River	GAR031300040502	5	Fishing
Cooper Creek	Headwaters to Bull Creek - Columbus	GAR031300030107	8.3	Fishing
Crawford Creek	Headwaters to Sulphur Creek	GAR031300021010	7.1	Fishing
Deer Creek	Headwaters to Centralhatchee Creek	GAR031300020422	9.6	Fishing
Denny Creek	Headwaters to Centralhatchee Creek	GAR031300020433	4	Fishing
Dozier Creek	Headwaters to Randall Creek	GAR031300030311	7	Fishing
East Trammel Branch	Headwaters to Yellowjacket Creek	GAR031300020716	3	Fishing

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use
Flatrock Creek	Tributary to Bull Creek - Columbus	GAR031300030110	3	Fishing
Fort Creek	Headwaters to Dowdell Creek	GAR031300021216	3	Fishing
Glade Branch	Headwaters to Town Creek	GAR031300010514	2	Fishing
Hannahatchee Creek	Ben Owens Creek to Bussey Branch	GAR031300030704	7	Fishing
Hillabahatchee Creek	Alabama State line to Red Oak Creek	GAR031300020613	4.8	Fishing
Hillabahatchee Creek	Red Oak Creek to Tollieson Branch, Franklin	GAR031300020614	13.3	Fishing
House Creek	Headwaters to Sand Creek	GAR031300021015	11	Fishing
Lick Log Creek	Lake Romona to Mill Creek	GAR031300020218	2	Fishing
Milligan Creek	Headwaters to Pond 0.9 miles upstream of the Heard County Line	GAR031300020428	5	Fishing
North Prong Kolomoki Creek	Tributary 1 mile downstream of Bluffton Highway to Kolomoki Creek	GAR031300040205	5	Fishing
Pataula Creek	Beaver Creek to Brier Creek	GAR031300031507	2.8	Fishing
Sand Creek	Headwaters to House Creek	GAR031300021018	9	Fishing
Standing Boy Creek	Striblin Creek to Mobleys Lake	GAR031300021308	5	Fishing
Tar River	Headwaters to Montarella Lake	GAR031300030204	4	Fishing
Tate Creek	Headwaters to Chestatee River	GAR031300010512	4	Fishing
Town Branch	Lake Val-Do Mar to Mud Creek - Villa Rica	GAR031300020211	2.9	Fishing
Town Creek	Alabama State line to tributary 0.5 miles upstream of Arrington Rd	GAR031300020611	2.7	Fishing
Town Creek	Tributary 0.5 miles upstream of Arrington Rd to Little Creek	GAR031300020612	4	Fishing
Tributary to Bull Creek	Headwaters to Bull Creek	GAR031300030121	2	Fishing

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use
Tributary to Cemochechobee Creek	Headwaters to Cemochechobee Creek	GAR031300040107	3	Fishing
Tributary to Lick Log Creek	Headwaters to Lick Log Creek	GAR031300020224	1.8	Fishing
Tributary to Mountain Creek	Callaway Gardens WPCP to Mountain Creek	GAR031300021103	2	Fishing
Tributary to Mulberry Creek	Oak View Home WPCP to Mulberry Creek	GAR031300021219	3	Fishing
Tributary to Mulberry Creek	Headwaters to Oak View Home WPCP	GAR031300021220	0.1	Fishing
White Sulfur Creek	Headwaters to Sulphur Creek	GAR031300021006	9	Fishing
Whitewater Creek	Headwaters to tributary 0.5 miles upstream Heard/Troup County Line	GAR031300020804	7.5	Fishing
Whitewater Creek	Tributary 0.5 miles upstream Heard/Troup County Line to West Point Lake	GAR031300020805	3.8	Fishing

Table 18: Stream Segments with Revised TMDLs for Bacteria in the Chattahoochee River Basin

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use	Original TMDL Action ID Number, Agency, and Year
Acorn Creek	Headwaters to the Chattahoochee River	GAR031300020401	6.5	Fishing	1 US EPA 1998
Baldwin Creek	Headwaters to Little Bear Creek	GAR031300020308	3.8	Fishing	49 US EPA 1998
Bear Creek	Dorsett Shoals Rd. to Little Bear Creek	GAR031300020313	3.5	Fishing	73 US EPA 1998
Big Creek	Tributary to Lake Lanier	GAR031300010813	2	Fishing	107 US EPA 1998
Billy Creek (Previously Nancy Long Creek/Billy Creek)	Strickland Lake to the Dog River	GAR031300020310	4.2	Fishing	846 US EPA 1998

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use	Original TMDL Action ID Number, Agency, and Year
Cedar Creek	Browns Creek to the Chattahoochee River (Formerly Coweta County)	GAR031300020420	6	Fishing	230 US EPA 1998
Centralhatchee Creek	Headwaters to the Chattahoochee River	GAR031300020421	19	Fishing	237 US EPA 1998
Chattahoochee River	SR255 to Soquee River	GAR031300010105	11	Recreation, Fishing	247 US EPA 1998
Chestatee River	Yahoola Creek to Lake Lanier	GAR031300010704	9	Fishing	261 US EPA 1998
Dixie Creek	Headwaters to West Point Lake - LaGrange	GAR031300020709	3.4	Fishing	376 US EPA 1998
Drag Nasty Creek	Tributary to W. F. George	GAR031300031301	7	Fishing	381 US EPA 1998
Etta Vista Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010817	1	Fishing	423 US EPA 1998
Flat Shoals Creek	Tributary at Stovall Road to Big Branch	GAR031300021019	19	Fishing	439 US EPA 1998
Flat Shoals Creek	Big Branch to Lake Harding	GAR031300021020	9	Fishing	439 US EPA 1998
Flowery Branch	Tributary to Lake Lanier	GAR031300010812	1	Fishing	445 US EPA 1998
Fourmile Creek	Lake Lanier Tributary	GAR031300010809	3	Fishing	452 US EPA 1998
Hannahatchee Creek	U.S. Hwy 27 to Lake W. F. George	GAR031300030701	14	Fishing	517 US EPA 1998
House Creek	Headwaters to Anneewakee Creek	GAR031300020334	2.4	Fishing	546 US EPA 1998
James Creek	Daves Creek to the Chattahoochee River	GAR031300010902	2	Fishing	570 US EPA 1998
Lee Branch	Tributary to Troup Branch - LaGrange	GAR031300020908	1	Fishing	670 US EPA 1998
Limestone Creek	Headwaters to Brenau Lake	GAR031300010301	0.9	Fishing	684 US EPA 1998

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use	Original TMDL Action ID Number, Agency, and Year
Little Bear Creek	Annewakee Lake to Bear Creek	GAR031300020305	3.7	Fishing	692 US EPA 1998
Longwood Park Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010816	1	Fishing	725 US EPA 1998
Mossy Creek	Totherow Rd. near Clermont to Chattahoochee River	GAR031300010303	7	Fishing	823 US EPA 1998
New River	Mountain Creek to West Point Lake - Corinth	GAR031300020508	4.4	Fishing	859 US EPA 1998
Panther Creek	Headwaters to Cedar Creek	GAR031300020408	3.2	Fishing	903 US EPA 1998
Park Branch	Tributary to Troup Branch - LaGrange	GAR031300020907	2	Fishing	908 US EPA 1998
Pepperell Creek	Headwaters to tributary 0.55 miles upstream of Shoal Creek, LaGrange	GAR031300020702	2	Fishing	922 US EPA 1998
Rock Creek	Headwaters to Lake Lanier (Gainesville)	GAR031300010814	0.5	Fishing	1009 US EPA 1998
Sawnee Creek	Lake Lanier Tributary	GAR031300010804	2	Fishing	1057 US EPA 1998
Six Mile Creek	Headwaters to Lake Lanier	GAR031300010805	2	Fishing	1080 US EPA 1998
Slaughterhouse Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010815	0.7	Fishing	1086 US EPA 1998
Snake Creek	Little Snake Creek to Crews Creek	GAR031300020341	1.1	Fishing	1091 US EPA 1998
Snake Creek	Crews Creek to GA Hwy 5	GAR031300020342	7.2	Fishing, Drinking Water	1091 US EPA 1998
Snake Creek	GA Hwy 5 to the Chattahoochee River	GAR031300020343	5	Fishing, Drinking Water	1091 US EPA 1998
South Fork Balus Creek	Headwaters to Balus Creek (Gainesville)	GAR031300010806	2	Fishing	1100 US EPA 1998
South Fork Limestone Creek/Limestone Creek	Headwaters to Limestone Creek Arm of Lake Lanier	GAR031300010304	2	Fishing	1105 US EPA 1998

Stream Segment	Location	Assessment Unit ID	Segment Length (miles)	Designated Use	Original TMDL Action ID Number, Agency, and Year
Taylor Creek	Headwaters to Lake Lanier	GAR031300010701	3	Fishing	1185 US EPA 1998
Toto Creek	Headwaters to Lake Lanier	GAR031300010702	1.2	Fishing	1205 US EPA 1998
Tributary to Limestone Creek	Breneau Lake to Limestone Creek	GAR031300010318	1	Fishing	183 US EPA 1998
Tributary to West Fork Little River	Headwaters to West Fork Little River in Clermont	GAR031300010407	1.7	Fishing	1213 US EPA 1998
Troup Branch	Tributary to Blue John Creek - LaGrange	GAR031300020904	1	Fishing	1224 US EPA 1998
Two Mile Creek	Headwaters to Lake Lanier	GAR031300010807	5	Fishing	1242 US EPA 1998
Wahoo Creek	SR 52 to Lake Lanier	GAR031300010403	5	Fishing	1628 US EPA 1998
Wahoo Creek	Downstream Arnco Mills Lake	GAR031300020412	5	Fishing	1285 US EPA 1998
West Fork Little River	Headwaters to Jim Hood Road above Lake Lanier	GAR031300010404	12	Fishing	1722 US EPA 1998
Whooping Creek	Headwaters to Carthbody Creek	GAR031300020430	8	Fishing	1331 US EPA 1998
Whooping Creek	Carthbody Creek to the Chattahoochee River	GAR031300020431	5	Fishing	1331 US EPA 1998
Wolf Creek	Headwaters to Chattahoochee River	GAR031300020321	10	Fishing	1347 US EPA 1998
Yellowjacket Creek	Hogansville to West Point Lake	GAR031300020714	5	Fishing	1355 US EPA 1998

The water use classification for the listed stream segments in the Chattahoochee River Basin are "Drinking Water, "Recreation," and "Fishing." The criterion violated is listed as fecal coliform. The potential causes listed include urban runoff and nonpoint sources. The bacteria water quality criteria applicable at the time of listing was as follows:

(a) Drinking Water Supplies: Those waters approved as a source for public drinking water systems permitted or to be permitted by the Environmental Protection Division. Waters classified for drinking water supplies will also support the fishing use and any other use requiring water of a lower quality.

(i) Bacteria: For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform not to exceed a geometric mean of 200 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 mL (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing freshwater streams. For the months of November through April, fecal coliform not to exceed a geometric mean of 1,000 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 mL for any sample. The State does not encourage swimming in surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of fecal coliform.

(b) Recreation: General recreational activities such as water skiing, boating, and swimming, or for any other use requiring water of a lower quality, such as recreational fishing. These criteria are not to be interpreted as encouraging water contact sports in proximity to sewage or industrial waste discharges regardless of treatment requirements:

(i) Bacteria: Fecal coliform not to exceed the following geometric means based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours:

a. Coastal waters 100 per 100 mL
b. All other recreational waters 200 per 100 mL
c. Should water quality and sanitary studies show natural fecal coliform levels exceed 200/100 mL (geometric mean) occasionally in high quality recreational waters, then the allowable geometric mean fecal coliform level shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing fresh water streams.

(c) Fishing: Propagation of Fish, Shellfish, Game and Other Aquatic Life; primary contact recreation in and on the water for the months of May – October, secondary contact recreation in and on the water for the months of November – April; or for any other use requiring water of a lower quality.

(i) Bacteria: For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform not to exceed a geometric mean of 200 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 mL (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing freshwater streams. For the months of November through April, fecal coliform not to exceed a geometric mean of 1,000 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 mL for any sample. The State does not encourage swimming in surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of fecal coliform. For waters designated as shellfish growing areas by the Georgia DNR Coastal Resources Division, the requirements will be consistent with those established by the State and Federal agencies responsible for the National Shellfish Sanitation Program. The requirements are found in National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish, 2007 Revision (or most recent version), Interstate Shellfish Sanitation Conference, U.S. Food and Drug Administration.

In August 2015, the Georgia DNR Board adopted new bacteria criteria for “Recreation” uses using the bacterial indicators *E. coli* and enterococci. These bacteria are better indicators for human health illnesses. The adopted criteria have the same estimated illness rate (8 per 1000 swimmers) as the previously established fecal coliform criteria. EPA approved these revised criteria on August 16, 2016. In January 2022, the Georgia DNR Board adopted new bacteria criteria for “Fishing” and “Drinking Water” designated uses. EPA approved these proposed revisions to Georgia’s water quality standards on August 31, 2022. The bacteria water quality criteria for "Drinking Water”, “Recreation” and “Fishing” designated uses, as stated in the *State of Georgia’s Rules and Regulations for Water Quality Control*, Chapter 391-3-6-.03(6) (GA EPD, 2022), are as follows:

(c) Drinking Water Supplies: Those waters approved as a source for public drinking water systems permitted or to be permitted by the Environmental Protection Division. Waters classified for drinking water supplies will also support the fishing use and any other use requiring water of a lower quality.

(ii) Bacteria:

1. For the months of May through October, when primary water contact recreation activities are expected to occur, culturable E. coli not to exceed a geometric mean of 126 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 410 counts per 100 mL in the same 30-day interval.

2. For the months of November through April, culturable E. coli not to exceed a geometric mean of 265 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 861 counts per 100 mL in the same 30-day interval.

3. The State does not encourage swimming in these surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of bacteria.

(d) Recreation: Primary contact recreational activities that occur year round such as swimming, diving, whitewater boating (class III and above), water skiing, and surfing, or for any other use requiring water of a lower quality, such as recreational fishing. These criteria are not to be interpreted as encouraging water contact sports in proximity to sewage or industrial waste discharges regardless of treatment requirements:

(i) Bacteria:

1. Coastal and estuarine waters: Culturable enterococci not to exceed a geometric mean of 35 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an enterococci statistical threshold value (STV) of 130 counts per 100 mL in the same 30-day interval.

2. All other recreational waters: Culturable E. coli not to exceed a geometric mean of 126 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 410 counts per 100 mL in the same 30-day interval

(c) Fishing: Propagation of Fish, Shellfish, Game and Other Aquatic Life; primary contact recreation in and on the water for the months of May – October, secondary contact recreation in and on the water for the months of November – April; or for any other use requiring water of a lower quality.

(i) Bacteria:

1. Estuarine waters: For the months of May through October, when primary water contact recreation activities are expected to occur, culturable enterococci not to exceed a geometric

mean of 35 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an enterococci statistical threshold value (STV) of 130 counts per 100 mL the same 30-day interval.

For the months of November through April, culturable enterococci not to exceed a geometric mean of 74 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an enterococci statistical threshold value (STV) of 273 counts per 100 mL in the same 30-day interval.

2. All other fishing waters: For the months of May through October, when primary water contact recreation activities are expected to occur, culturable E. coli not to exceed a geometric mean of 126 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 410 counts per 100 mL in the same 30-day interval.

   For the months of November through April, culturable E. coli not to exceed a geometric mean of 265 counts per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. There shall be no greater than a ten percent excursion frequency of an E. coli statistical threshold value (STV) of 861 counts per 100 mL in the same 30-day interval.

3. The State does not encourage swimming in these surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of bacteria.

4. For waters designated as shellfish growing areas by the Georgia DNR Coastal Resources Division, the requirements will be consistent with those established by the State and Federal agencies responsible for the National Shellfish Sanitation Program. The requirements are found in National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish, 2007 Revision (or most recent version), Interstate Shellfish Sanitation Conference, U.S. Food and Drug Administration.

7.2 Potential Sources

An important part of the TMDL analysis is the identification of potential source categories. A source assessment characterizes the known and suspected bacteria sources in the watershed. Sources are broadly classified as either point or nonpoint sources. A point source is defined as a discernable, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters. Point sources of bacteria include NPDES permittees discharging treated wastewater and stormwater. Nonpoint sources of bacteria are diffuse sources that cannot be identified as entering the waterbody at a single location. These sources generally involve land use activities that contribute bacteria to streams during a rainfall runoff event.

NPDES point source bacteria loads from wastewater treatment facilities usually do not contribute to impairments. This is because these facilities are required to treat to levels corresponding to instream water quality criteria. However, point sources can and do fail, which may contribute to bacteria loads through leaks and overflows from sanitary sewer systems, CAFOs, or leachate from operational landfills.

Nonpoint sources of bacteria in urban areas include wastes that are attributable to domestic animals, illicit discharges of sanitary waste, leaking septic systems, runoff from improper disposal of waste materials, and leachate from closed landfills. In non-urban areas, potential sources of bacteria may include animals grazing in pastures, dry manure storage facilities and lagoons,

chicken litter storage areas, and direct access of livestock to streams. Wildlife, especially waterfowl and mammals living close to or in water environments, can be a significant source of bacteria.

7.3 Management Practices and Activities

GA EPD is responsible for administering and enforcing laws to protect the waters of the State and is the lead agency for implementing the State's Nonpoint Source Management Program. Georgia is working with local governments, agricultural and forestry agencies such as the Georgia Department of Agriculture, NRCS, GSWCC, and GFC to foster implementation of BMPs that address nonpoint source pollution. The following management practices are recommended to reduce bacteria loads to stream segments:

- Sustain compliance with NPDES treated wastewater permit requirements;
- Sustain compliance with NPDES MS4 permit requirements, where applicable;
- Compliance with future NPDES Industrial General Permit requirements, including where applicable, achieving benchmark levels for monitored constituents;
- Ensure storm water management plans are in place and being implemented by the local governments, and by the industrial facilities located in the watershed;
- Implementation of Georgia's *Statewide Nonpoint Source Management Plan* (GA EPD, 2019);
- Adoption and implementation of the *Georgia Stormwater Management Manual* (ARC, 2016) to facilitate water quality treatment of stormwater runoff, including bacteria removal, through structural stormwater BMP installation;
- Further develop and streamline mechanisms for reporting and correcting illicit discharges, breaks, surcharges, and general sanitary sewer system problems;
- Uphold requirements that all new and replacement sanitary sewage systems be designed to minimize discharges into storm sewer systems;
- Adoption of local ordinances (i.e., septic tanks, stormwater, etc.) that address local water quality;
- Continue efforts to increase public awareness and education regarding the impact of human activities on water quality, ranging from industrial and municipal discharges to individual's activities in residential neighborhoods;
- Continue working with Federal, State, and local agencies and owners of sites where cleanup measures are necessary, and in developing control measures to prevent future releases of constituents of concern;
- Implementation of recommended Water Quality management practices in the *Metro District Water Resource Management Plan* (MNGWPD, 2022);
- Implementation of recommended Water Quality management practices in the *Coosa-North Georgia, Middle Chattahoochee, Upper Flint, and Lower Flint-Ochlockonee Regional Water Plans* (GA EPD, 2023);
- Adoption of NRCS Conservation Practices for primarily agricultural lands;
- Application of BMPs appropriate to both urban and rural land uses, where applicable; and
- Ongoing public education efforts on the sources of bacteria and common-sense approaches to lessen the impact of this contaminant on surface waters.

7.4 Monitoring

GA EPD encourages local governments and municipalities to develop and continue water quality monitoring programs. These programs can help pinpoint various bacteria sources, as well as verify the 303(d) stream segment listings. This will be particularly valuable for those segments where listing was based on limited data. In addition, regularly scheduled sampling will determine if there has been some improvement in the water quality of the listed stream segments. GA EPD would like to particularly commend and encourage downgradient sampling on the LAS system and supports expanding monitoring to quarterly or monthly sampling schedules. GA EPD is available to assist in providing technical guidance regarding the preparation of monitoring plans and Sampling Quality Assurance Plans (SQAP).

7.5 Future Action

This Initial TMDL Implementation Plan includes a general approach to pollutant source identification, as well as management practices to address pollutants. In the future, GA EPD will continue to determine and assess the appropriate point and non-point source management measures needed to achieve the TMDLs and to protect and restore water quality in impaired waterbodies.

For point sources, any wasteload allocations for wastewater treatment plant facilities will be implemented in the form of water quality-based effluent limitations in NPDES permits. Any wasteload allocations for regulated stormwater will be implemented in the form of BMPs in the NPDES permits. Contributions of bacteria from regulated communities may also be managed using permit requirements such as watershed assessments, watershed protection plans, and long-term monitoring. These measures will be directed through current point source management programs.

GA EPD will work to support watershed restoration, improvement and protection projects that address nonpoint source pollution. This is a process whereby GA EPD and/or Regional Commissions or other agencies or local governments, under a contract with GA EPD, will develop a Watershed Management Plan intended to address water quality at the small watershed level (HUC 10 or smaller). These plans will be developed as resources and willing partners become available. The development of these plans may be funded via several grant sources, including, but not limited to: CWA Section 319(h), Section 604(b), and/or Section 106 grant funds. These plans are intended for implementation upon completion.

