FINAL
Total Maximum Daily Load (TMDL)
for

Harris Creek
Assessment Unit ID # AL06030006-0201-900

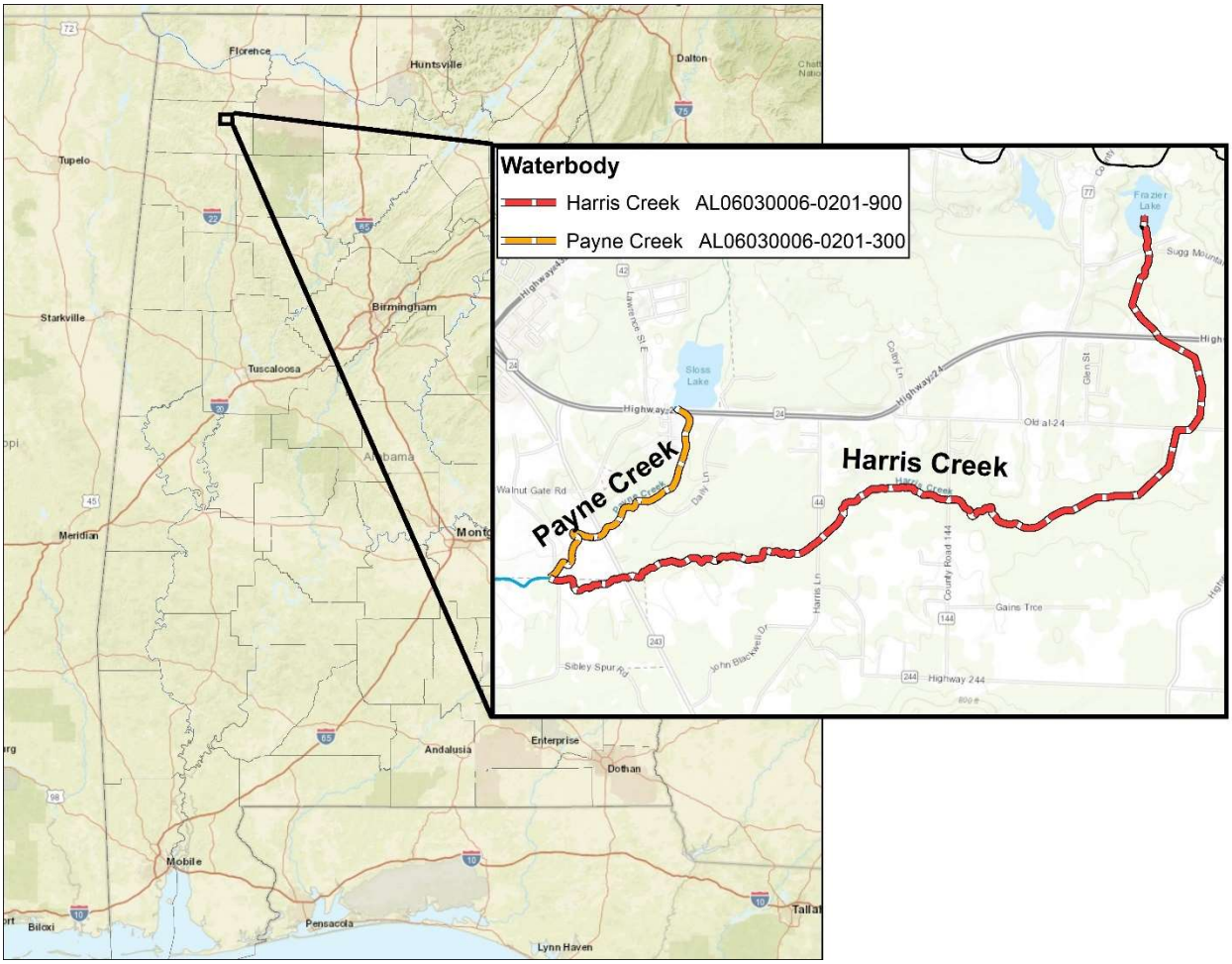
Payne Creek
Assessment Unit ID # AL06030006-0201-300

Franklin County

Pathogens (*E. coli*)

Alabama Department of Environmental Management
Water Quality Branch
Water Division
August 2024

Figure 1: Payne Creek and Harris Creek



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1.0 Executive Summary

Section 303(d) of the Clean Water Act and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) require states to identify waterbodies which are not meeting their designated uses and to determine the total maximum daily load (TMDL) for pollutants causing the use impairment. A TMDL is the sum of individual waste load allocations (WLAs) for point sources, load allocations (LAs) for nonpoint sources including natural background levels, and a margin of safety (MOS).