Any Watershed Management Plan that specifically addresses a waterbody contained within this TMDL will supersede this Initial TMDL Implementation Plan for that waterbody once GA EPD accepts and/or approves the plan. Watershed Management Plans intended to address this TMDL and other water quality concerns, prepared for GA EPD, and for which GA EPD and/or the GA EPD Contractor are responsible, will contain at a minimum the US EPA's 9 Elements of Watershed Planning:

1) An identification of the sources or groups of similar sources contributing to nonpoint source pollution to be controlled to implement load allocations or achieve water quality standards. Sources should be identified at the subcategory level with estimates of the extent to which they are present in the watershed (e.g., X numbers of cattle feedlots needing upgrading, Y acres of row crops needing improved bacteria control, or Z linear miles of eroded streambank needing remediation);

2) An estimate of the load reductions expected for the management measures;

3) A description of the NPS management measures that will need to be implemented to achieve the load reductions established in the TMDL or to achieve water quality standards;

4) An estimate of the sources of funding needed, and/or authorities that will be relied upon, to implement the plan;

5) An information/education component that will be used to enhance public understanding of and participation in implementing the plan;

6) A schedule for implementing the management measures that is reasonably expeditious;

7) A description of interim, measurable milestones (e.g., amount of load reductions), improvement in biological or habitat parameters) for determining whether management measures or other control actions are being implemented;

8) A set of criteria that can be used to determine whether substantial progress is being made towards attaining water quality standards and, if not, the criteria for determining whether the plan needs to be revised; and;

9) A monitoring component to evaluate the effectiveness of the implementation efforts, measured against the criteria established under item 8.

The public will be provided an opportunity to participate in the development of Watershed Management Plans that address impaired waters and to comment on them before they are finalized.

GA EPD will continue to offer technical and financial assistance (when and where available) to complete Watershed Management Plans that address the impaired waterbodies listed in this and other TMDL documents. Assistance may include but will not be limited to:

- Assessments of pollutant sources within watersheds;
- Determinations of appropriate management practices to address impairments;
- Identification of potential stakeholders and other partners;
- Developing a plan for outreach to the public and other groups;
- Assessing the resources needed to implement the plan upon completion; and
- Other needs determined by the lead organization responsible for plan development.

GA EPD will also make this same assistance available, if needed, to proactively address water quality concerns. This assistance may be in the way of financial, technical, or other aid and may be requested and provided outside of the TMDL process or schedule.

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Appendix A

Drainage Areas And Annual Average Flow Values For Segments With Revised TMDLs

Table A-1: Drainage Areas And Annual Average Flow Values For Segments With Revised TMDLs

Revised 303(d) Listed Stream Segment	Segment Location	Assessment Unit ID	Mean Annual Stream Flow (ft^3/s)	Watershed Area (sq miles)
Acorn Creek	Headwaters to the Chattahoochee River	GAR031300020401	13.5	11.3
Baldwin Creek	Headwaters to Little Bear Creek	GAR031300020308	3.12	2.39
Bear Creek	Dorsett Shoals Rd. to Little Bear Creek	GAR031300020313	12.5	9.72
Big Creek	Tributary to Lake Lanier	GAR031300010813	5.26	3.83
Billy Creek (Previously Nancy Long Crk/Billy Crk)	Strickland Lake to the Dog River	GAR031300020310	4.98	3.93
Cedar Creek	Browns Creek to the Chattahoochee River (Formerly Coweta County)	GAR031300020420	59.1	52
Centralhatchee Creek	Headwaters to the Chattahoochee River	GAR031300020421	73.8	59.1
Chattahoochee River	SR255 to Soquee River	GAR031300010105	419	155
Chestatee River	Yahoola Creek to Lake Lanier	GAR031300010704	557	235
Dixie Creek	Headwaters to West Point Lake - LaGrange	GAR031300020709	4.24	3.45
Drag Nasty Creek	Tributary to W. F. George	GAR031300031301	13.38	12.5
Etta Vista Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010817	0.343	0.24
Flat Shoals Creek	Tributary at Stovall Road to Big Branch	GAR031300021019	216	204
Flat Shoals Creek	Big Branch to Lake Harding	GAR031300021020	235	221
Flowery Branch	Tributary to Lake Lanier	GAR031300010812	3.01	2.16
Fourmile Creek	Lake Lanier Tributary	GAR031300010809	11.9	7.95
Hannahatchee Creek	U.S. Hwy 27 to Lake W. F. George	GAR031300030701	114.4	143.6
House Creek	Headwaters to Anneewakee Creek	GAR031300020334	2.38	1.8
James Creek	Daves Creek to the Chattahoochee River	GAR031300010902	20.4	15.1
Lee Branch	Tributary to Troup Branch - LaGrange	GAR031300020908	0.781	0.63
Limestone Creek	Headwaters to Brenau Lake	GAR031300010301	0.493	0.34
Little Bear Creek	Annewakee Lake to Bear Creek	GAR031300020305	12.5	9.72
Longwood Park Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010816	0.302	0.21
Mossy Creek	Totherow Rd. near Clermont to Chattahoochee River	GAR031300010303	61.3	29.9
New River	Mountain Creek to West Point Lake - Corinth	GAR031300020508	142	125

Revised 303(d) Listed Stream Segment	Segment Location	Assessment Unit ID	Mean Annual Stream Flow (ft^3/s)	Watershed Area (sq miles)
Panther Creek	Headwaters to Cedar Creek	GAR031300020408	5.32	4.6
Park Branch	Tributary to Troup Branch - LaGrange	GAR031300020907	0.929	0.75
Pepperell Creek	Headwaters to tributary 0.55 miles upstream of Shoal Creek, LaGrange	GAR031300020702	2.22	1.81
Rock Creek	Headwaters to Lake Lanier (Gainesville)	GAR031300010814	0.217	0.15
Sawnee Creek	Lake Lanier Tributary	GAR031300010804	6.42	4.55
Six Mile Creek	Headwaters to Lake Lanier	GAR031300010805	5.08	3.41
Slaughterhouse Creek	Tributary to Lake Lanier (Gainesville)	GAR031300010815	0.829	0.58
Snake Creek	Little Snake Creek to Crews Creek	GAR031300020341	38.6	31.3
Snake Creek	Crews Creek to GA Hwy 5	GAR031300020342	53.5	43.7
Snake Creek	GA Hwy 5 to the Chattahoochee River	GAR031300020343	60	49.3
South Fork Balus Creek	Headwaters to Balus Creek (Gainesville)	GAR031300010806	4.07	2.88
South Fork Limestone Creek/Limestone Creek	Headwaters to Limestone Creek Arm of Lake Lanier	GAR031300010304	5.28	3.7
Taylor Creek	Headwaters to Lake Lanier	GAR031300010701	5.51	3.48
Toto Creek	Headwaters to Lake Lanier	GAR031300010702	1.5	0.9
Tributary to Limestone Creek	Breneau Lake to Limestone Creek	GAR031300010318	2.27	1.58
Tributary to West Fork Little River	Headwaters to West Fork Little River in Clermont	GAR031300010407	1.38	0.67
Troup Branch	Tributary to Blue John Creek - LaGrange	GAR031300020904	2.73	2.23
Two Mile Creek	Headwaters to Lake Lanier	GAR031300010807	6.65	4.45
Wahoo Creek	SR 52 to Lake Lanier	GAR031300010403	46	25
Wahoo Creek	Downstream Arnco Mills Lake	GAR031300020412	39.8	34.9
West Fork Little River	Headwaters to Jim Hood Road above Lake Lanier	GAR031300010404	36.7	20.6
Whooping Creek	Headwaters to Carthbody Creek	GAR031300020430	15.7	12.7
Whooping Creek	Carthbody Creek to the Chattahoochee River	GAR031300020431	38.2	31.4
Wolf Creek	Headwaters to Chattahoochee River	GAR031300020321	20.4	16.8
Yellowjacket Creek	Hogansville to West Point Lake	GAR031300020714	101	90.9

Appendix B

30-day Geometric Mean Fecal Coliform and Winter Single Sample Max Monitoring Data

Table A1. Anneewakee Creek at State Road 166 near Douglasville, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
1/19/2017	170	12.06	175.0	22.51	1.49E+11		
1/26/2017	80	34.74					
2/2/2017	230	19.29					
2/8/2017	300	23.94					
6/19/2017	20	18.39	49.8	27.95	5.27E+10		
6/26/2017	110	28.24					
7/11/2017	20.00	28.55					
7/17/2017	140	36.64					
10/12/2017	220	19.38	250.3	50.54	4.79E+11	3.83E+11	20.1%
10/23/2017	500	129.66					
10/26/2017	210	28.06					
10/30/2017	170	25.07					
12/7/2017	20	20.65	36.4	24.46	3.37E+10		
12/13/2017	110	25.98					
12/18/2017	40	23.45					
12/28/2017	20	27.78					

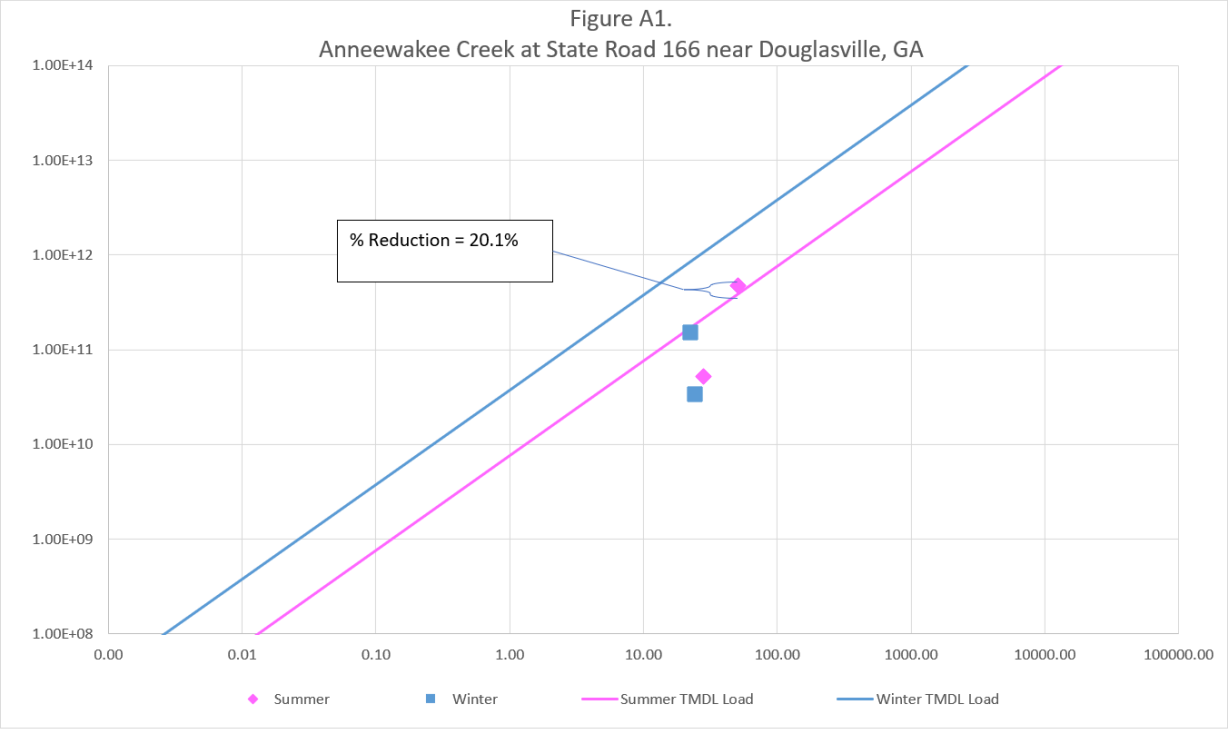

Table A2. Brush Creek at Bevis Rd near Franklin, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
3/20/2018	170	102.70	68.8	50.84	1.32E+11		
3/27/2018	20	33.20					
4/2/2018	110	34.03					
4/5/2018	60	33.44					
8/2/2018	2200	26.89	459.4	19.66	3.42E+11	1.49E+11	56.5%
8/13/2018	110	14.87					
8/22/2018	230	14.04					
8/30/2018	800	22.85					
10/1/2018	300	12.02	407.6	12.17	1.88E+11		
10/18/2018	800	12.26					
10/22/2018	500	12.02					
10/29/2018	230	12.38					
12/3/2018	230	37.84	69.9	32.61	8.63E+10		
12/6/2018	40	26.66					
12/17/2018	20	32.37					
12/20/2018	130	33.56					

Figure A2.
Brush Creek at Bevis Rd near Franklin, GA

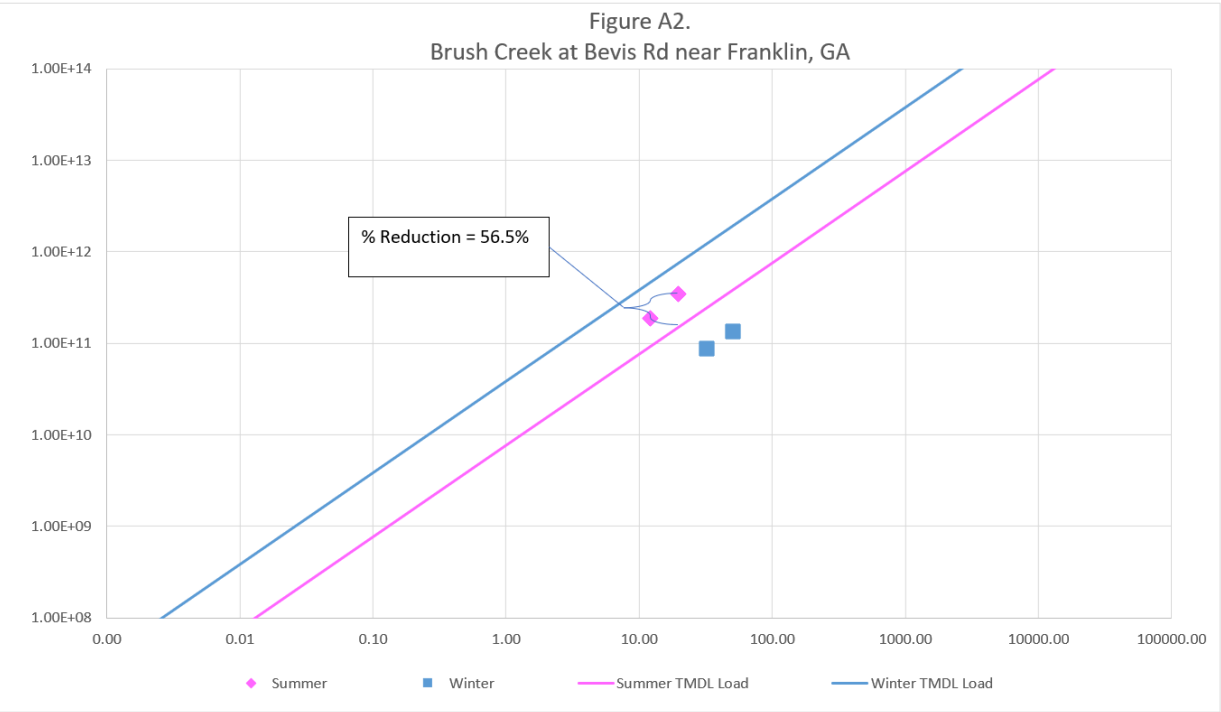

Table A3. Chattahoochee River at McGinnis Ferry Road

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Winter Single Sample Max Current Fecal Coliform Loading (counts/day)	Winter Single Sample Max TMDL Fecal Coliform Loading (counts/day)	% Reduction
2/17/2016	20	3011.07	56.1	4661.07	2.28E+12		
2/24/2016	1234	5444.26			2.54E+14		
3/3/2016	20	6113.38			4.63E+12		
3/7/2016	20	4075.59			3.09E+12		
7/7/2016	500	1328.11	350.0	1132.45			
7/14/2016	40	1135.49					
7/26/2016	1500	1074.66					
8/1/2016	500	991.52					
9/19/2016	1400	1561.29	105.4	1302.77			
9/28/2016	110	1419.36					
10/4/2016	40	1226.73					
10/11/2016	20	1003.69					
11/3/2016	20	1307.84	23.8	1553.69	9.90E+11		
11/7/2016	20	1530.88			1.16E+12		
11/14/2016	40	1662.68			2.52E+12		
11/21/2016	20	1713.37			1.30E+12		
12/8/2016	40	993.55	34.8	962.12	1.50E+12		
1/17/2017	40	1186.18			1.80E+12		
1/25/2017	80	985.44			2.98E+12		
2/1/2017	20	828.30			6.27E+11		
2/6/2017	20	817.15			6.19E+11		
6/21/2017	300	1307.84	207.8	1079.47			
6/29/2017	90	1044.24					
7/13/2017	230	911.43					
7/19/2017	300	1054.38					
10/3/2017	20	1409.22	95.5	1155.26			
10/10/2017	40	829.31					
10/17/2017	130	1023.97					
10/24/2017	800	1358.53					
12/7/2017	20	1267.28	29.1	1046.27	9.59E+11		
12/11/2017	90	1074.66			3.66E+12		
12/19/2017	20	1013.83			7.68E+11		
12/27/2017	20	829.31			6.28E+11		
1/25/2018	40	1023.97	38.0	1105.07	1.55E+12		
1/31/2018	20	830.33			6.29E+11		
2/8/2018	130	1571.43			7.73E+12		
2/13/2018	20	994.57			7.53E+11		
5/24/2018	300	1277.42	74.7	4820.75			
6/5/2018	40	6944.72					
6/13/2018	20	7725.37					
6/20/2018	130	3335.49					
8/23/2018	80	2514.29	40.0	2042.86			
8/29/2018	40	2088.49					
9/4/2018	20	1814.75					
9/20/2018	40	1753.92					
11/5/2018	20	875.95	28.3	3212.31	6.63E+11		
11/8/2018	40	2058.07			3.12E+12		
11/19/2018	20	7502.33			5.68E+12		
11/27/2018	40	2412.91			3.65E+12		
2/19/2019	55	2392.63	78.2	5966.38	4.98E+12		
2/26/2019	20	9235.97			6.99E+12		
3/4/2019	1700	4136.42			2.66E+14		
3/14/2019	20	8100.48			6.13E+12		
5/7/2019	20	3477.43	34.1	2504.15			
5/13/2019	170	2970.52					
5/30/2019	20	1733.65					
6/3/2019	20	1835.03					
7/22/2019	85	2777.89	52.3	2167.06			
7/29/2019	40	2189.87					
8/1/2019	20	1956.69					
8/6/2019	110	1743.78					
11/25/2019	20	1226.73	30.3	1822.66	9.29E+11		
12/4/2019	20	1774.20			1.34E+12		
12/11/2019	40	2433.19			3.68E+12		
12/16/2019	40	881.02			1.33E+12		
12/18/2019	40	2798.16			4.24E+12		
1/13/2020	230	1601.85	102.5	1626.43	1.39E+13		
1/15/2020	300	1520.74			1.73E+13		
2/4/2020	20	960.09			7.27E+11		
2/10/2020	80	2423.05			7.34E+12		
5/12/2020	20	2220.28	27.4	2932.50			
5/18/2020	70	4623.06					
6/2/2020	20	2666.37					
6/4/2020	20	2220.28					
8/25/2020	40	2412.91	257.1	2222.82			
8/31/2020	13000	3578.81					
9/3/2020	140	1611.99					
9/9/2020	60	1287.56					
11/5/2020	20	6153.94	681.7	4250.47	4.66E+12		
11/12/2020	90000	5008.31			1.71E+16	7.58E+14	95.6%
11/30/2020	3000	2960.38			3.36E+14		
12/2/2020	40	2879.27			4.36E+12		
1/11/2021	40	2686.64	23.8	2851.39	4.07E+12		
1/13/2021	20	2747.47			2.08E+12		
2/8/2021	20	3335.49			2.53E+12		
2/10/2021	20	2635.95			2.00E+12		
4/5/2021	20	4876.51	20.0	4022.36	3.69E+12		
4/7/2021	20	5454.39			4.13E+12		
4/19/2021	20	2230.42			1.69E+12		
4/28/2021	20	3528.12			2.67E+12		
6/22/2021	5200	1541.02	300.7	1416.82			
6/28/2021	130	1470.05					
7/13/2021	110	1297.70					
7/15/2021	110	1358.53					

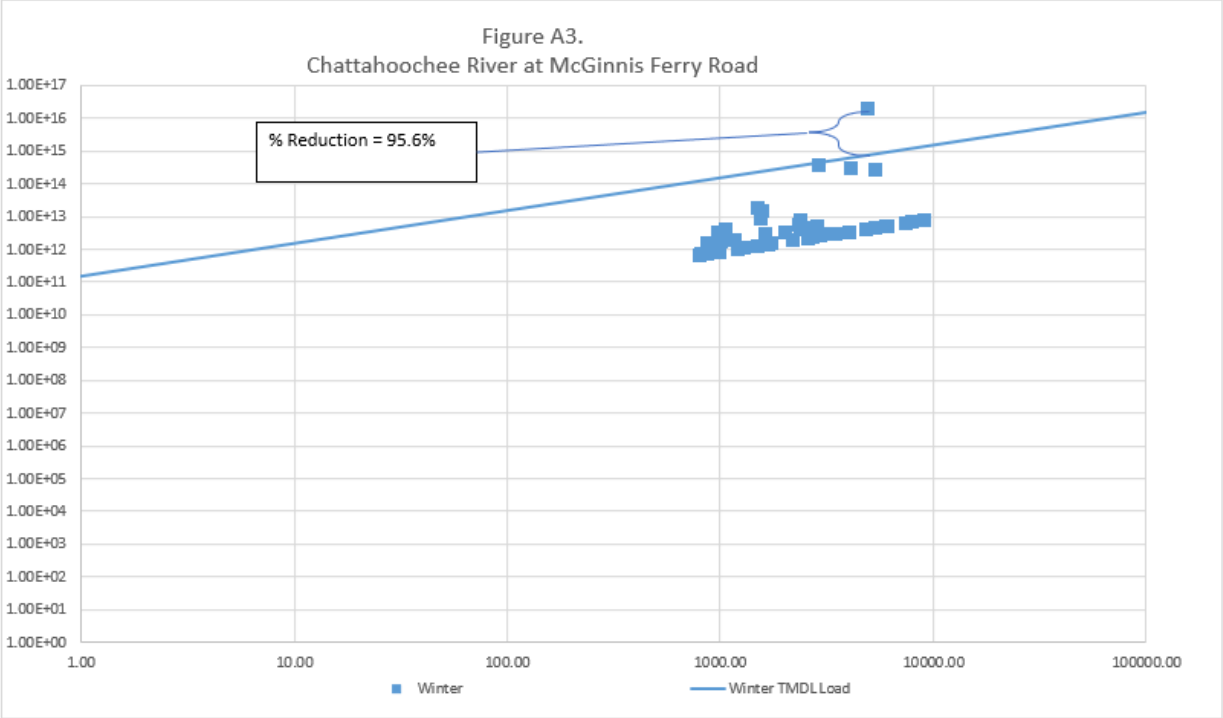
Figure A3.
Chattahoochee River at McGinnis Ferry Road
% Reduction = 95.6%
1.00E+17
1.00E+16
1.00E+15
1.00E+14
1.00E+13
1.00E+12
1.00E+11
1.00E+10
1.00E+09
1.00E+08
1.00E+07
1.00E+06
1.00E+05
1.00E+04
1.00E+03
1.00E+02
1.00E+01
1.00E+00
1.00
10.00
100.00
1000.00
10000.00
100000.00
Winter
Winter TMDL Load