Harris Creek, located in Franklin County, is a tributary to Mud Creek. Harris Creek is currently included on Alabama's §303(d) list as impaired for pathogens (*E. coli*) from Mud Creek to its source. The listed portion of Harris Creek has a designated use classification of Fish and Wildlife (F&W). Harris Creek flows west for a total length of 5.99 miles, ending at the confluence with Payne Creek to form Mud Creek. The total drainage area for the Harris Creek watershed is approximately 9.91 square miles.

Harris Creek was placed on Alabama's 2018 §303(d) list for pathogens (*E. coli*) based upon water quality data collected during 2014. An evaluation of the available monthly water quality samples indicated that Harris Creek was not meeting the pathogen criteria applicable to its use classification (F&W). During 2017-2018 and 2023, additional *E. coli* sampling was conducted to collect the necessary data to evaluate the impaired segment. The results of this sampling will be utilized in this TMDL.

Payne Creek, located in Franklin County, is also a tributary to Mud Creek. Payne Creek is currently included on Alabama's §303(d) list as impaired for pathogens (*E. coli*) from Mud Creek to Sloss Lake. The listed portion of Payne Creek has a designated use classification of F&W. The listed segment of Payne Creek flows southwest for a total length of 1.61 miles, ending at the confluence with Harris Creek to form Mud Creek. The total drainage area for the Payne Creek watershed is approximately 8.73 square miles.

Payne Creek was placed on Alabama's 2020 §303(d) list for pathogens (*E. coli*) based upon water quality data collected during 2018. An evaluation of the available monthly water quality samples indicated Payne Creek was not meeting the pathogen criteria applicable to its use classification (F&W). In 2023, an intensive *E. coli* study was performed to collect additional data to evaluate the impaired segment. The results of the 2018 and 2023 *E.coli* sampling will be utilized in this TMDL.

A mass balance approach was used for calculating the pathogen TMDLs for both Harris Creek and Payne Creek. The mass balance approach utilizes the conservation of mass principle. Existing loads were calculated by multiplying the *E. coli* concentrations times the respective in-stream flows and a conversion factor. In the same manner as existing loads were calculated, allowable loads were calculated for the single sample *E. coli* target of 268.2 colonies/100 mL (298 colonies/100mL-10% Margin of Safety) and geometric mean *E. coli* target of 113.4 colonies/100 ml (126 colonies/100 ml – 10% Margin of Safety). The TMDL was calculated using the single sample or geometric mean sample exceedance event which resulted in the highest percent reduction.

Table 1.1 is a summary of the estimated existing load, allowable load, and percent reduction for the single sample criterion and the geometric mean criterion for Harris Creek. Table 1.2 lists the TMDL, defined as the maximum allowable *E. coli* loading under critical conditions, for Harris Creek.

Table 1.1: Harris Creek - *E. coli* Loads and Required Reductions

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	6.95E+11	5.38E+10	6.41E+11	92%
Geometric Mean Load	2.05E+11	1.81E+10	1.87E+11	91%

Table 1.2: *E. coli* TMDL for Harris Creek

TMDL[f]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[a]			Load Allocation (LA)	
		WWTPs[b]	Stormwater (MS4s[c] and other NPDES sources[d])	Leaking Collection Systems[e]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
5.98E+10	5.98E+09	N/A	92%	0	5.38E+10	92%

Note: NA = not applicable

a. There are currently no CAFOs in the Harris Creek watershed. Future CAFOs will be assigned a waste load allocation (WLA) of zero.

b. There are currently no WWTPs in the Harris Creek watershed. Future WWTPs must meet the applicable in-stream water quality criteria for pathogens at the point of discharge.

c. There are currently no MS4 areas in the Harris Creek watershed. Future MS4 areas will demonstrate consistency with the requirements of this TMDL through implementation and maintenance of BMPs on a case-by-case basis.

d. Other NPDES-permitted stormwater sources will demonstrate consistency with the requirements of this TMDL through implementation and maintenance of BMPs on a case-by-case basis. The percent reduction should not be interpreted as a numeric permit limitation.

e. The objective for leaking collection systems is a WLA of zero. It is recognized, however, that a WLA of 0 colonies/day may not be practical. For these sources, the WLA is interpreted to mean a reduction in *E. coli* loading to the maximum extent practicable, consistent with the requirement that these sources not contribute to a violation of the water quality criteria for *E. coli*.

f. TMDL was established using the single sample maximum criterion of 298 colonies/100 ml.