Table A4. Coheelee Creek nr Old River Rd nr Blakely, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
1/5/2015	2800	38.62	492.4	29.62	5.52E+11		
1/7/2015	500	22.32					
1/21/2015	140	12.37					
1/26/2015	300	45.16					
4/6/2015	40	10.83	74.8	23.21	6.57E+10		
4/9/2015	230	9.92					
4/23/2015	85	42.22					
4/28/2015	40	29.88					
7/9/2015	17000	10.47	1533.1	7.93	4.60E+11	6.00E+10	87.0%
7/13/2015	500	7.82					
7/22/2015	500	7.82					
7/30/2015	1300	5.60					
10/5/2015	500	7.99	320.1	6.32	7.66E+10		
10/13/2015	400	6.09					
10/15/2015	700	5.76					
10/26/2015	300	5.33					
10/29/2015	80	6.45					

Figure A4.
Coheelee Creek nr Old River Rd nr Blakely, GA

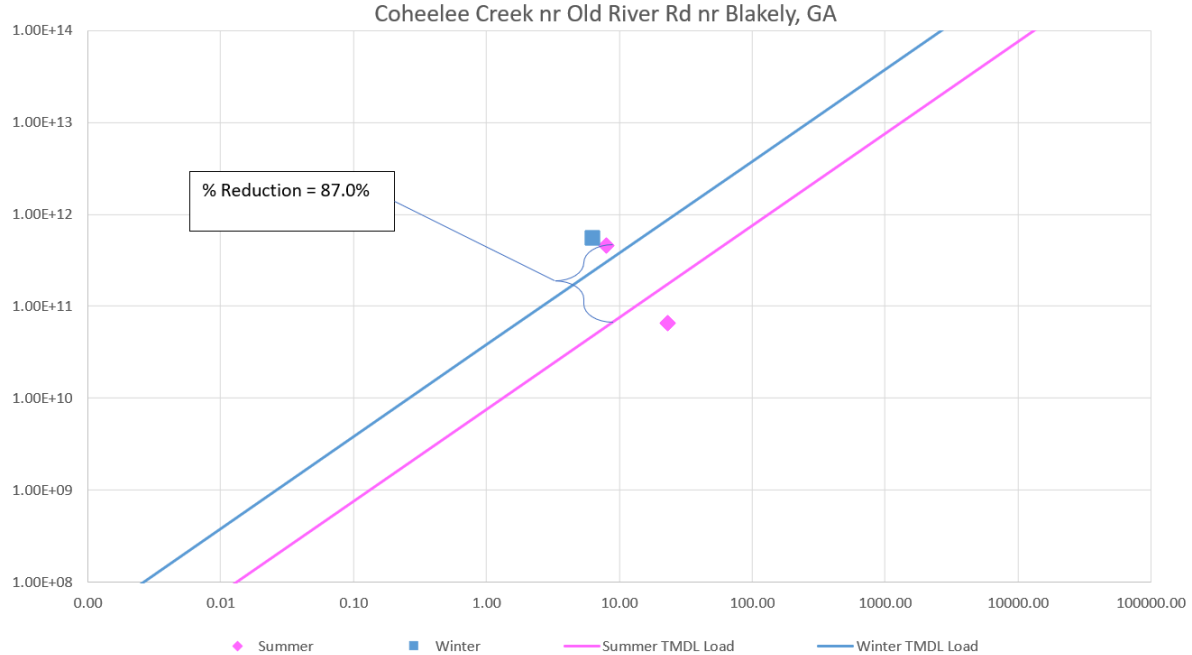

Table A5. Cooper Creek

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading	Geometric Mean TMDL Fecal Coliform Loading	% Reduction
5/16/2016	570	4.991	228.8	6.072	5.26E+10		
5/25/2016	360	7.689					
6/1/2016	99	6.065					
6/13/2016	135	5.542					
9/14/2016	784	5.658	315.3	4.302	5.13E+10		
9/15/2016	250	4.295					
9/20/2016	210	3.859					
9/21/2016	240	3.395					
12/8/2016	260	6.036	336.4	5.615	7.15E+10		
12/12/2016	171	3.250					
12/15/2016	600	7.051					
12/21/2016	480	6.123					
2/1/2017	90	12.913	209.5	10.831	8.59E+10		
2/6/2017	162	10.736					
2/14/2017	400	10.359					
2/21/2017	330	9.314					
6/12/2017	250	5.803	202.6	5.840	4.48E+10		
6/27/2017	180	6.297					
6/28/2017	320	5.049					
6/29/2017	117	6.210					
8/1/2017	171	4.788	232.9	4.933	4.35E+10		
8/2/2017	126	4.440					
8/14/2017	350	6.413					
8/21/2017	390	4.091					
10/3/2017	937	3.163	319.9	4.193	5.08E+10		
10/5/2017	99	3.105					
10/26/2017	1045	6.152					
11/1/2017	108	4.353					
1/31/2018	126	7.051	187.6	8.763	6.22E+10		
2/1/2018	117	6.239					
2/15/2018	240	12.593					
2/19/2018	350	9.169					
6/5/2018	874	18.571	1560.5	11.752	6.94E+11	8.90E+10	87.2%
6/6/2018	9454	14.770					
6/20/2018	937	7.428					
6/21/2018	766	6.239					
8/27/2018	480	3.366	483.9	3.199	5.86E+10		
8/28/2018	490	3.308					
9/10/2018	440	3.076					
9/11/2018	530	3.047					
11/19/2018	162	16.511	142.2	12.550	6.76E+10		
11/28/2018	117	10.968					
12/5/2018	90	11.868					
12/6/2018	240	10.852					
5/1/2019	153	7.312	229.2	6.913	6.00E+10		
5/2/2019	153	6.935					
5/21/2019	310	7.051					
5/22/2019	380	6.355					
7/29/2019	1455	3.859	602.7	3.685	8.41E+10		
7/30/2019	430	3.801					
8/19/2019	350	3.395					
11/4/2019	3810	5.339	422.2	6.754	1.08E+11		
11/5/2019	440	5.165					
11/19/2019	162	8.879					
11/20/2019	117	7.631					
1/7/2020	420	22.662	140.1	20.406	1.08E+11		
1/8/2020	90	19.296					
1/22/2020	189	23.852					
2/4/2020	54	15.814					
8/19/2020	649	3.279	362.0	3.975	5.45E+10		
8/20/2020	310	5.890					
9/8/2020	1054	3.482					
9/9/2020	81	3.250					
3/8/2021	280	12.245	195.9	14.349	1.06E+11		
3/10/2021	126	11.520					
4/5/2021	290	17.468					
4/6/2021	144	16.162					

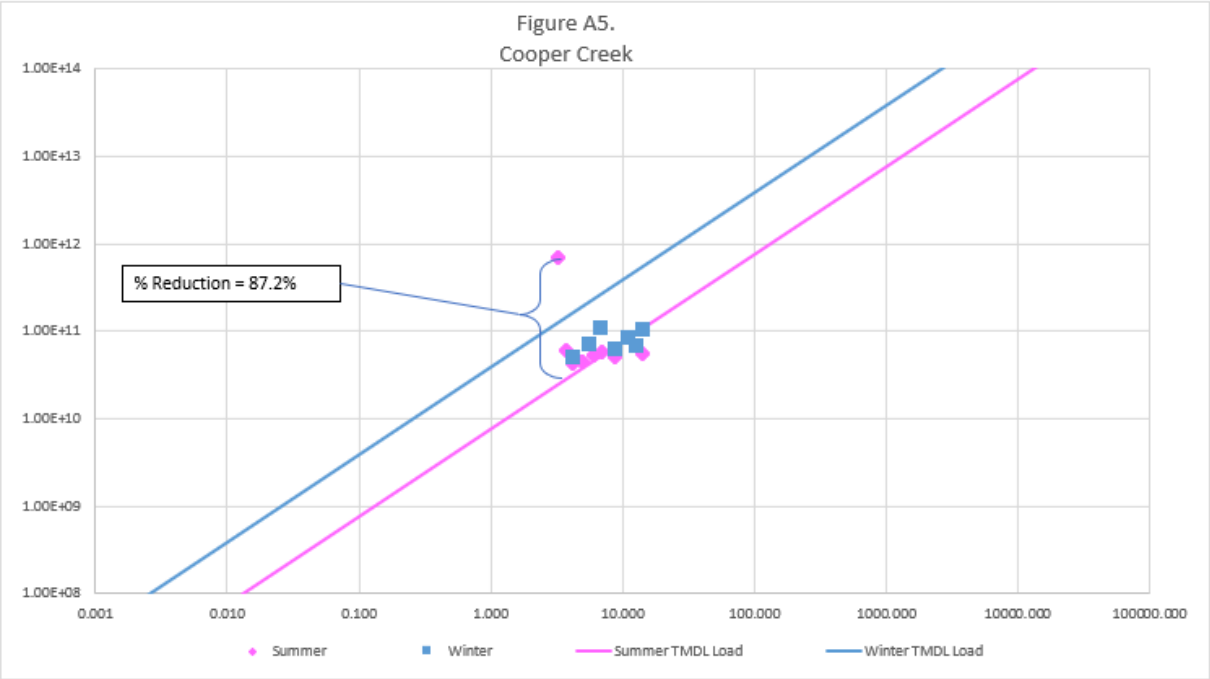
Figure A5.
Cooper Creek
1.00E+14
1.00E+13
1.00E+12
1.00E+11
1.00E+10
1.00E+09
1.00E+08
% Reduction = 87.2%
0.001
0.010
0.100
1.000
10.000
100.000
1000.000
10000.000
100000.000
Summer
Winter
Summer TMDL Load
Winter TMDL Load

Table A6. Crawford Creek at Perry Mill Rd near LaGrange, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
3/20/2018	300	32.32	111.3	22.17	9.34E+10		
3/27/2018	40	17.87					
4/2/2018	160	19.90					
4/5/2018	80	18.59					
8/2/2018	2300	57.45	337.0	20.54	2.62E+11	1.56E+11	40.7%
8/13/2018	110	8.70					
8/22/2018	300	9.55					
8/30/2018	170	6.46					
10/1/2018	130	5.62	182.1	8.21	5.66E+10		
10/18/2018	500	12.67					
10/22/2018	130	7.24					
10/29/2018	130	7.31					
12/3/2018	130	69.91	105.7	38.28	1.53E+11		
12/6/2018	300	23.45					
12/17/2018	80	34.22					
12/20/2018	40	25.56					

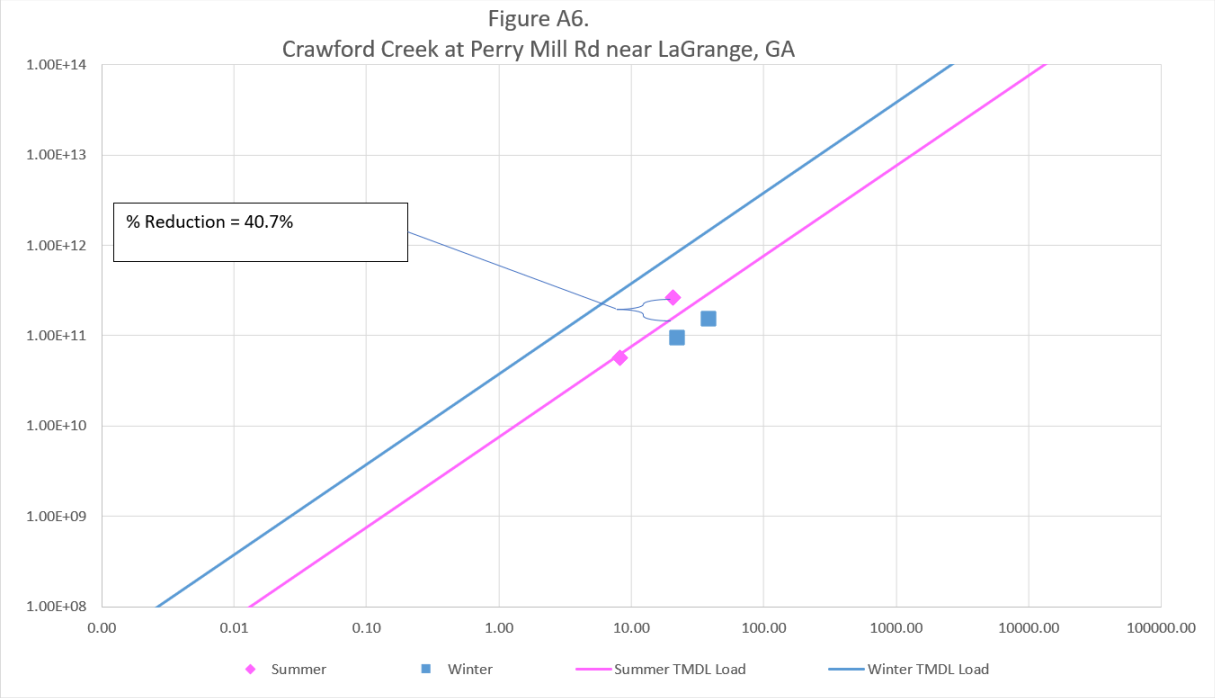

Table A7. Deer Creek at Spradlin Rd near Centralhatchee, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
3/20/2018	9000	58.26	379.8	28.84	4.15E+11		
3/27/2018	40	18.84					
4/2/2018	170	19.31					
4/5/2018	340	18.97					
8/2/2018	7000	15.26	867.8	11.16	3.66E+11	8.45E+10	77.0%
8/13/2018	90	8.44					
8/22/2018	300	7.97					
8/30/2018	3000	12.96					
10/1/2018	40	6.82	146.3	6.90	3.82E+10		
10/18/2018	110	6.95					
10/22/2018	800	6.82					
10/29/2018	130	7.02					
12/3/2018	500	21.47	63.2	18.50	4.43E+10		
12/6/2018	20	15.12					
12/17/2018	40	18.36					
12/20/2018	40	19.04					

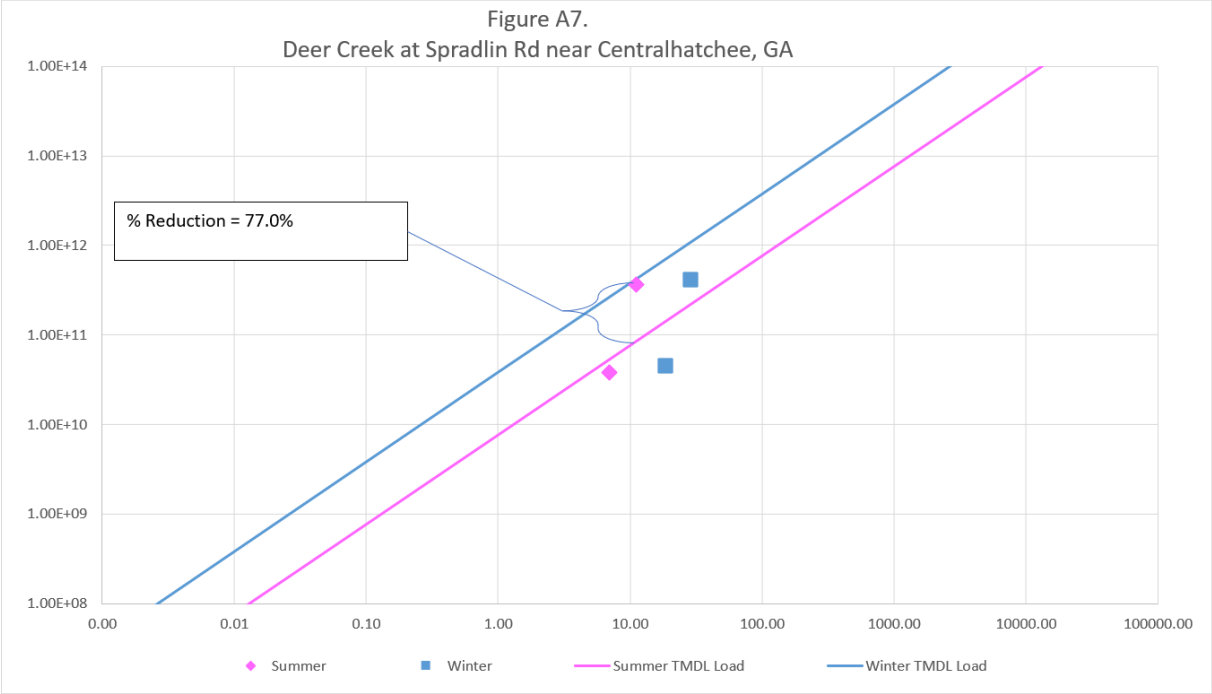

Table A8. Denny Creek at Denny Creek Rd near Ephesus, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
1/23/2019	20	43.93	31.3	18.20	2.16E+10		
1/31/2019	20	9.47					
2/4/2019	20	8.72					
2/13/2019	120	10.69					
3/7/2019	40	8.97	23.8	7.50	6.75E+09		
3/13/2019	20	7.96					
3/28/2019	20	6.57					
4/1/2019	20	6.51					
6/10/2019	700	7.87	225.2	4.19	3.57E+10	3.17E+10	11.2%
6/26/2019	170	3.58					
7/1/2019	270	2.84					
7/8/2019	80	2.47					
11/12/2019	500	3.87	71.4	3.38	9.13E+09		
11/18/2019	20	3.73					
12/2/2019	130	3.07					
12/4/2019	20	2.84					

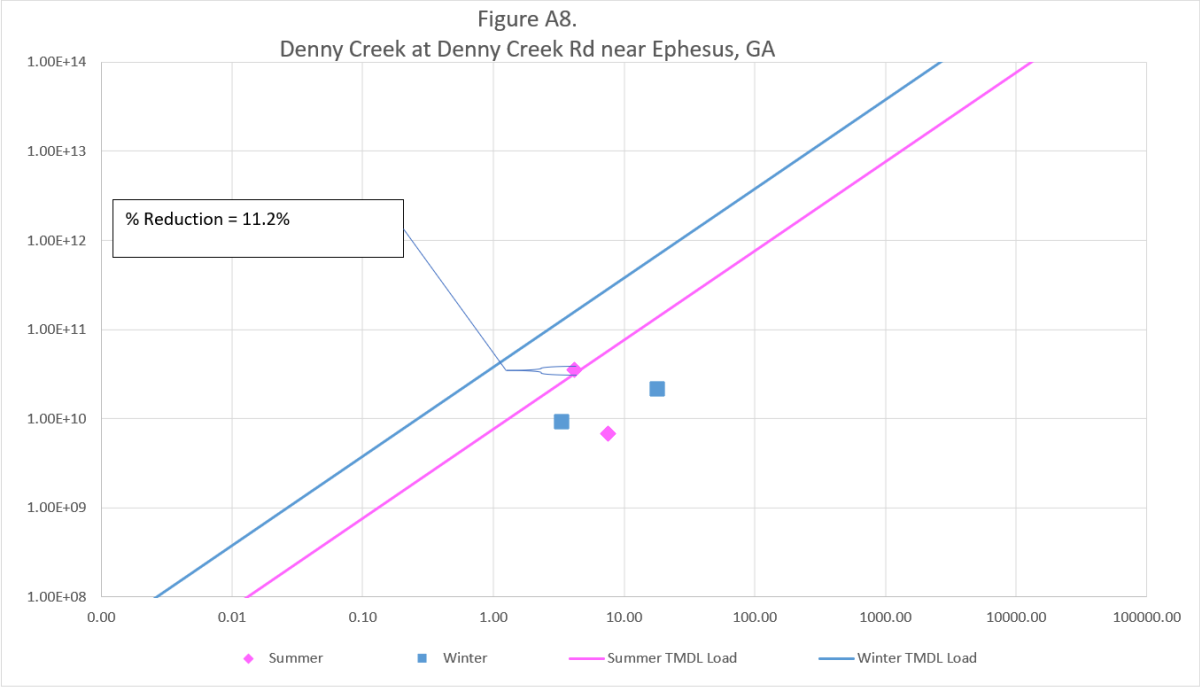

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Table A9. Dozier Creek

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
5/16/2016	200	4.268	268.746441	5.192	5.28E+10		
5/25/2016	210	6.575					
6/1/2016	230	5.186					
6/13/2016	540	4.739					
9/14/2016	8455	4.838	537.3641431	3.678	7.48E+10	2.78E+10	62.8%
9/15/2016	712	3.672					
9/20/2016	171	3.300					
9/21/2016	81	2.903					
12/8/2016	590	5.161	307.1349059	4.801	5.58E+10		
12/12/2016	210	2.779					
12/15/2016	380	6.029					
12/21/2016	189	5.235					
2/1/2017	220	11.041	245.2957585	9.261	8.60E+10		
2/6/2017	230	9.180					
2/14/2017	135	8.858					
2/21/2017	530	7.964					

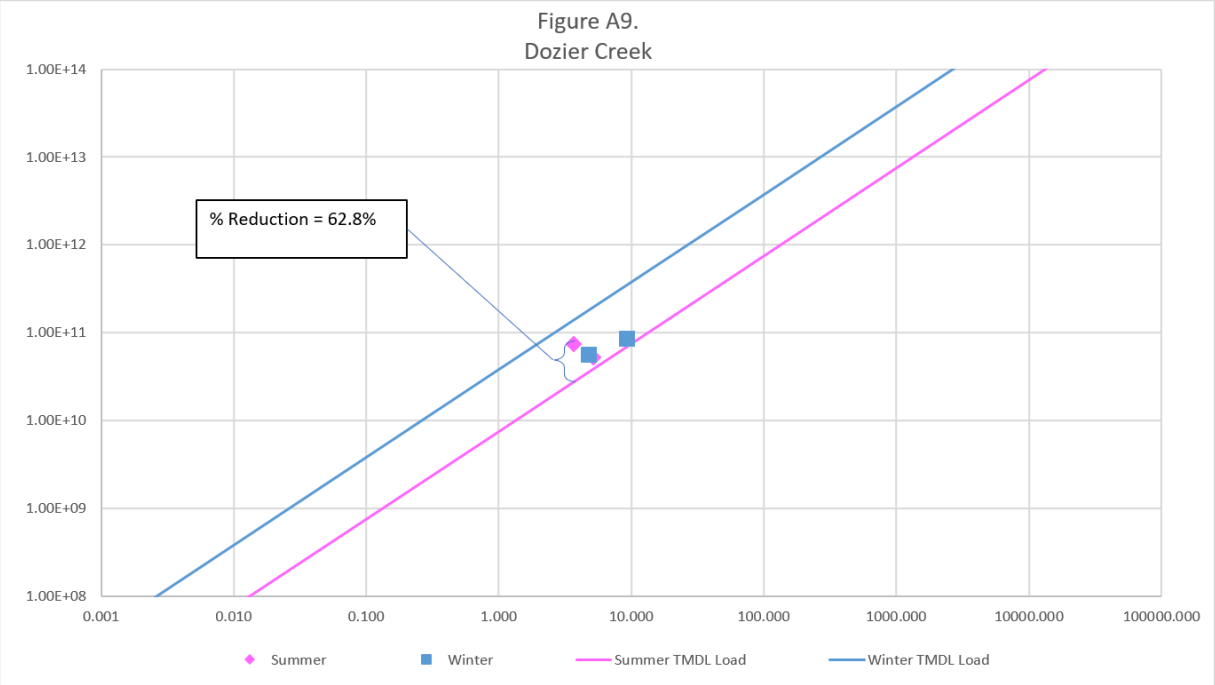

Table A10.East Trammel Branch at Bradbury Rd. near Luthersville, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
1/15/2015	80	1.84					
3/31/2015	130	5.41	399.0	10.12	1.53E+11		
4/8/2015	300	3.22					
4/13/2015	500	2.89					
4/20/2015	1300	28.94					
7/20/2015	40	0.58	236.1	0.36	3.25E+09		
7/28/2015	260	0.41					
8/4/2015	1300	0.19					
8/13/2015	230	0.27					
9/24/2015	230	0.67	335.7	0.75	9.57E+09	5.70E+09	40.4%
9/28/2015	230	0.87					
10/13/2015	300	0.91					
10/22/2015	800	0.56					
11/5/2015	500	5.55	168.2	10.65	6.78E+10		
11/9/2015	500	26.79					
11/18/2015	80	6.69					
11/23/2015	40	3.56					

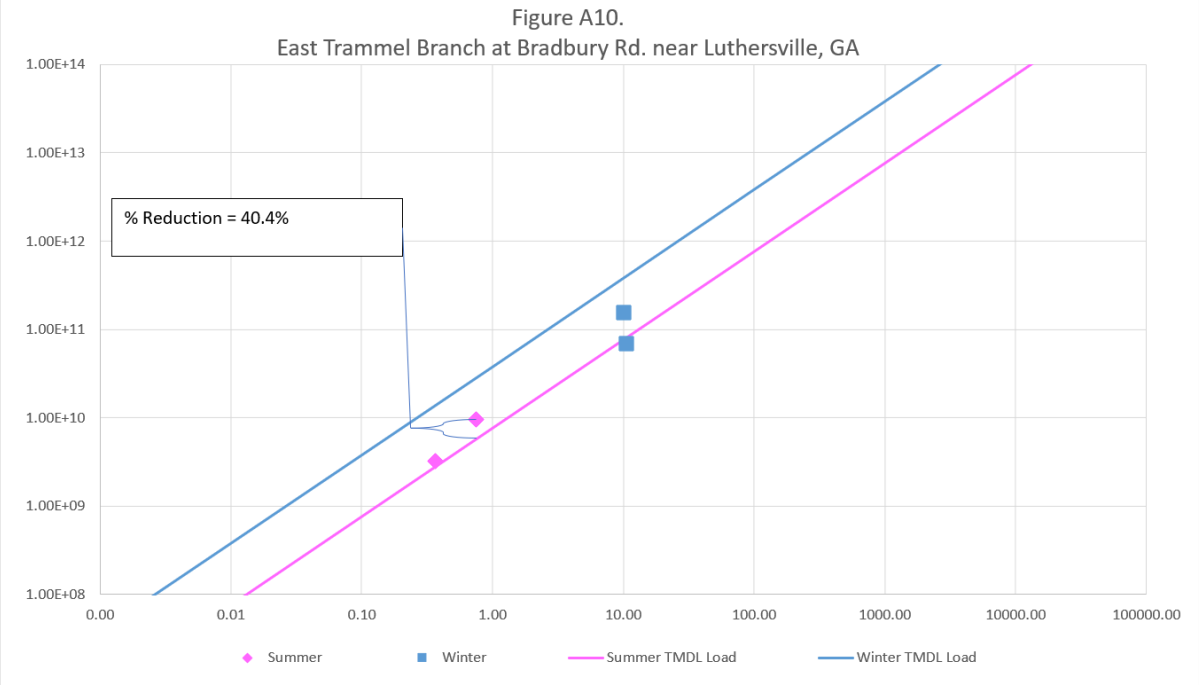

Table A11. Flatrock Creek

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading	Geometric Mean TMDL Fecal Coliform Loading	% Reduction
5/16/2016	1333	4.683	415.8	5.698	8.97E+10		
5/25/2016	144	7.216					
6/1/2016	153	5.691					
6/13/2016	1018	5.201					
9/14/2016	460	5.310	376.3	4.037	5.75E+10		
9/15/2016	370	4.030					
9/20/2016	595	3.622					
9/21/2016	198	3.186					
12/8/2016	784	5.664	435.5	5.269	8.69E+10		
12/12/2016	240	3.050					
12/15/2016	490	6.617					
12/21/2016	390	5.745					
2/1/2017	72	12.117	359.2	10.163	1.38E+11		
2/6/2017	340	10.075					
2/14/2017	126	9.721					
2/21/2017	5400	8.741					
6/12/2017	4000	5.446	1650.2	5.480	3.42E+11	4.15E+10	87.9%
6/27/2017	1545	5.909					
6/28/2017	480	4.738					
6/29/2017	2500	5.827					
8/1/2017	72	4.493	216.8	4.629	3.80E+10		
8/2/2017	310	4.166					
8/14/2017	430	6.018					
8/21/2017	230	3.839					
10/3/2017	250	2.968	266.3	3.935	3.97E+10		
10/5/2017	171	2.914					
10/26/2017	490	5.773					
11/1/2017	240	4.084					
1/31/2018	126	6.617	52.7	8.223	1.64E+10		
2/1/2018	18	5.854					
2/15/2018	63	11.818					
2/19/2018	54	8.605					
6/5/2018	350	17.427	307.0	11.028	1.28E+11		
6/6/2018	230	13.860					
6/20/2018	480	6.971					
6/21/2018	230	5.854					
8/27/2018	847	3.159	1608.9	3.002	1.83E+11		
8/28/2018	622	3.104					
9/10/2018	530	2.886					
9/11/2018	24000	2.859					
11/19/2018	260	15.494	121.7	11.777	5.42E+10		
11/28/2018	117	10.293					
12/5/2018	100	11.137					
12/6/2018	72	10.184					
5/1/2019	117	6.862	197.7	6.487	4.85E+10		
5/2/2019	180	6.508					
5/21/2019	250	6.617					
5/22/2019	290	5.963					
7/29/2019	200	3.622	232.7	3.458	3.05E+10		
7/30/2019	350	3.567					
8/19/2019	180	3.186					
11/4/2019	220	5.010	171.0	6.338	4.10E+10		
11/5/2019	200	4.847					
11/19/2019	108	8.332					
11/20/2019	180	7.161					
1/7/2020	310	21.266	160.5	19.149	1.16E+11		
1/8/2020	330	18.108					
1/22/2020	144	22.383					
2/4/2020	45	14.840					
8/19/2020	712	3.077	307.1	3.730	4.34E+10		
8/20/2020	560	5.528					
9/8/2020	310	3.268					
9/9/2020	72	3.050					
3/8/2021	144	11.491	95.7	13.465	4.88E+10		
3/10/2021	171	10.810					
4/5/2021	63	16.392					
4/6/2021	54	15.167					

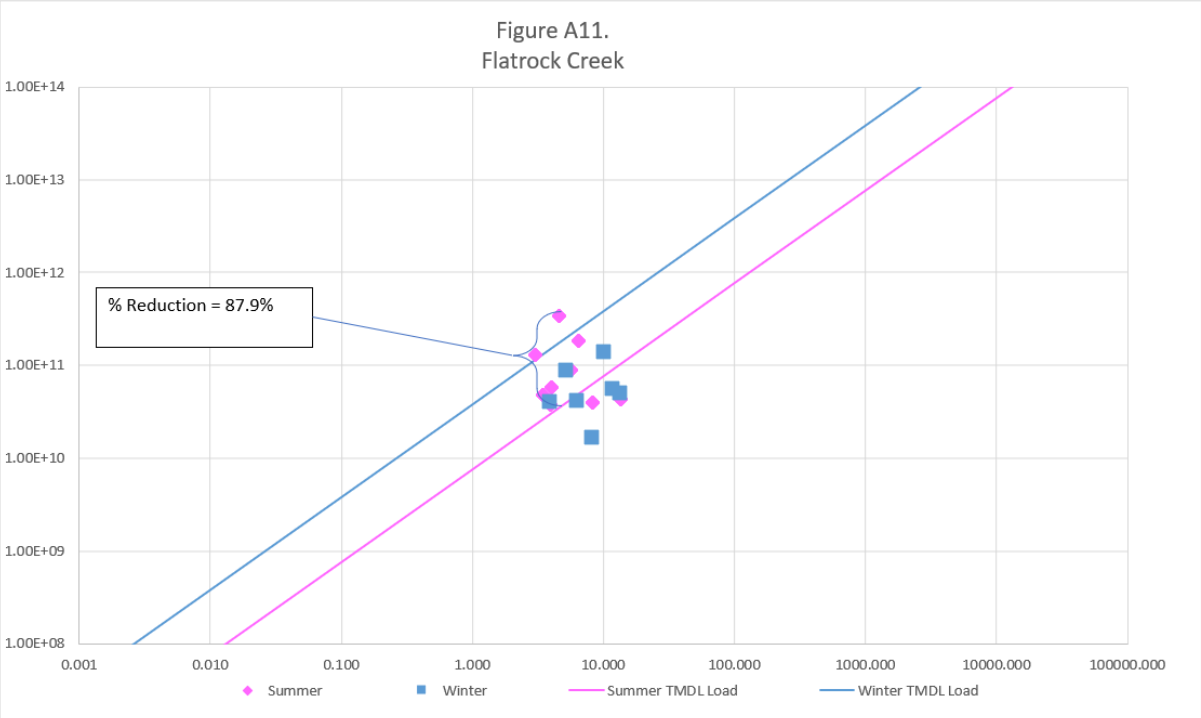
Figure A11.
Flatrock Creek
1.00E+14
1.00E+13
1.00E+12
1.00E+11
1.00E+10
1.00E+09
1.00E+08
% Reduction = 87.9%
0.001
0.010
0.100
1.000
10.000
100.000
1000.000
10000.000
100000.000
Summer
Winter
Summer TMDL Load
Winter TMDL Load

Table A12. Fort Creek at GA Hwy 116 near Pine Mountain Valley, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
1/15/2015	1400	2.04					
3/31/2015	140	6.03	434.7	11.26	1.85E+11		
4/8/2015	170	3.59					
4/13/2015	3000	3.22					
4/20/2015	500	32.23					
7/20/2015	260	0.65	616.8	0.40	9.45E+09		
7/28/2015	1100	0.46					
8/4/2015	2200	0.21					
8/13/2015	230	0.30					
9/24/2015	500	0.74	254.6	0.84	8.08E+09	6.35E+09	21.4%
9/28/2015	300	0.97					
10/13/2015	400	1.01					
10/22/2015	70	0.63					
11/5/2015	500	6.18	337.7	11.86	1.52E+11		
11/9/2015	1300	29.83					
11/18/2015	40	7.45					
11/23/2015	500	3.97					

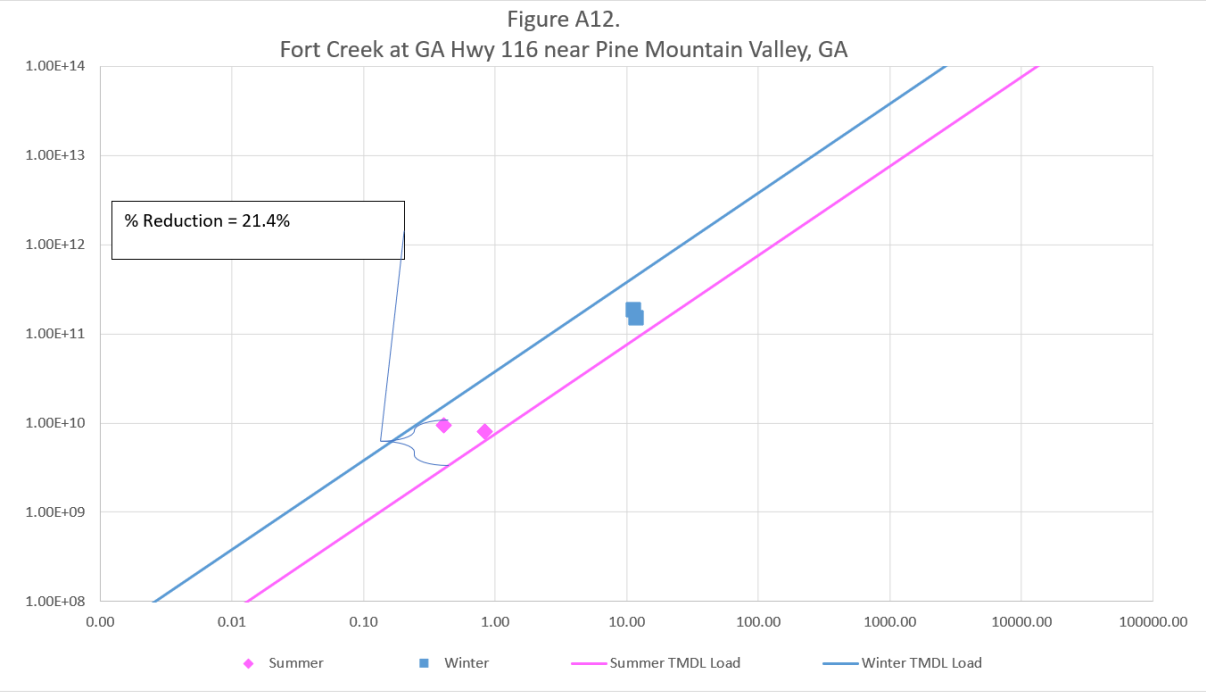

Table A13. Glade Branch at Town Creek Road near Cleveland, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
1/13/2020	500	7.37					
2/4/2020	40	3.13					
5/26/2020	80	4.08					
6/11/2020	800	4.39					
8/17/2020	1700	2.02	660.9	1.94	4.85E+10		
8/25/2020	1700	1.88					
9/1/2020	220	2.15					
9/3/2020	300	1.71					
1/13/2020	500	7.37	90.8	5.26	1.81E+10		
1/15/2020	170	6.18					
1/28/2020	20	4.34					
2/4/2020	40	3.13					
5/13/2020	300	3.84	553.1	3.89	8.15E+10		
5/26/2020	130	4.08					
6/9/2020	3000	3.27					
6/11/2020	800	4.39					
8/17/2020	2200	2.02	1099.0	1.94	8.07E+10	1.47E+10	81.8%
8/25/2020	1700	1.88					

Figure A13.
Glade Branch at Town Creek Road near Cleveland, GA

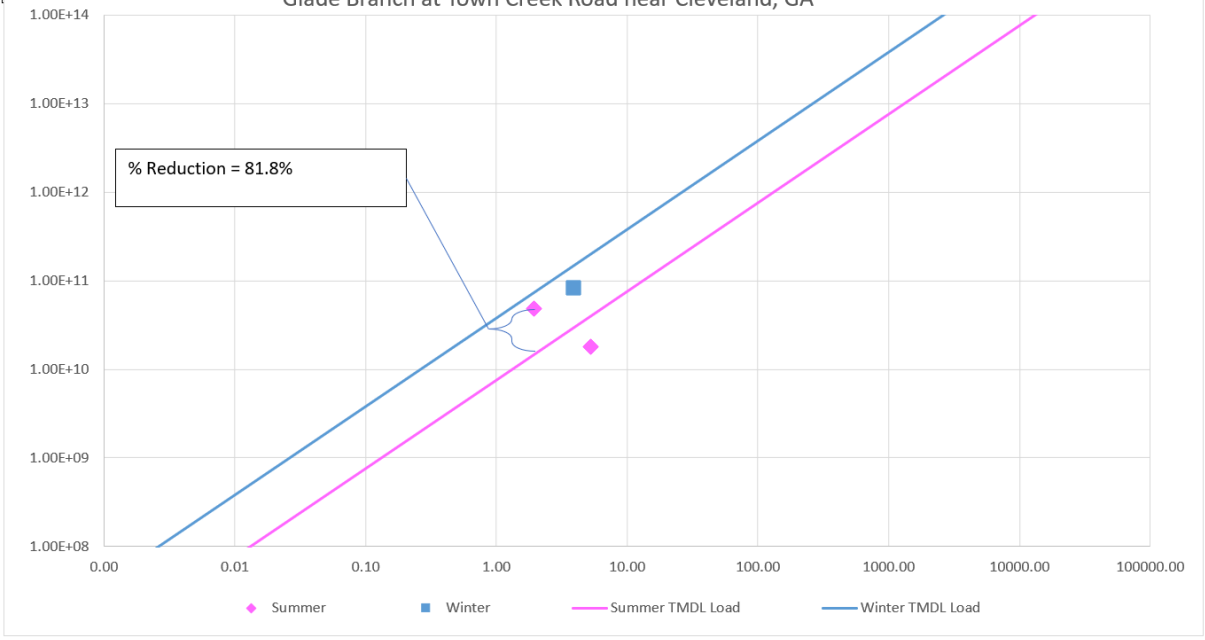

Table A14. Hannahatchee Creek at Moores Store Rd nr Richland, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
01/05/2021	230	19.40	241.2	17.52	1.60E+11		
01/11/2021	800	18.07					
01/20/2021	80	15.46					
01/25/2021	230	17.16					
04/05/2021	170	24.33	351.7	23.65	3.15E+11		
04/12/2021	300	26.70					
04/19/2021	600	19.88					
04/27/2021	500	23.69					
07/06/2021	2200	12.45	1437.4	19.79	1.08E+12	1.50E+11	86.1%
07/26/2021	270	19.14					
07/28/2021	5000	27.78					