Table 1.3 is a summary of the estimated existing load, allowable load, and percent reduction for the single sample criterion and the geometric mean criterion for Payne Creek. Table 1.4 lists the TMDL, defined as the maximum allowable *E. coli* loading under critical conditions, for Payne Creek.

Table 1.3: Payne Creek - *E. coli* Loads and Required Reductions

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	1.94E+10	2.62E+09	1.68E+10	86%
Geometric Mean Load	8.87E+10	1.95E+10	6.93E+10	78%

Table 1.4: *E. coli* TMDL for Payne Creek

TMDL[f]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[a]			Load Allocation (LA)	
		WWTPs[b]	Stormwater (MS4s[c] and other NPDES sources[d])	Leaking Collection Systems[e]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
2.92E+9	2.92E+8	N/A	N/A	0	2.62E+9	86%

Note: NA = not applicable
a. There are currently no CAFOs in the Payne Creek watershed. Future CAFOs will be assigned a waste load allocation (WLA) of zero.
b. There are currently no WWTPs in the Payne Creek watershed. Future WWTPs must meet the applicable in-stream water quality criteria for pathogens at the point of discharge.
c. There are currently no MS4 areas in the Payne Creek watershed. Future MS4 areas will demonstrate consistency with the requirements of this TMDL through implementation and maintenance of BMPs on a case-by-case basis.
d. There are currently no NPDES-permitted stormwater sources in the Payne Creek watershed. Future NPDES-permitted stormwater sources will demonstrate consistency with the requirements of this TMDL through implementation and maintenance of BMPs on a case-by-case basis.
e. The objective for leaking collection systems is a WLA of zero. It is recognized, however, that a WLA of 0 colonies/day may not be practical. For these sources, the WLA is interpreted to mean a reduction in *E. coli* loading to the maximum extent practicable, consistent with the requirement that these sources not contribute to a violation of the water quality criteria for *E. coli*.
f. TMDL was established using the single sample maximum criterion of 298 colonies/100 ml.

Compliance with the terms and conditions of existing and future NPDES permits will effectively implement the WLA and demonstrate consistency with the assumptions and requirements of the TMDL. Required load reductions in the LA portion of this TMDL can be implemented through voluntary measures and may be eligible for CWA §319 grants.

The Department recognizes that adaptive implementation of this TMDL will be needed to achieve applicable water quality criteria, and we are committed to targeting the load reductions to improve water quality in the Harris Creek and Payne Creek watersheds. As additional data and/or information become available, it may become necessary to revise and/or modify the TMDL accordingly.

2.0 Basis for §303(d) Listing

2.1 Introduction

Section 303(d) of the Clean Water Act and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) require states to identify waterbodies which are not meeting their designated uses and to determine the total maximum daily load (TMDL) for pollutants causing use impairment. The TMDL process establishes the allowable loading of pollutants for a waterbody based on the relationship between pollution sources and in-stream water quality conditions, so that states can establish water-quality based controls to reduce pollution and restore and maintain the quality of their water resources (USEPA, 1991).

2.2 Problem Definition

Waterbody Impaired:	Harris Creek – from Mud Creek to its source
Assessment Unit ID:	AL06030006-0201-900
Impaired Reach Length:	5.99 miles
Impaired Drainage Area:	9.91 sq. miles
Water Quality Standard Violation:	Pathogens (Single Sample Maximum, Geometric Mean)
Pollutant of Concern:	Pathogens (*E. coli*)
Water Use Classification:	Fish and Wildlife

Waterbody Impaired:	Payne Creek – from Mud Creek to Sloss Lake
Assessment Unit ID:	AL06030006-0201-300
Impaired Reach Length:	1.61 miles
Impaired Drainage Area:	8.73 sq. miles
Water Quality Standard Violation:	Pathogens (Single Sample Maximum, Geometric Mean)
Pollutant of Concern:	Pathogens (*E. coli*)
Water Use Classification:	Fish and Wildlife

<u>Usage Related to Classification:</u>
The impaired stream segments are both classified as Fish and Wildlife (F&W). Usage of waters in this classification is described in ADEM Admin. Code R. 335-6-10-.09(5)(a), (b), (c), and (d).