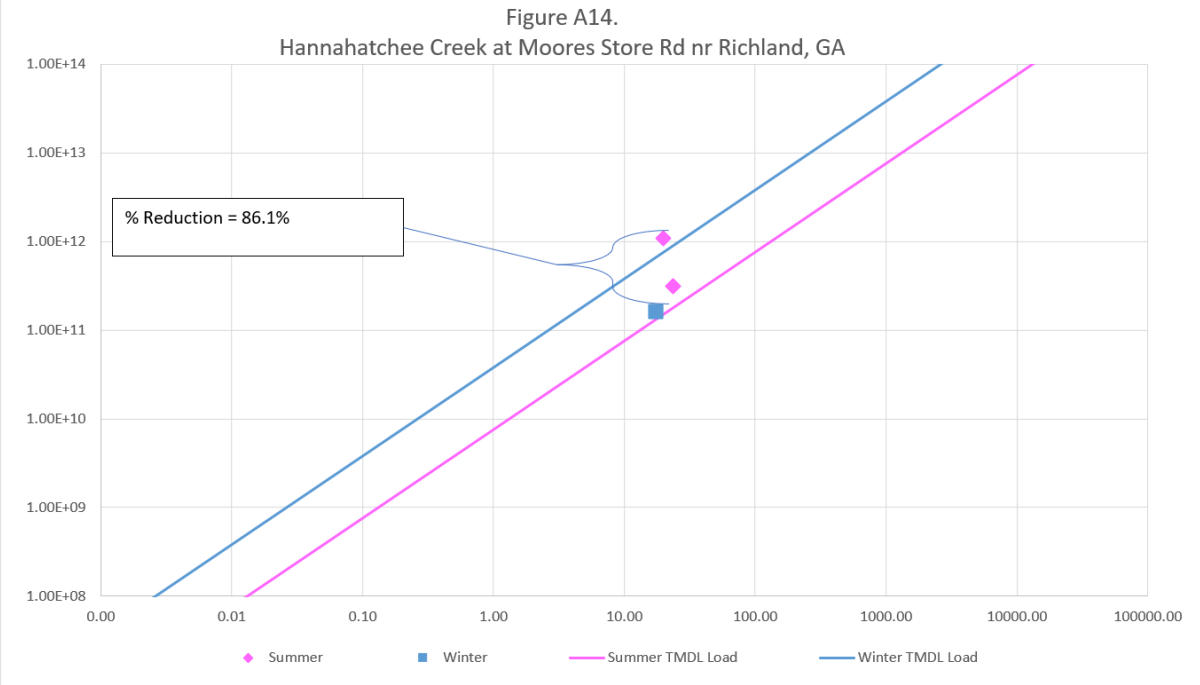

Table A15. Hillabahatchee Creek at CR 210 near Frolona, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Winter Single Sample Max Current Fecal Coliform Loading (counts/day)	Winter Single Sample Max TMDL Fecal Coliform Loading (counts/day)	% Reduction
01/20/2016	40	14.92	128.4	25.11	2.26E+10		
01/26/2016	20	22.30			1.69E+10		
02/03/2016	17000	45.01			2.90E+13		
02/09/2016	20	18.22			1.38E+10		
05/18/2016	40	12.59	40.0	9.17			
05/26/2016	40	9.35					
06/09/2016	20	8.03					
06/13/2016	80	6.71					
08/25/2016	130	3.80	77.1	3.06			
08/29/2016	40	3.09					
09/06/2016	170	2.86					
09/08/2016	40	2.49					
12/01/2016	50000	6.83	567.9	5.64	1.29E+13		
12/05/2016	1300	8.03			3.95E+11		
12/20/2016	80	3.79			1.15E+10		
12/28/2016	20	3.90			2.95E+09		
05/22/2017	2200	13.96	1274.7	11.81			
05/31/2017	300	9.83					
06/05/2017	50000	15.40					
06/15/2017	80	8.03					
08/24/2017	230	7.49	67.8	9.23			
08/29/2017	20	7.01					
09/14/2017	230	13.19					
11/01/2017	20	8.03	38.0	7.79	6.08E+09		
11/06/2017	130	7.55			3.72E+10		
11/14/2017	40	7.79			1.18E+10		
11/20/2017	20	7.79			5.90E+09		
03/20/2018	50000	51.72	439.8	25.61	9.79E+13		
03/27/2018	80	16.72			5.06E+10		
04/02/2018	170	17.14			1.10E+11		
04/05/2018	55	16.84			3.51E+10		
08/02/2018	2200	13.55	455.7	9.90			
08/13/2018	70	7.49					
08/22/2018	40	7.07					
08/30/2018	7000	11.51					
10/01/2018	40	6.05	43.3	6.13			
10/18/2018	110	6.17					
10/22/2018	40	6.05					
10/29/2018	20	6.23					
11/20/2018	160	12.11	46.5	15.56	7.33E+10		
12/03/2018	170	19.06			1.23E+11		
12/06/2018	20	13.43			1.02E+10		
12/17/2018	20	16.30			1.23E+10		
12/20/2018	20	16.90			1.28E+10		
01/23/2019	110	127.06	93.0	52.65	5.29E+11		
01/31/2019	20	27.39			2.07E+10		
02/04/2019	20	25.23			1.91E+10		
02/13/2019	1700	30.93			1.99E+12		
03/07/2019	20	25.95	22.1	21.70	1.96E+10		
03/13/2019	20	23.02			1.74E+10		
03/28/2019	30	19.00			2.16E+10		
04/01/2019	20	18.82			1.42E+10		
06/10/2019	500	22.78	63.2	12.12			
06/26/2019	40	10.37					
07/01/2019	40	8.21					
07/08/2019	20	7.13					
11/12/2019	20	11.21	23.8	9.77	8.49E+09		
11/18/2019	20	10.79			8.17E+09		
12/02/2019	40	8.87			1.34E+10		
12/04/2019	20	8.21			6.22E+09		
01/23/2020	20	26.61	186.1	67.20	2.01E+10		
01/28/2020	40	25.23			3.82E+10		
02/11/2020	3000	92.90			1.05E+13		
02/19/2020	500	124.07			2.35E+12		
06/23/2020	1700	13.37	297.7	11.25			
06/29/2020	220	11.09					
07/07/2020	300	10.61					
07/09/2020	70	9.95					
11/17/2020	40	6.71	43.3	9.11	1.02E+10		
11/23/2020	20	6.53			4.95E+09		
12/03/2020	110	12.77			5.32E+10		
12/17/2020	40	10.43			1.58E+10		
01/26/2021	160000	22.48	4938.6	21.92	1.36E+14	3.40E+12	97.50%
01/27/2021	13000	28.35			1.40E+13		
02/02/2021	130	13.13			6.46E+10		
02/16/2021	2200	23.73			1.98E+12		
05/18/2021	40	16.24	61.9	14.80			
05/19/2021	20	15.40					
06/08/2021	80	12.83					
06/10/2021	230	14.74					
07/26/2021	300	10.31	148.0	9.50			
07/28/2021	4000	10.67					
08/03/2021	20	8.39					
08/12/2021	20	8.63					

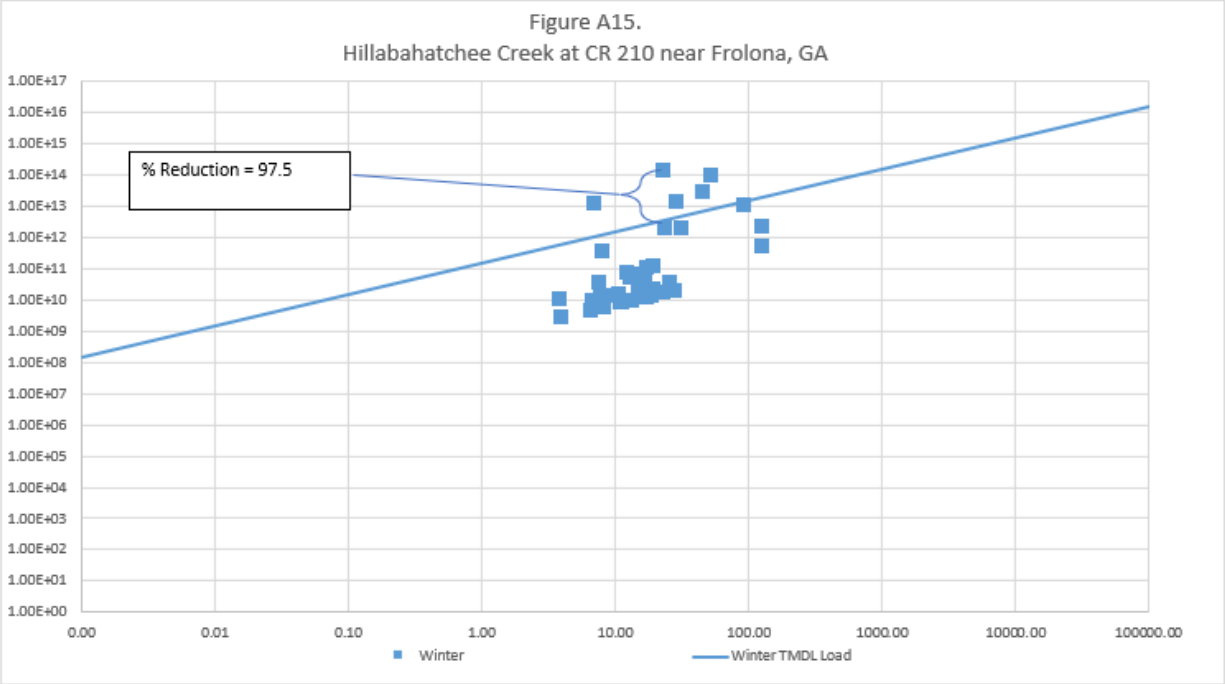
Figure A15.
Hillabahatchee Creek at CR 210 near Frolona, GA
% Reduction = 97.5
1.00E+17
1.00E+16
1.00E+15
1.00E+14
1.00E+13
1.00E+12
1.00E+11
1.00E+10
1.00E+09
1.00E+08
1.00E+07
1.00E+06
1.00E+05
1.00E+04
1.00E+03
1.00E+02
1.00E+01
1.00E+00
0.00
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
100000.00
Winter
Winter TMDL Load

Table A16. Hillabahatchee Creek at CR 210 near Frolona, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Winter Single Sample Max Current Fecal Coliform Loading (counts/day)	Winter Single Sample Max TMDL Fecal Coliform Loading (counts/day)	% Reduction
01/20/2016	40	102.30	128.4	172.15	1.55E+11		
01/26/2016	20	152.84			1.16E+11		
02/03/2016	17000	308.55			1.99E+14		
02/09/2016	20	124.90			9.46E+10		
05/18/2016	40	86.28	40.0	62.86			
05/26/2016	40	64.09					
06/09/2016	20	55.05					
06/13/2016	80	46.02					
08/25/2016	130	26.05	77.1	20.97			
08/29/2016	40	21.16					
09/06/2016	170	19.60					
09/08/2016	40	17.09					
12/01/2016	50000	46.84	567.9	38.66	8.86E+13		
12/05/2016	1300	55.05			2.71E+12		
12/20/2016	80	26.01			7.88E+10		
12/28/2016	20	26.75			2.02E+10		
05/22/2017	2200	95.73	1274.7	80.94			
05/31/2017	300	67.38					
06/05/2017	50000	105.59					
06/15/2017	80	55.05					
08/24/2017	230	51.36	101.9	63.27			
08/29/2017	20	48.07					
09/14/2017	230	90.39					
11/01/2017	20	55.05	38.0	53.41	4.17E+10		
11/06/2017	130	51.77			2.55E+11		
11/14/2017	40	53.41			8.09E+10		
11/20/2017	20	53.41			4.04E+10		
03/20/2018	50000	354.57	439.8	175.54	6.71E+14		
03/27/2018	80	114.63			3.47E+11		
04/02/2018	170	117.50			7.56E+11		
04/05/2018	55	115.45			2.40E+11		
08/02/2018	2200	92.85	455.7	67.89			
08/13/2018	70	51.36					
08/22/2018	40	48.48					
08/30/2018	7000	78.88					
10/01/2018	40	41.50	43.3	42.01			
10/18/2018	110	42.32					
10/22/2018	40	41.50					
10/29/2018	20	42.73					
11/20/2018	160	82.99	46.5	106.66	5.03E+11		
12/03/2018	170	130.65			8.41E+11		
12/06/2018	20	92.03			6.97E+10		
12/17/2018	20	111.75			8.46E+10		
12/20/2018	20	115.86			8.77E+10		
01/23/2019	110	871.01	93.0	360.94	3.63E+12		
01/31/2019	20	187.76			1.42E+11		
02/04/2019	20	172.97			1.31E+11		
02/13/2019	1700	212.00			1.36E+13		
03/07/2019	20	177.90	22.1	148.73	1.35E+11		
03/13/2019	20	157.77			1.19E+11		
03/28/2019	30	130.24			1.48E+11		
04/01/2019	20	129.01			9.77E+10		
06/10/2019	500	156.13	63.2	83.10			
06/26/2019	40	71.08					
07/01/2019	40	56.29					
07/08/2019	20	48.89					
11/12/2019	20	76.83	23.8	66.97	5.82E+10		
11/18/2019	20	73.95			5.60E+10		
12/02/2019	40	60.81			9.21E+10		
12/04/2019	20	56.29			4.26E+10		
01/23/2020	20	182.42	186.1	460.67	1.38E+11		
01/29/2020	40	172.97			2.62E+11		
02/11/2020	3000	636.83			7.23E+13		
02/19/2020	500	850.47			1.61E+13		
06/23/2020	1700	91.62	297.7	77.14			
06/29/2020	220	76.01					
07/07/2020	300	72.72					
07/09/2020	70	68.20					
11/17/2020	40	46.02	43.3	62.45	6.97E+10		
11/23/2020	20	44.78			3.39E+10		
12/03/2020	110	87.51			3.64E+11		
12/17/2020	40	71.49			1.08E+11		
01/26/2021	160000	154.07	4938.6	150.27	9.33E+14	2.33E+13	97.50%
01/27/2021	13000	194.33			9.56E+13		
02/02/2021	130	89.98			4.43E+11		
02/16/2021	2200	162.70			1.35E+13		
05/18/2021	40	111.34	61.9	101.48			
05/19/2021	20	105.59					
06/08/2021	80	87.92					
06/10/2021	230	101.07					
07/26/2021	300	70.67	148.0	65.12			
07/28/2021	4000	73.13					
08/03/2021	20	57.52					
08/12/2021	20	59.16					

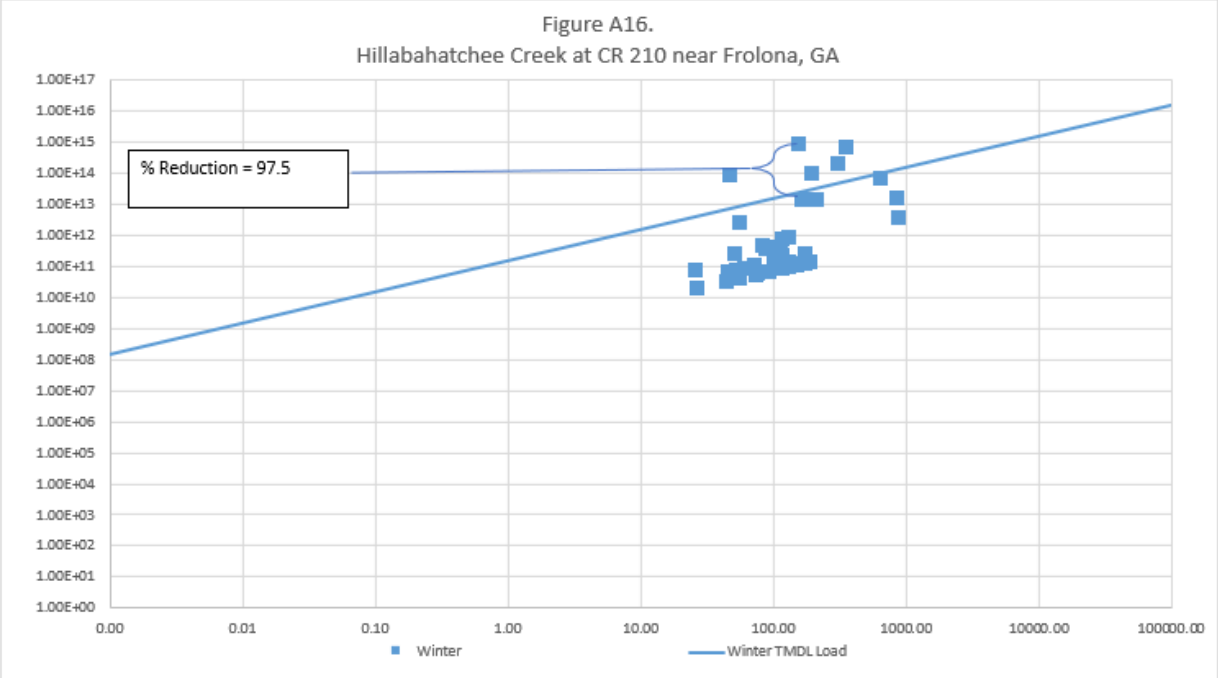
Figure A16.
Hillabahatchee Creek at CR 210 near Frolona, GA
% Reduction = 97.5
1.00E+17
1.00E+16
1.00E+15
1.00E+14
1.00E+13
1.00E+12
1.00E+11
1.00E+10
1.00E+09
1.00E+08
1.00E+07
1.00E+06
1.00E+05
1.00E+04
1.00E+03
1.00E+02
1.00E+01
1.00E+00
0.00
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
100000.00
Winter
Winter TMDL Load

Table A17. House Creek at Monument Rd

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
01/20/2016	20	53.94	140.0	88.67	4.70E+11		
01/26/2016	20	81.92					
02/03/2016	24000	165.20					
02/09/2016	40	53.60					
05/18/2016	290	20.30	431.9	12.90	2.11E+11		
05/26/2016	300	12.91					
06/09/2016	500	10.96					
06/13/2016	800	7.45					
08/25/2016	1700	3.81	1685.7	2.30	1.47E+11	1.74E+10	88.1%
08/29/2016	1900	2.32					
09/06/2016	5000	1.65					
09/08/2016	500	1.41					
12/01/2016	230	9.74	132.8	7.92	3.98E+10		
12/05/2016	130	12.74					
12/20/2016	130	5.43					
12/28/2016	80	3.78					

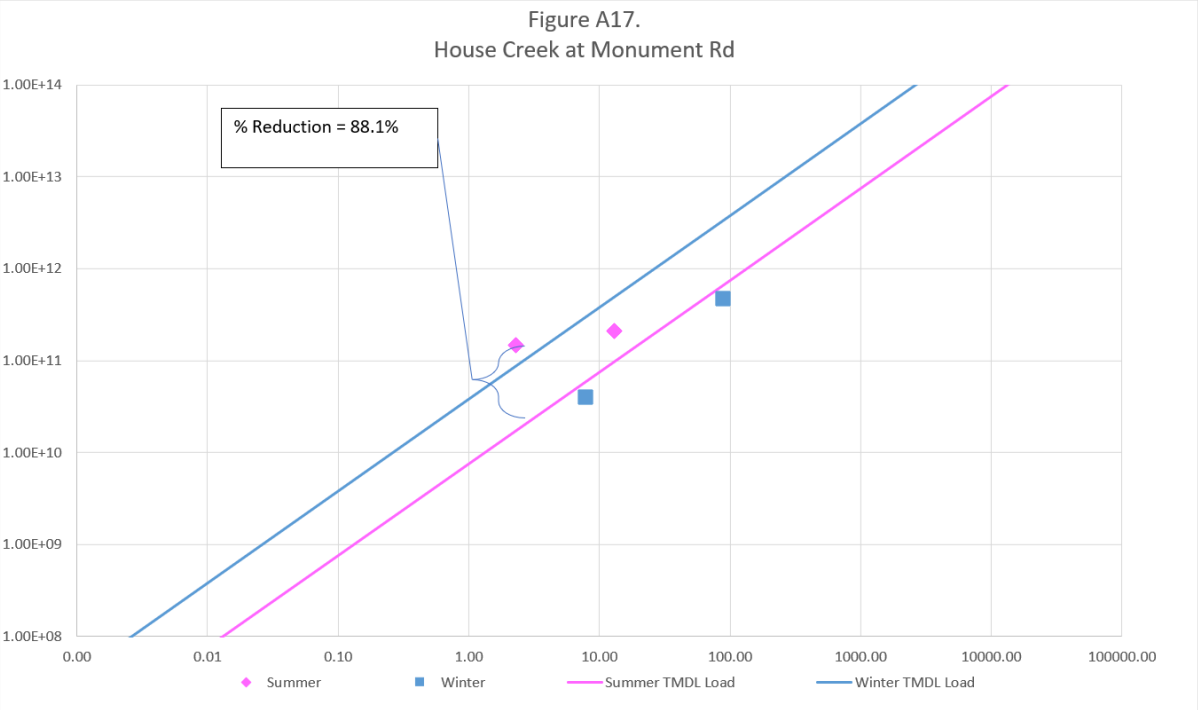

Table A18. Lick Log Creek at Laird Road near Powder Springs, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
02/04/2013	80	31.73	166.7311626	87.42	5.52E+11		
02/12/2013	300	145.99					
02/19/2013	140	27.73					
02/26/2013	230	144.21					
07/23/2013	500	59.24	440.0558684	20.41	3.40E+11	1.54E+11	54.6%
07/29/2013	300	11.45					
08/08/2013	500	10.89					
08/12/2013	500	13.45					
09/30/2013	220	7.01					
12/05/2013	40	24.41	131.5195752	48.76	2.43E+11		
12/09/2013	1100	103.39					
12/16/2013	170	43.26					
12/19/2013	40	23.96					

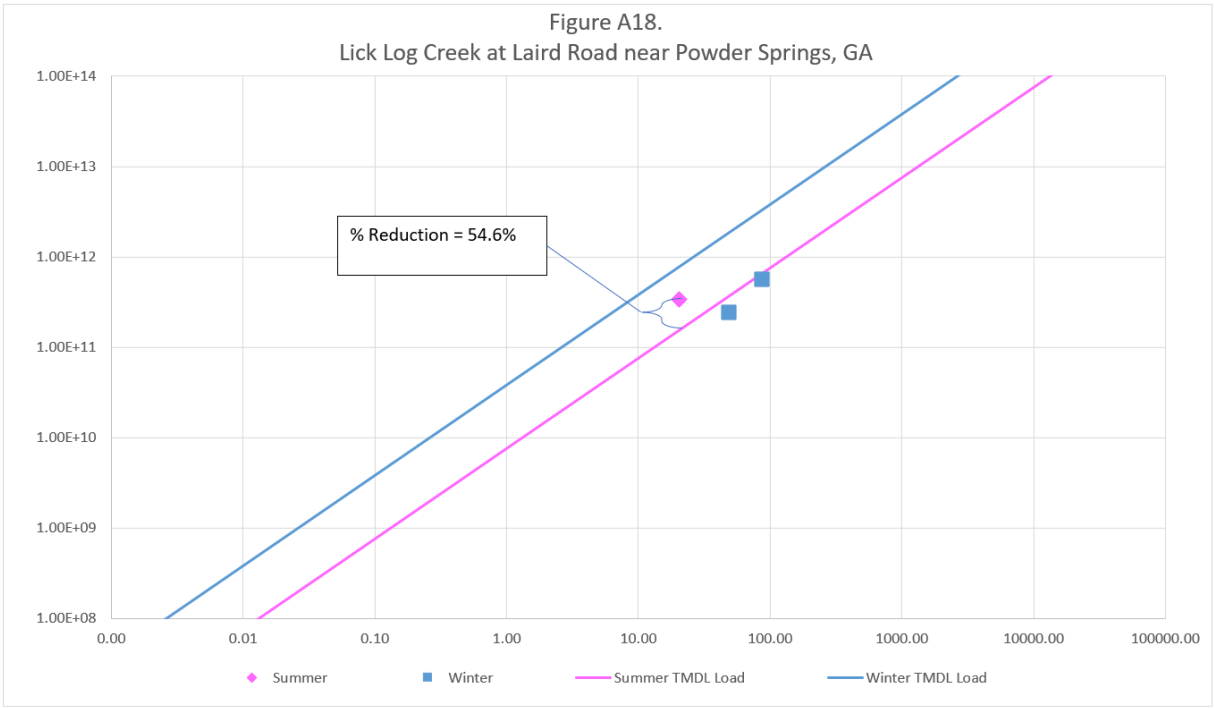

Table A19. Milligan Creek at Star Point Rd nr Roopville, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
08/24/2017	220	3.351	174.1	4.128	2.72E+10		
08/29/2017	80	3.137					
09/14/2017	300	5.898					
05/22/2017	500	6.246	325.3	5.281	6.50E+10	4.00E+10	38.5%
05/31/2017	800	4.396					
06/05/2017	700	6.890					
06/15/2017	40	3.592					
11/01/2017	80	3.592	40.0	3.485	5.28E+09		
11/06/2017	20	3.378					
11/14/2017	80	3.485					
11/20/2017	20	3.485					

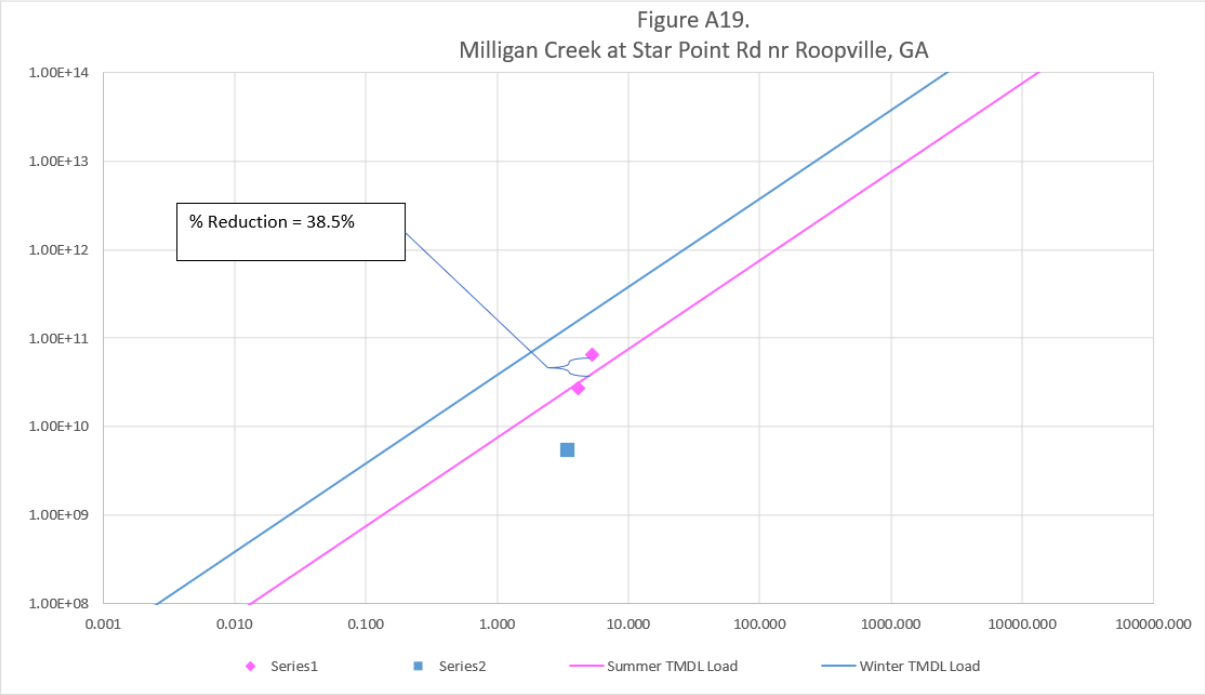

Table A20. North Prong Kolomoki Creek at Kolomoki Rd near Bluffton, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
01/06/2016	20	54.91	84.6	50.00	1.60E+11		
01/11/2016	400	55.59					
01/13/2016	80	43.60					
01/20/2016	80	45.91					
04/04/2016	220	113.90	288.0	57.87	6.31E+11		
04/07/2016	1700	58.45					
04/28/2016	230	32.56					
05/02/2016	80	26.57					
07/14/2016	130	11.69	364.0	13.69	1.89E+11	1.04E+11	45.1%
07/18/2016	500	6.54					
07/25/2016	300	20.57					
07/26/2016	900	15.94					
10/11/2016	230	4.56	276.2	5.89	6.16E+10		
10/13/2016	220	5.49					
10/17/2016	500	6.42					
10/31/2016	230	7.08					

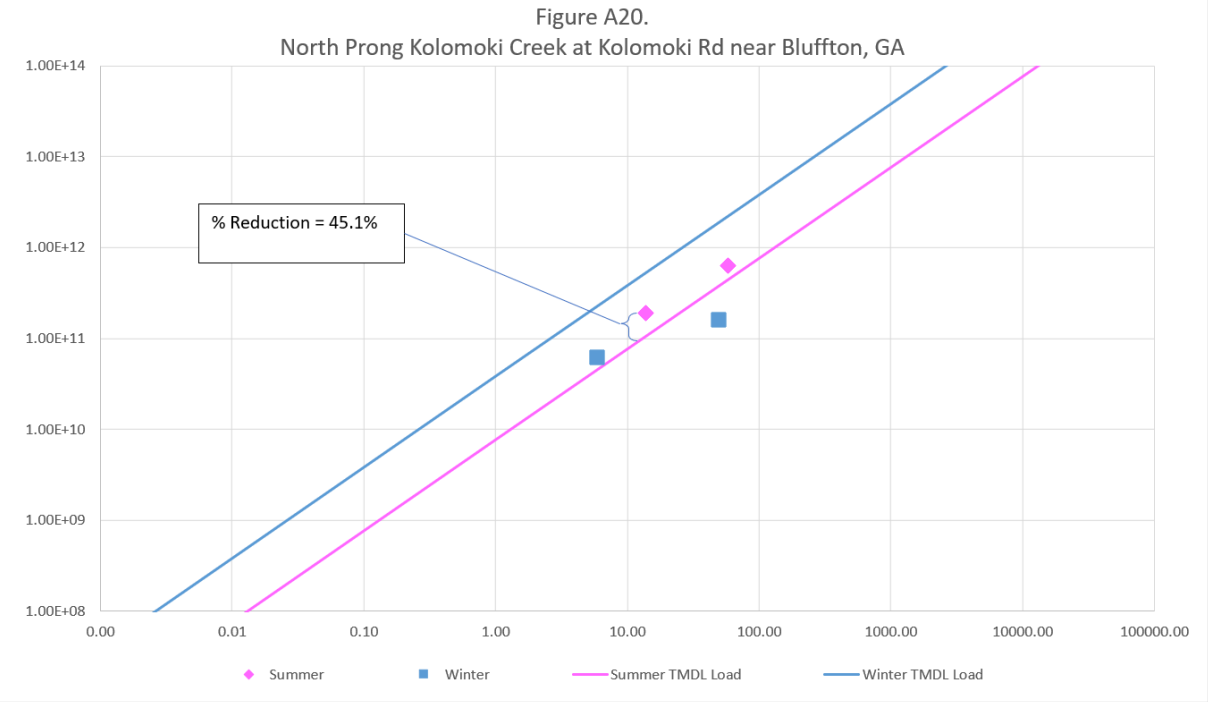

Table A21. Pataula Creek at U.S. Hwy 27 near Lumpkin, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
01/05/2021	220	81.85	216.0	72.84	5.96E+11		
01/11/2021	110	71.34					
01/20/2021	300	62.33					
01/25/2021	300	75.84					
04/05/2021	230	85.11	517.6	131.29	2.57E+12		
04/12/2021	800	252.82					
04/19/2021	300	75.34					
04/27/2021	1300	111.89					
07/06/2021	900	66.58	608.2	56.40	1.30E+12	4.27E+11	67.1%
07/26/2021	500	47.56					
07/28/2021	500	55.07					

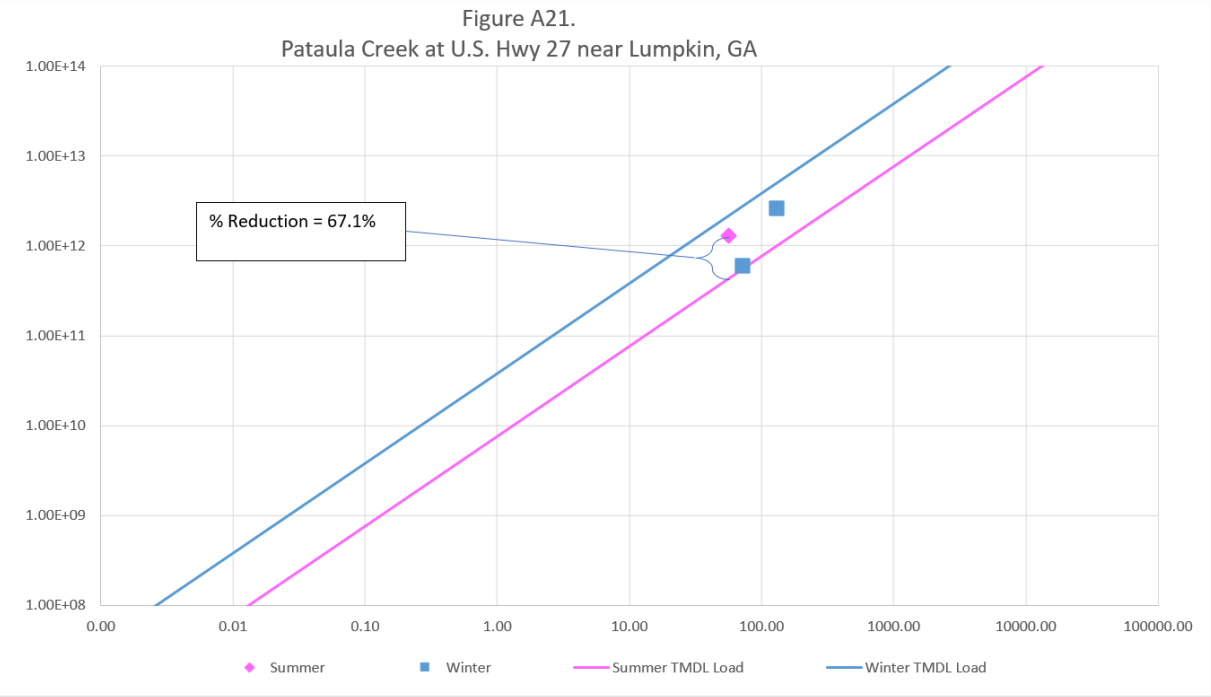

Table A22. Sand Creek at Yates Rd near West Point, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
01/20/2016	70	14.67	205.7	27.30	2.13E+11		
01/26/2016	40	22.28					
02/03/2016	16000	44.94					
02/09/2016	40	14.58					
05/18/2016	170	5.52	232.6	4.00	3.53E+10		
05/26/2016	220	3.51					
06/09/2016	340	2.98					
06/13/2016	230	2.03					
08/25/2016	300	1.04	1173.7	0.71	3.14E+10	5.34E+09	83.0%
08/29/2016	2300	0.63					
09/06/2016	550	0.45					
09/08/2016	5000	0.38					
12/01/2016	1700	2.65	464.1	2.53	4.45E+10		
12/05/2016	700	3.47					
12/20/2016	130	1.48					
12/28/2016	300	1.03					

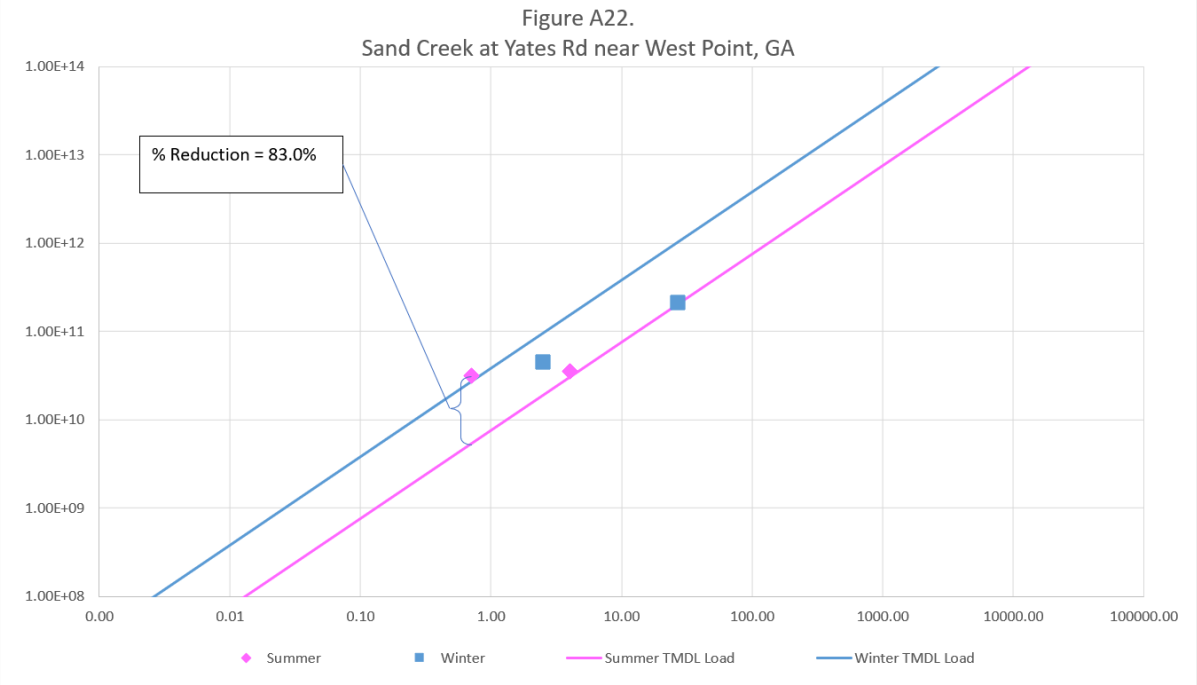

Table A23. Standing Boy Creek at Fortson Rd near Cataula, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
03/20/2018	230	31.23	98.9	23.92	8.96E+10		
03/27/2018	40	18.68					
04/02/2018	130	21.86					
04/05/2018	80	18.24					
08/02/2018	1800	98.94	1669.9	46.71	2.95E+12	3.54E+11	88.0%
08/13/2018	1800	26.36					
08/22/2018	800	14.84					
08/30/2018	3000	29.98					
10/01/2018	1700	12.26	590.5	13.68	3.06E+11		
10/18/2018	1100	14.10					
10/22/2018	500	14.69					
10/29/2018	130	14.55					
12/03/2018	500	45.11	441.4	46.49	7.77E+11		
12/06/2018	110	27.62					
12/17/2018	300	66.75					
12/20/2018	2300	93.04					

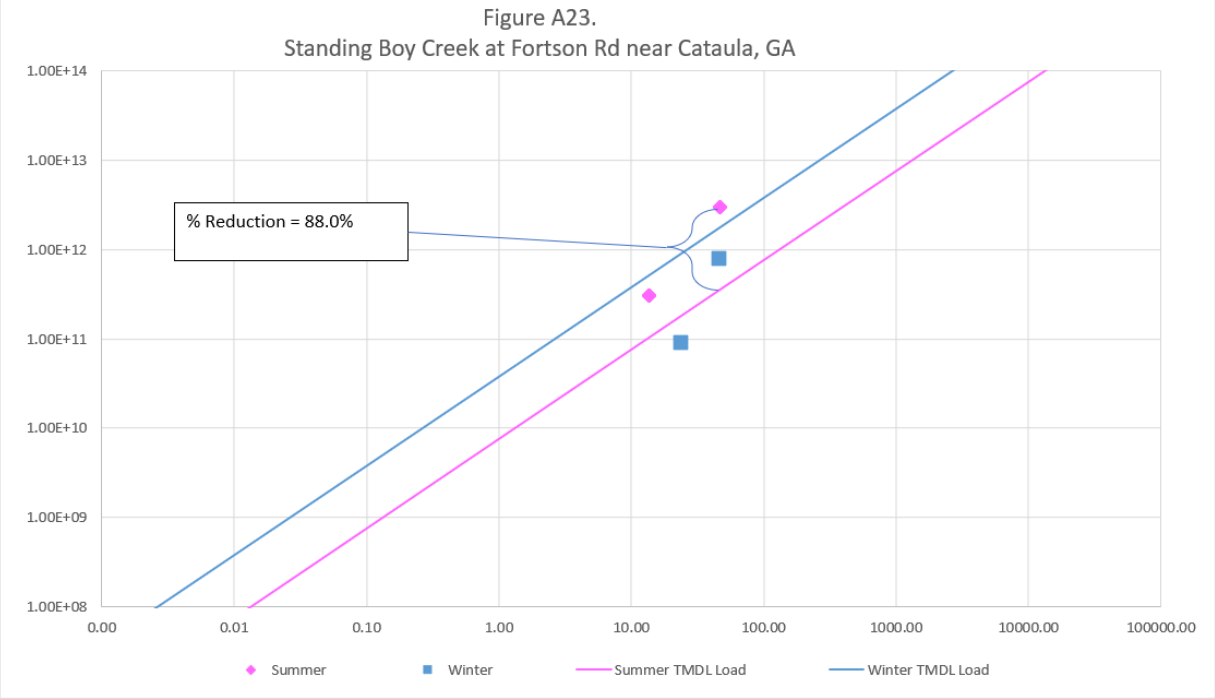

Table A24. Tar River

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
5/16/2016	135	1.547	245.4132113	1.882	1.75E+10	1.42E+10	18.5%
5/25/2016	171	2.383					
6/1/2016	1027	1.879					
6/13/2016	153	1.717					
9/14/2016	153	1.753	34.9212213	1.333	1.76E+09		
9/15/2016	10	1.331					
9/20/2016	36	1.196					
9/21/2016	27	1.052					
12/8/2016	330	1.870	141.7874159	1.740	9.34E+09		
12/12/2016	63	1.007					
12/15/2016	135	2.185					
12/21/2016	144	1.897					
2/1/2017	72	4.001	64.67474015	3.356	8.22E+09		
2/6/2017	250	3.327					
2/14/2017	27	3.210					
2/21/2017	36	2.886					

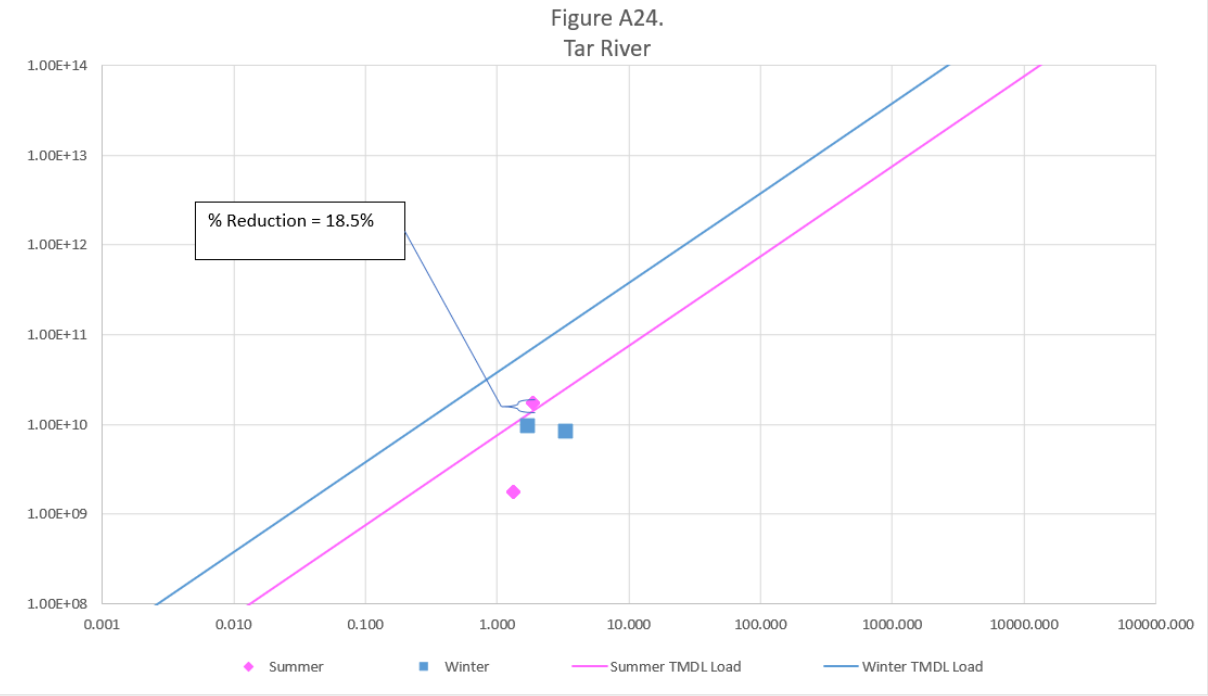

Table A25. Tate Creek at Powder Springs Rd near Suches, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
1/23/2019	20	43.93	31.3	18.20	2.16E+10		
1/31/2019	20	9.47					
2/4/2019	20	8.72					
2/13/2019	120	10.69					
3/7/2019	40	8.97	23.8	7.50	6.75E+09		
3/13/2019	20	7.96					
3/28/2019	20	6.57					
4/1/2019	20	6.51					
6/10/2019	700	7.87	225.2	4.19	3.57E+10	3.17E+10	11.2%
6/26/2019	170	3.58					
7/1/2019	270	2.84					
7/8/2019	80	2.47					
11/12/2019	500	3.87	71.4	3.38	9.13E+09		
11/18/2019	20	3.73					
12/2/2019	130	3.07					
12/4/2019	20	2.84					