(a) Best usage of waters: fishing, propagation of fish, aquatic life, and wildlife.

(b) Conditions related to best usage: the waters will be suitable for fish, aquatic life and wildlife propagation. The quality of salt and estuarine waters to which this classification is assigned will also be suitable for the propagation of shrimp and crabs.

(c) Other usage of waters: it is recognized that the waters may be used for incidental water contact year-round and whole body water-contact recreation during the months of May through October, except that water contact is strongly discouraged in the vicinity of discharges or other conditions beyond the control of the Department or the Alabama Department of Public Health.

(d) Conditions related to other usage: the waters, under proper sanitary supervision by the controlling health authorities, will meet accepted standards of water quality for outdoor swimming areas and will be considered satisfactory for swimming and other whole body water-contact sports.

E. coli Criteria:

Criteria for acceptable bacteria levels for the F&W use classification are described in ADEM Admin. Code R. 335-6-10-.09(5)(e)7(i) and (ii) as follows:

7. Bacteria:

(i) In non-coastal waters, bacteria of the E. coli group shall not exceed a geometric mean of 548 colonies/100 ml; nor exceed a maximum of 2,507 colonies/100 ml in any sample. In coastal waters, bacteria of the enterococci group shall not exceed a maximum of 275 colonies/100 ml in any sample. The geometric mean shall be calculated from no less than five samples collected at a given station over a 30-day period at intervals not less than 24 hours.

(ii) For incidental water contact and whole body water-contact recreation during the months of May through October, the bacterial quality of water is acceptable when a sanitary survey by the controlling health authorities reveals no source of dangerous pollution and when the geometric mean E. coli organism density does not exceed 126 colonies/100 ml nor exceed a maximum of 298 colonies/100 ml in any sample in non-coastal waters. In coastal waters, bacteria of the enterococci group shall not exceed a geometric mean of 35 colonies/100 ml nor exceed a maximum of 158 colonies/100 ml in any sample. The geometric mean shall be calculated from no less than five samples collected at a given station over a 30-day period at intervals not less than 24 hours. When the geometric bacterial coliform organism density exceeds these levels, the bacterial water quality shall be considered acceptable only if a second detailed sanitary survey and evaluation discloses no significant public health risk in the use of the waters. Waters in the immediate vicinity of discharges of sewage or other wastes likely to contain bacteria harmful to humans, regardless of the degree of treatment afforded these wastes, are not acceptable for swimming or other whole body water contact sports.

Harris Creek - Criteria Exceeded:

Harris Creek was placed on Alabama's 2018 §303(d) list for pathogens based upon data collected during 2014 at station HARF-1. The basis for the addition to the list was that the single sample *E. coli* criterion was exceeded in three out of eight samples. The table below illustrates the 2014 *E. coli* data for HARF-1.

Table 2.2.1: Data for §303(d) Listing- Ambient Monitoring (2014)

Station	Date_Time	Flow cfs	E. coli (MPN/DL) mpn/dl	Single Sample Max Criterion
HARF-1	4/2/2014 9:45	7.5	235.9	2507
HARF-1	5/27/2014 9:40	5.6	**517.2**	298
HARF-1	6/17/2014 10:00	13	118.7	298
HARF-1	7/17/2014 10:00	1.9	178.5	298
HARF-1	8/7/2014 9:45	1.8	**365.4**	298
HARF-1	9/10/2014 10:15	1.4	133.3	298
HARF-1	10/1/2014 10:15	0.5	**387.5**	298
HARF-1	11/4/2014 10:00	3.7	1732.9	2507

Payne Creek - Criteria Exceeded:

Payne Creek was placed on Alabama's 2020 §303(d) list for pathogens based upon data collected during 2018 at station PYCF-1. The basis for the addition to the list was that the single sample *E. coli* criterion was exceeded in four out of eight samples. The table below illustrates the 2018 *E. coli* data for PYCF-1.