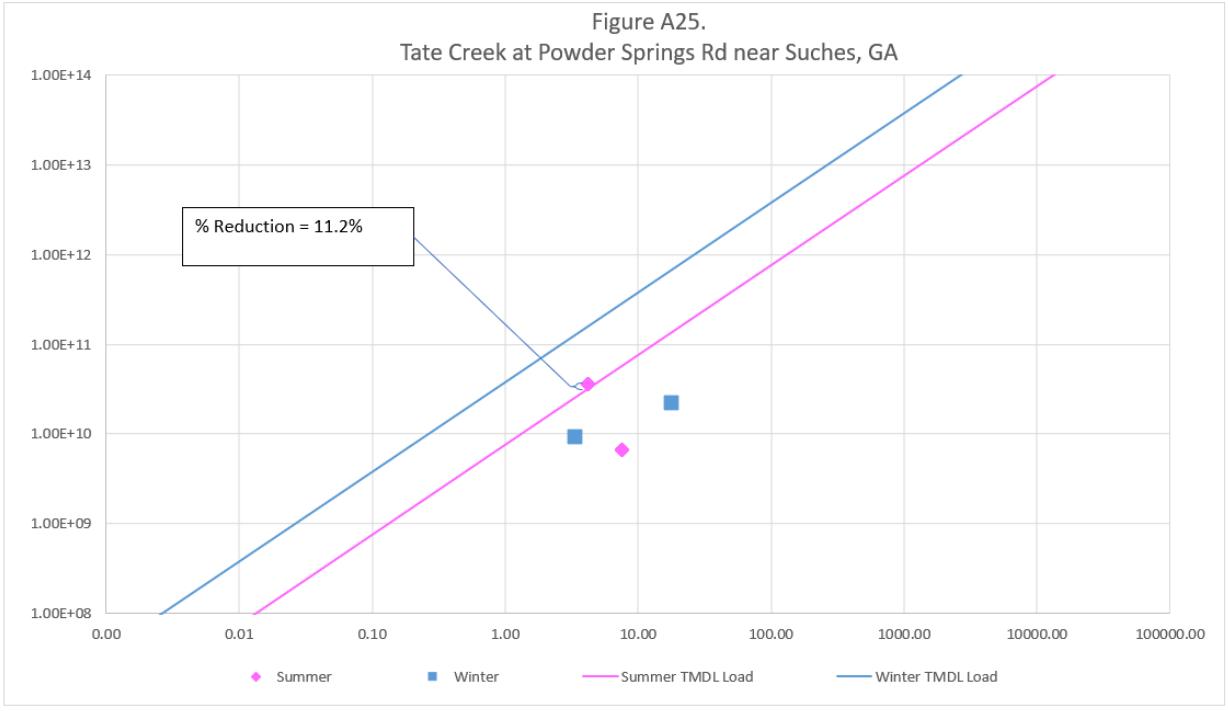

Table A26. Town Branch at Brewer Road near Villa Rica, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
02/04/2013	45	4.89	45.1	10.96	1.87E+10		
02/12/2013	20	21.61					
02/19/2013	20	6.37					
02/26/2013	230	63.79					
07/23/2013	40	5.24	221.2	4.65	3.89E+10	3.52E+10	9.6%
07/29/2013	200	3.93					
08/08/2013	230	4.76					
08/12/2013	1300	5.25					
09/30/2013	500	2.87					
12/05/2013	130	8.77	148.5	10.26	5.77E+10		
12/09/2013	1700	15.10					
12/16/2013	110	6.93					
12/19/2013	20	5.23					

Figure A26.
Town Branch at Brewer Road near Villa Rica, GA

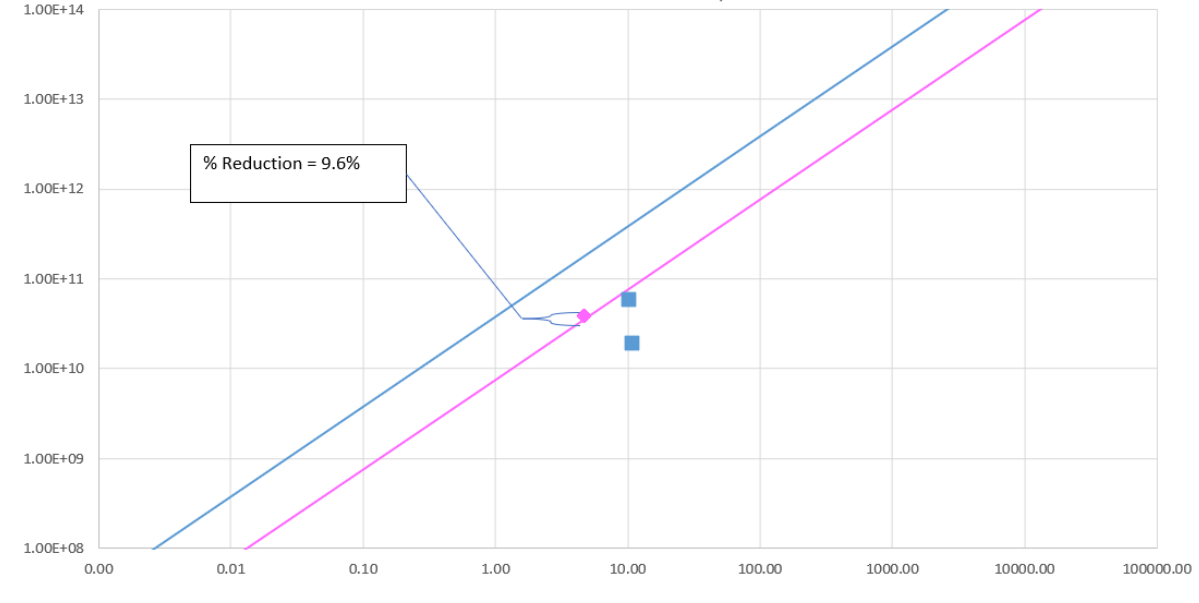

Table A27. Town Creek nr Town Creek Rd nr Woodland, AL

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Winter Single Sample Max Current Fecal Coliform Loading (counts/days)	Winter Single Sample Max TMDL Fecal Coliform Loading (counts/days)	% Reduction
01/20/2016	80	7.31	102.9	13.42	2.21E+10		
01/26/2016	140	10.91			5.78E+10		
02/03/2016	20	22.03			1.67E+10		
02/09/2016	500	8.92			1.69E+11		
05/18/2016	16000	6.16	1816.2	4.89			
05/26/2016	800	4.58					
06/09/2016	500	3.93					
06/13/2016	1700	3.29					
08/25/2016	3000	1.86	4689.5	1.50			
08/29/2016	2800	1.51					
09/02/2016	30000	1.51					
09/06/2016	3000	1.40					
09/08/2016	3000	1.22					
12/01/2016	**160000**	3.34	20172.7	3.04	2.03E+13	5.06E+11	97.5%
12/05/2016	90000	3.93			1.34E+13		
12/20/2016	2300	1.86			1.62E+11		
12/28/2016	5000	1.91			3.61E+11		

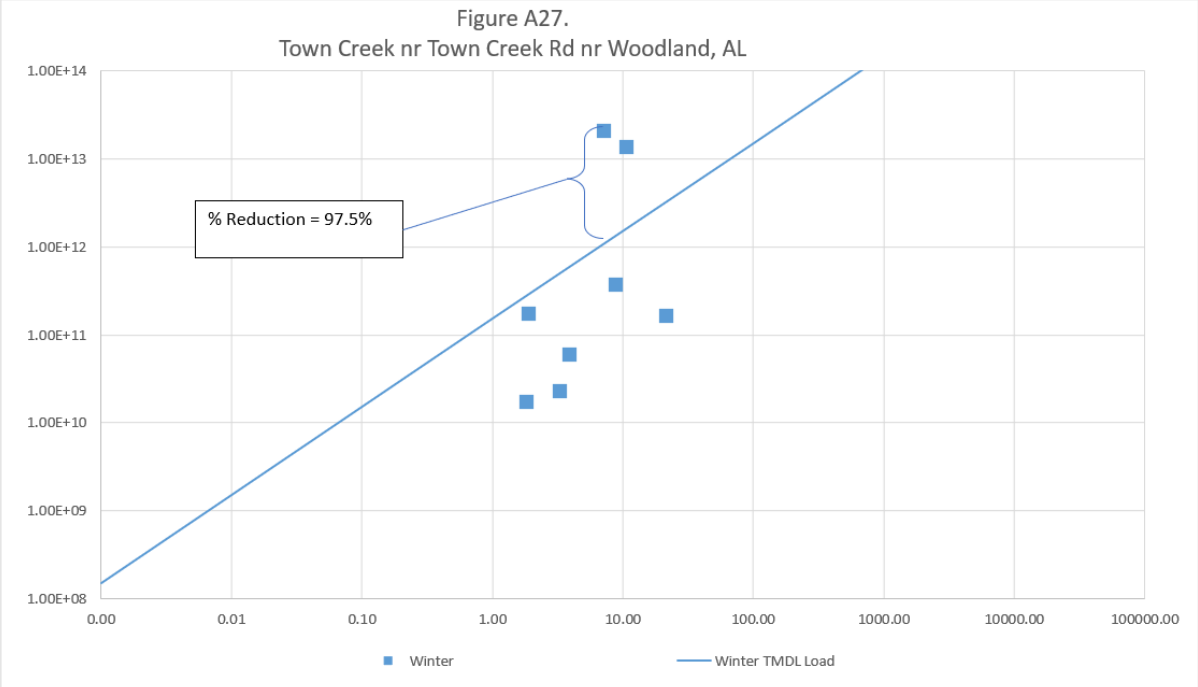

Table A28. Town Creek nr Town Creek Rd nr Woodland, AL

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Winter Single Sample Max Current Fecal Coliform Loading (counts/days)	Winter Single Sample Max TMDL Fecal Coliform Loading (counts/days)	% Reduction
01/20/2016	80	18.29	102.9	30.78	5.54E+10		
01/26/2016	140	27.32			1.45E+11		
02/03/2016	20	55.16			4.18E+10		
02/09/2016	500	22.33			4.23E+11		
05/18/2016	16000	15.42	1816.2	11.24			
05/26/2016	800	11.46					
06/09/2016	500	9.84					
06/13/2016	1700	8.23					
08/25/2016	3000	4.66	4689.5	4.07			
08/29/2016	2800	3.78					
09/02/2016	30000	3.77					
09/06/2016	3000	3.50					
09/08/2016	3000	3.06					
12/01/2016	**160000**	8.37	20172.7	6.91	5.07E+13	1.27E+12	97.5%
12/05/2016	90000	9.84			3.35E+13		
12/20/2016	2300	4.65			4.05E+11		
12/28/2016	5000	4.78			9.05E+11		

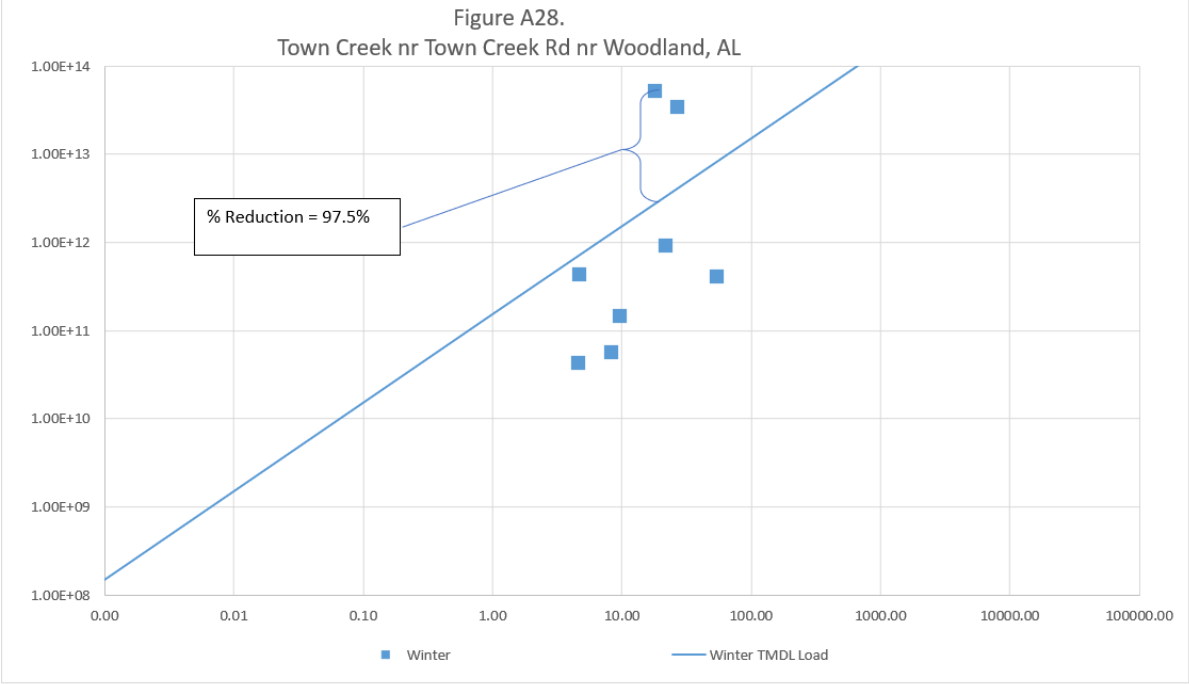

Table A29. Trib to Bull Creek

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
6/5/2018	1225	2.348	998.3	1.486	5.61E+10		
6/6/2018	658	1.867					
6/20/2018	2200	0.939					
6/21/2018	560	0.789					
8/27/2018	955	0.426	1256.7	0.404	1.92E+10		
8/28/2018	811	0.418					
9/10/2018	2400	0.389					
9/11/2018	1342	0.385					
11/19/2018	2900	2.087	807.5	1.587	4.85E+10		
11/28/2018	946	1.387					
12/5/2018	500	1.500					
12/6/2018	310	1.372					
5/1/2019	631	0.924	680.0	0.874	2.25E+10		
5/2/2019	937	0.877					
5/21/2019	882	0.891					
5/22/2019	410	0.803					
7/29/2019	3600	0.488	1575.7		0.00E+00	0.00E+00	87.3%
7/30/2019	1171	0.481					
8/19/2019	928	0.429					
11/4/2019	2800	0.675	1104.9	0.854	3.57E+10		
11/5/2019	568	0.653					
11/19/2019	703	1.123					
11/20/2019	1333	0.965					
1/7/2020	380	2.865	926.7	2.580	9.05E+10		
1/8/2020	2100	2.440					
1/22/2020	330	3.016					
2/4/2020	2800	1.999					
8/19/2020	973	0.415	594.9	0.503	1.13E+10		
8/20/2020	500	0.745					
9/8/2020	2200	0.440					
9/9/2020	117	0.411					
3/8/2021	520	1.548	522.1	1.814	3.59E+10		
3/10/2021	440	1.456					
4/5/2021	755	2.209					
4/6/2021	430	2.043					

Figure A29.
Trib to Bull Creek

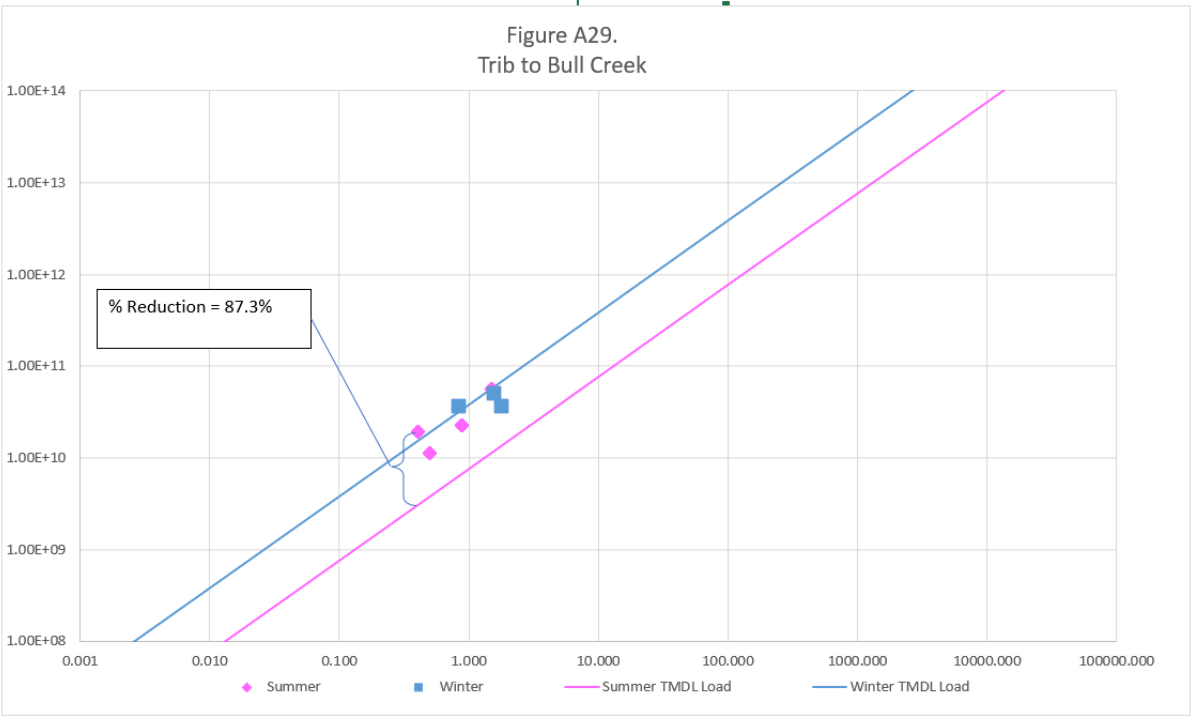

Table A30. Trib to Cemochechobee Creek at Coleman Rd. near Fort Gaines, Ga.

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
01/03/2017	1700	33.49	332.6	15.32	1.93E+11		
01/11/2017	60	3.39					
01/17/2017	40	2.42					
01/23/2017	3000	21.98					
04/10/2017	130	3.07	119.6	2.10	9.51E+09		
04/17/2017	110	1.78					
04/20/2017	130	1.53					
04/25/2017	110	2.03					
07/10/2017	500	2.17	290.8	2.63	2.89E+10	1.99E+10	31.2%
07/12/2017	500	2.16					
07/17/2017	220	3.99					
07/25/2017	130	2.19					
10/02/2017	20	0.86	228.0	1.40	1.21E+10		
10/10/2017	130	2.42					
10/16/2017	130	1.07					
10/23/2017	8000	1.27					

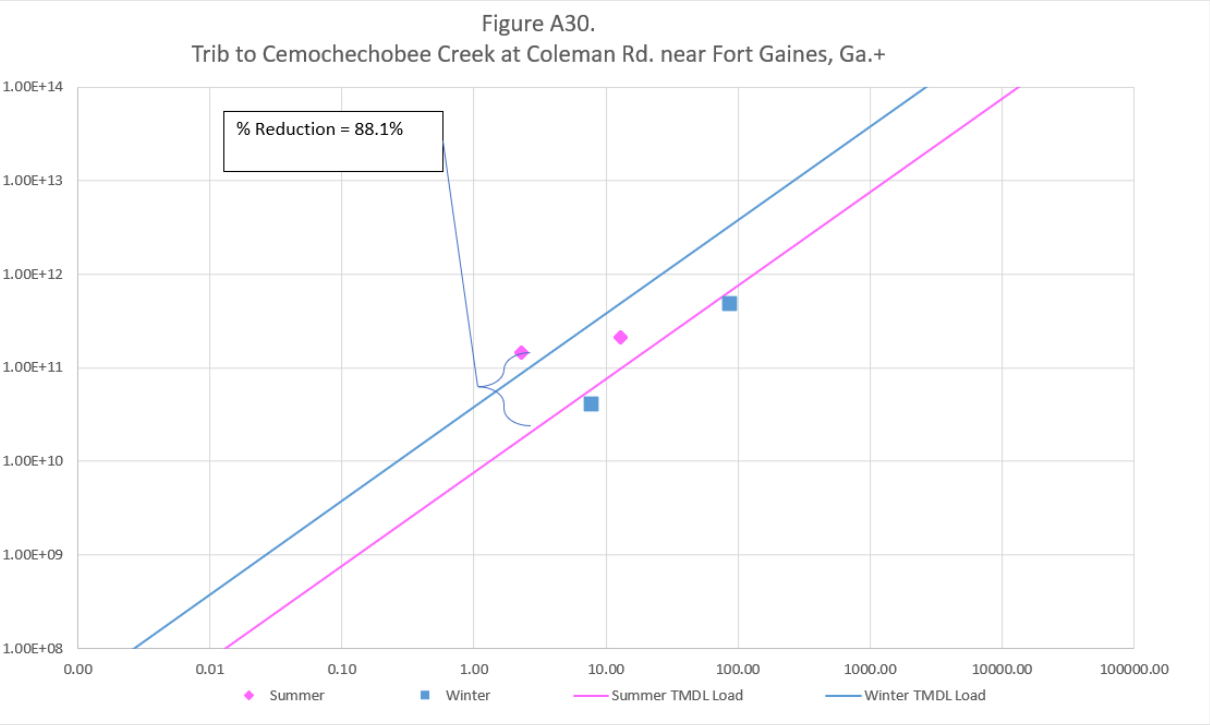

Table A31. Trib to Lick Log Creek at Nebo Rd near Hiram, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
01/19/2021	20	0.80	91.6	1.93	6.68E+09		
01/27/2021	1100	3.34					
02/03/2021	80	1.23					
02/15/2021	40	2.34					
04/05/2021	170	1.52	118.4	1.06	4.75E+09		
04/08/2021	170	1.15					
04/19/2021	40	0.69					
04/28/2021	170	0.87					
07/22/2021	1700	2.57	194.4	1.36	9.97E+09	1.03E+09	
07/26/2021	300	0.70					
08/03/2021	140	0.35					
08/12/2021	20	1.80					