Table 2.2.2: Payne Creek - Data for §303(d) Listing- Ambient Monitoring (2018)

Station	Date_Time	Flow cfs	E. coli (MPN/DL) mpn/dl	Single Sample Max Criterion
PYCF-1	3/19/2018 9:40	17.4	1119.9	2507
PYCF-1	4/10/2018 9:45	20.5	201.4	2507
PYCF-1	5/2/2018 9:50	15.4	151.5	298
PYCF-1	6/12/2018 10:00	4.8	142.1	298
PYCF-1	7/11/2018 9:45	2	**980.4**	298
PYCF-1	8/7/2018 11:45		**325.5**	298
PYCF-1	9/12/2018 10:00	0.4	**1986.3**	298
PYCF-1	10/10/2018 9:50	0.6	**980.4**	298

3.0 Technical Basis for TMDL Development

3.1 Water Quality Target Identification

For the purpose of this TMDL, a single sample maximum *E. coli* target of 268.2 colonies/100 ml will be used. This target was derived by using a 10% explicit margin of safety from the single sample maximum criterion of 298 colonies/100 ml. This target is considered protective of water quality standards and should not allow the single sample maximum criterion to be exceeded. In addition, a geometric mean target of 113.4 colonies/100 ml will be used for a series of five samples taken at least 24 hours apart over the course of 30 days. This target was also derived by using a 10% explicit margin of safety from the geometric mean criterion of 126 colonies/100 ml. This target is considered protective of water quality standards and should not allow the geometric mean criterion to be exceeded.

3.2 Source Assessment

A point source can be defined as a discernible, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters. Point source contributions can typically be attributed to municipal wastewater facilities, illicit discharges, and leaking sewer systems in urban areas. Municipal wastewater treatment facilities are permitted through the National Pollutant Discharge Elimination System (NPDES) process administered by ADEM. In urban settings, sewer lines typically run parallel to streams in the floodplain. If a leaking sewer line is present, high concentrations of bacteria can flow into the stream or leach into the groundwater. Illicit discharges are found at facilities that are discharging bacteria when not permitted, or when the pathogens criterion established in the issued NPDES permit is not being upheld.

3.2.1 Continuous Point Sources

Pilgrims Pride Corporation operates a poultry processing facility (NPDES permit number AL0060470) within the Harris Creek watershed. The facility processes live poultry into consumer products. Wastewater that is generated from poultry processing operations includes process and sanitary wastewaters, vehicle wash water, and off-site feed mill hatchery wastewaters. Currently, all process wastewaters are discharged via land application to nearby sprayfields located adjacent to the facility within the watershed. Since the facility is not permitted to discharge treated wastewater to a surface water, it will not be given an allocation in this TMDL.

Currently, there are no NPDES-regulated continuous point source discharges located within the Payne Creek watershed.

3.2.2 Non-Continuous Point Sources

The Pilgrims Pride Corporation facility noted above is also permitted through the NPDES program to discharge storm water runoff to Harris Creek. The current permit requires the facility to monitor for *E. coli* in their storm water runoff. Pilgrims Pride Corporation will be required to comply with the provisions of this TMDL through implementation of Best Management Practices (BMPs).

There are currently five other NPDES storm water discharge permits within the Harris Creek watershed. These facilities, listed below in table 3.2.2.1, are not required to monitor for *E. coli* under their current NPDES permits and are not considered to be a source of pathogens due to the nature of their processes. Therefore, no *E. coli* loading to the Harris Creek watershed will be attributed to these facilities, and they will not receive an allocation in this TMDL.

Table 3.2.2.1: NPDES Facilities in Harris Creek watershed

Permit Number	Facility Name	Type of Operation
ALG020185	Rogers Group, Inc. - Russellville Asphalt	Asphalt
ALG060494	Southern Energy Homes, Inc. dba Russellville	Lumber and Wood
ALG110072	CEMEX - Ready Mix USA, LLC: Russellville - 5141	Concrete
ALG120840	Southeastern Commercial Fabricators LLC	Metals
AL0072117	South Russellville Quarry	Mining

There are currently five NPDES storm water discharge permits within the Payne Creek watershed. These facilities, listed below in table 3.2.2.2, are not required to monitor for *E. coli* under their current NPDES permits and are not considered to be a source of pathogens due to the nature of their processes. Therefore, no *E. coli* loading to the Payne Creek watershed will be attributed to these facilities, and they will not receive an allocation in this TMDL.