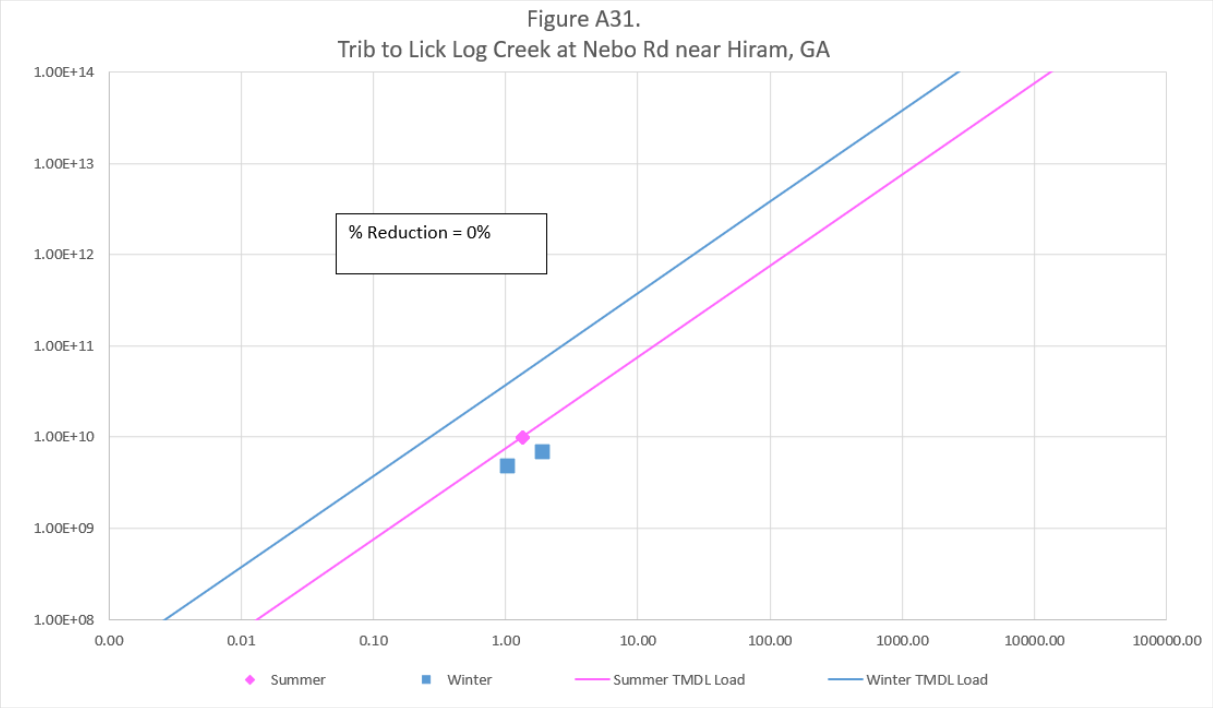

Table A32. Trib to Mountain Creek at Callaway Gardens near Pine Mountain, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
03/20/2018	2300	2.07	244.9	1.42	1.32E+10		
03/27/2018	340	1.15					
04/02/2018	230	1.28					
04/05/2018	20	1.19					
08/02/2018	1700	3.69	1384.3	1.32	6.91E+10	9.98E+09	85.6%
08/13/2018	300	0.56					
08/22/2018	300	0.61					
08/30/2018	24000	0.41					
10/01/2018	400	0.36	254.8	0.53	5.08E+09		
10/18/2018	270	0.81					
10/22/2018	300	0.47					
10/29/2018	130	0.47					
12/03/2018	300	4.49	716.8	2.46	6.67E+10		
12/06/2018	500	1.50					
12/17/2018	800	2.20					
12/20/2018	2200	1.64					

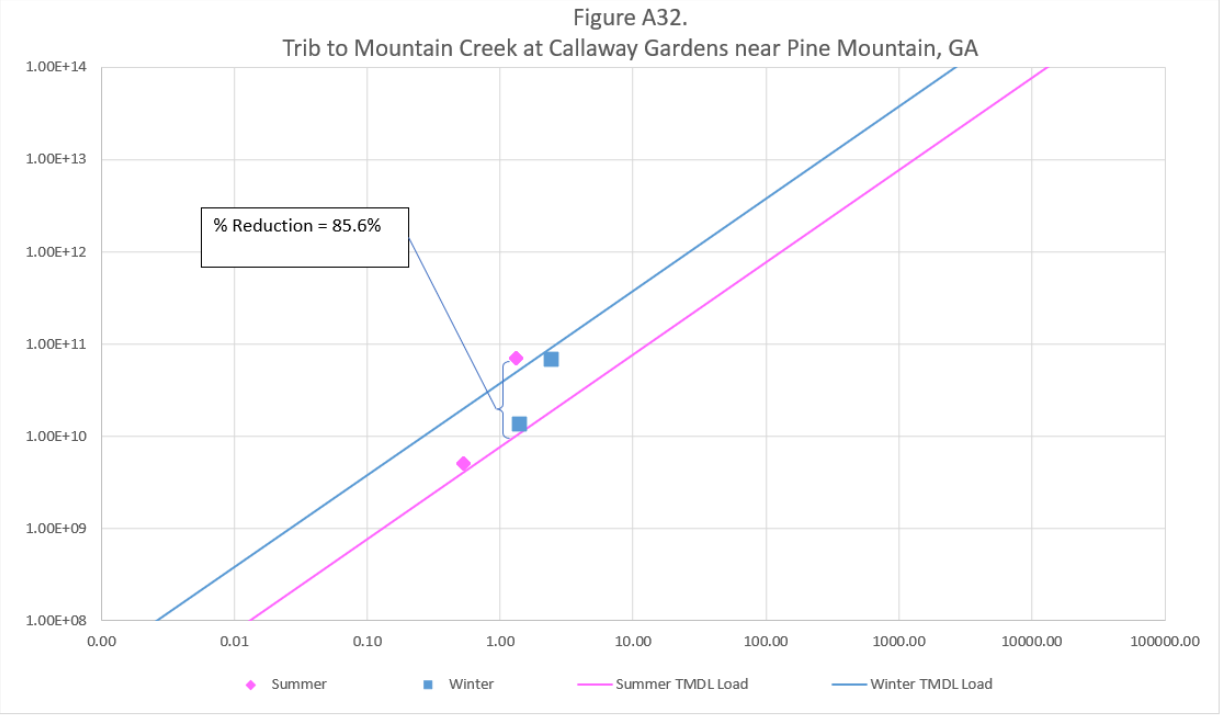

Table A33. Trib to Mulberry Creek at Oakview Street near Waverly Hall, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
03/27/2019	300	0.09	215.1	0.09	7.18E+08		
04/08/2019	170	0.09					
04/11/2019	300	0.10					
04/23/2019	140	0.07					
07/25/2019	900	0.04	953.9	0.03	1.03E+09	2.16E+08	79.0%
07/30/2019	8000	0.02					
08/01/2019	230	0.02					
08/07/2019	500	0.03					
09/16/2019	500	0.02	522.9	0.02	3.45E+08		
09/18/2019	1300	0.02					
10/01/2019	230	0.02					
10/09/2019	500	0.02					
11/21/2019	110	0.04	436.1	0.10	1.61E+09		
12/10/2019	2300	0.03					
12/12/2019	110	0.04					
12/17/2019	1300	0.28					

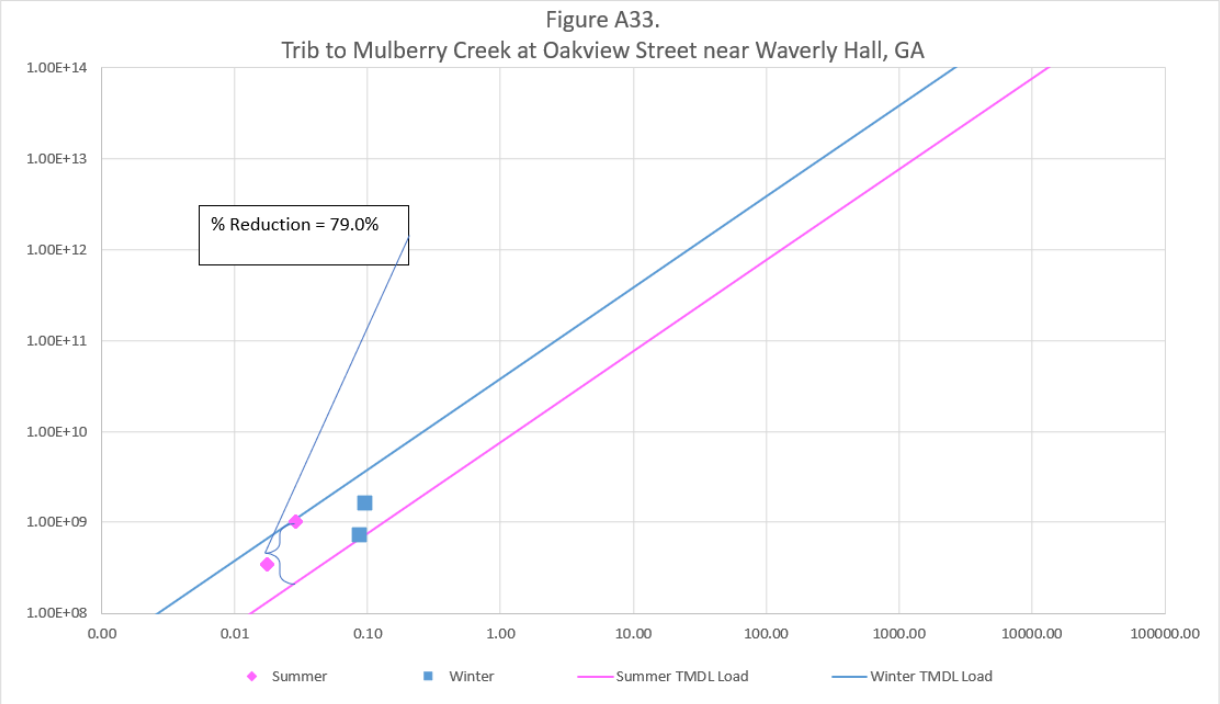

Table A34. Trib to Mulberry Creek on Oakview St near intersection with Pond Street, Waverly Hall, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
03/27/2019	60	3.60	99.8	3.51	1.33E+10		
04/08/2019	230	3.62					
04/11/2019	90	3.95					
04/23/2019	80	2.88					
07/17/2019	230	1.21	499.4	1.15	2.18E+10	8.73E+09	59.9%
07/25/2019	3000	1.52					
07/30/2019	300	0.89					
08/01/2019	300	0.87					
08/07/2019	500	1.27					
09/16/2019	140	0.69	209.5	0.69	5.51E+09		
09/18/2019	230	0.67					
10/01/2019	130	0.70					
10/09/2019	460	0.72					
11/21/2019	2300	1.59	533.4	3.90	7.87E+10		
12/10/2019	220	1.38					
12/12/2019	20	1.65					
12/17/2019	8000	10.97					

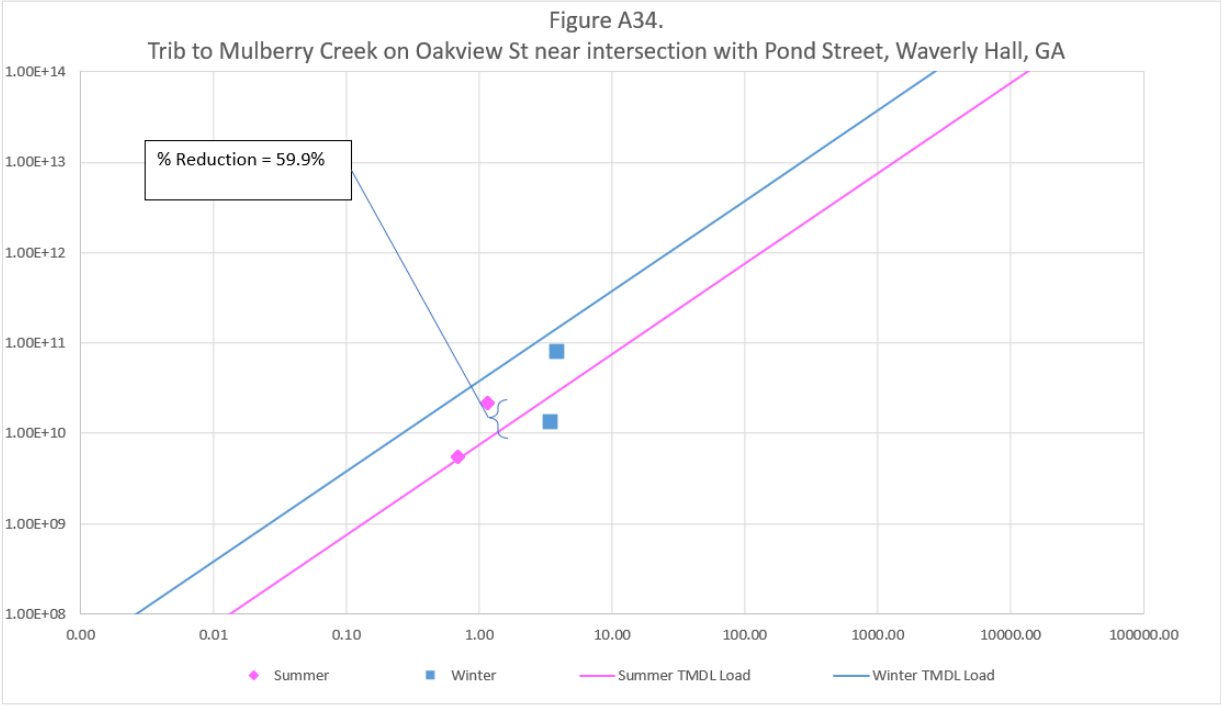

Table A35. White Sulfur Creek at Hubert Russell Rd near Greenville, GA

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
03/20/2018	2300	44.58	242.1948239	30.58	2.80E+11		
03/27/2018	110	24.65					
04/02/2018	80	27.45					
04/05/2018	170	25.64					
08/02/2018	800	79.26	779.7097961	28.34	8.36E+11	2.15E+11	74.3%
08/13/2018	3000	12.01					
08/22/2018	220	13.17					
08/30/2018	700	8.92					
10/01/2018	230	7.75	411.774513	11.33	1.77E+11		
10/18/2018	500	17.48					
10/22/2018	500	9.99					
10/29/2018	500	10.08					
12/03/2018	230	96.45	213.0634532	52.82	4.26E+11		
12/06/2018	80	32.35					
12/17/2018	70	47.21					
12/20/2018	1600	35.26					

Figure A35.
White Sulfur Creek at Hubert Russell Rd near Greenville, GA

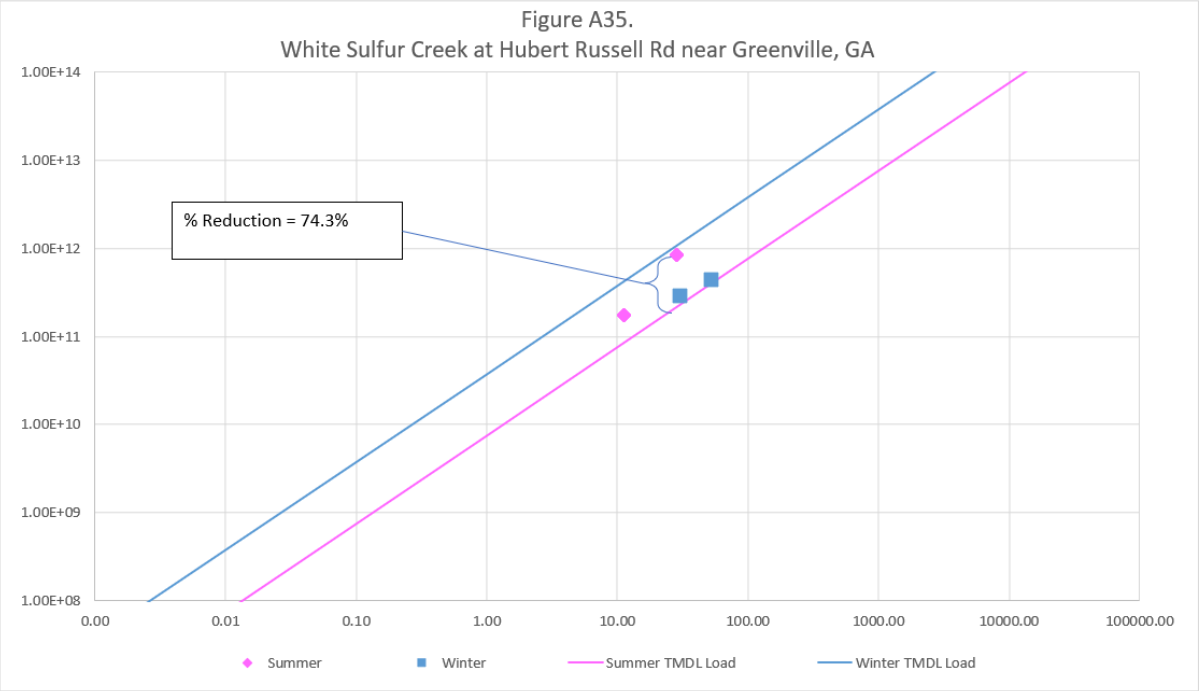

Table A36. Whitewater Creek at North Glenn Rd

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
01/20/2016	20	16.46	79.52707288	27.69	8.34E+10		
01/26/2016	20	24.58					
02/03/2016	5000	49.63					
02/09/2016	20	20.09					
05/18/2016	130	13.88	119.3347665	10.11	4.57E+10		
05/26/2016	40	10.31					
06/09/2016	130	8.86					
06/13/2016	300	7.40					
08/25/2016	500	4.19	552.9716964	3.37	7.06E+10	2.55E+10	63.8%
08/29/2016	500	3.40					
09/06/2016	1700	3.15					
09/08/2016	220	2.75					
12/01/2016	1100	7.53	242.0398192	6.22	5.70E+10		
12/05/2016	300	8.86					
12/20/2016	80	4.18					
12/28/2016	130	4.30					

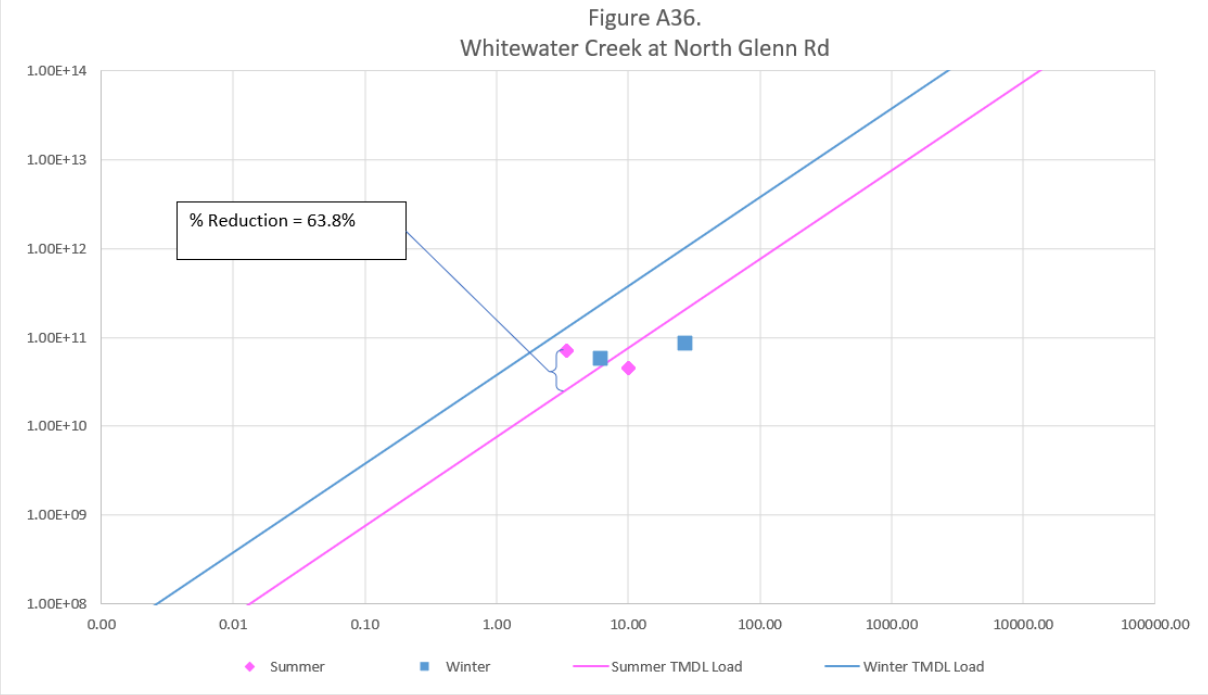

Table A37. Whitewater Creek at North Glenn Rd

Date	Observed Fecal coliform (Count/100 mL)	Estimated Instantaneous Flow on Sample Day (cfs)	Geometric Mean (counts/100 mL)	Mean Flow (cfs)	Geometric Mean Current Fecal Coliform Loading (counts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (counts/30 days)	% Reduction
01/20/2016	20	32.71	79.52707288	55.04	1.66E+11		
01/26/2016	20	48.87					
02/03/2016	5000	98.66					
02/09/2016	20	39.94					
05/18/2016	130	27.59	119.3347665	20.10	9.08E+10		
05/26/2016	40	20.49					
06/09/2016	130	17.60					
06/13/2016	300	14.71					
08/25/2016	500	8.33	552.9716964	6.71	1.40E+11	5.08E+10	63.8%
08/29/2016	500	6.77					
09/06/2016	1700	6.27					
09/08/2016	220	5.46					
12/01/2016	1100	14.98	242.0398192	12.36	1.13E+11		
12/05/2016	300	17.60					
12/20/2016	80	8.32					
12/28/2016	130	8.55