Table 3.2.2.2: NPDES Facilities in Payne Creek watershed

Permit Number	Facility Name	Type of Operation
ALG110072	CEMEX - Ready Mix USA, LLC: Russellville - 5141	Concrete
ALG120108	G&G Steel, Inc.	Metals
ALG120258	B&B Roadway	Metals
ALG120769	Leisure Creations	Metals
ALG120837	Innovative Hearth Products, LLC (IHP)	Metals

3.2.3 Municipal Separate Storm Sewer Systems (MS4s)

Currently, there are no urban areas designated as Municipal Separate Storm Sewer System (MS4) regulated areas located within the Harris Creek watershed or the Payne Creek watershed.

3.2.4 Animal Feeding Operation/Concentrated Animal Feeding Operation (AFO/CAFO)

Currently, there are no Animal Feeding Operations/Concentrated Animal Feeding Operations (AFOs/CAFOs) located within the Harris Creek watershed or the Payne Creek watershed. The Department's AFO/CAFO regulations prohibit the discharge of pollutants from the facilities and their associated waste land application activities. As a result, future AFOs/CAFOs will receive a waste load allocation of zero.

Any future NPDES regulated discharger that is considered by the Department to be a pathogen source will be required to demonstrate consistency with the assumptions and requirements of this TMDL.

3.2.5 Sanitary Sewer Overflows (SSOs)

Sanitary sewer overflows (SSOs) have the potential to severely impact water quality and can often result in the violation of water quality standards. It is the responsibility of the NPDES wastewater discharger or collection system operator for non-permitted "collection only" systems to ensure that releases do not occur. Unfortunately, releases to surface waters from SSOs are not always preventable or reported.

From a review of the Department's Alabama Environmental Permitting and Compliance System (AEPACS) database, it was found that numerous SSOs have been reported in the Payne Creek watershed in recent years. During 2018-2024, there were sixteen SSOs related to the Radford "Joe" Murray WWTP in the Payne Creek watershed. Further details of the SSOs in the watershed are included in Appendix 7.2.

3.2.6 Nonpoint Sources

Nonpoint sources of bacteria do not have a defined discharge point, but rather occur over the entire length of a stream or waterbody. On the land surface, bacteria can accumulate over time and be washed into streams or waterbodies during rain events. Therefore, there is some net loading of bacteria into streams as dictated by the watershed hydrology.

Agricultural land can be a source of *E. coli* bacteria. Stormwater runoff from pastures and animal feeding areas can be a source of *E. coli*. In addition, improper land application of animal wastes and animals with direct access to streams are mechanisms that can contribute bacteria to waterbodies. To account for the potential influence from animals with direct access to stream reaches in the watershed, *E. coli* loads can be calculated as a direct source into the stream.

E. coli bacteria can also originate from forested areas due to the presence of wild animals such as deer, raccoons, turkey, waterfowl, etc. Wildlife will deposit feces onto land surfaces, where it can be transported during rainfall events to nearby streams. Control of these sources is usually limited to land management BMPs and may be impracticable in most cases. As a result, forested areas are not specifically targeted in this TMDL.

E. coli loading from developed areas is potentially attributable to multiple sources including stormwater runoff, unpermitted discharges of wastewater, runoff from improper disposal of waste materials, failing septic tanks, sewer overflows, and domestic animals. On-site septic systems may be direct or indirect sources of bacterial pollution via ground and surface waters due to system failures and malfunctions.

The nature and extent of bacteria sources in the watershed will be identified more specifically during the implementation phase of the TMDL.

3.3 Land Use Assessment

Land use percentages for the Harris Creek watershed were determined from the 2021 National Land Cover Dataset (NLCD). The total drainage area of the Harris Creek watershed is approximately 9.91 square miles. Table 3.3.1 lists the various land uses and their associated percentages for the Harris Creek watershed. A pie chart illustrating the major cumulative land use types for the Harris Creek watershed is shown in Figure 3.3.1.

Table 3.3.1: Harris Creek Watershed Land Use (2021 NLCD)

2021 NLCD Land Cover	NLCD Legend	Area (square miles)	%
Open Water	11	0.14	1.43%
Developed, Open Space	21	0.44	4.44%
Developed, Low Intensity	22	0.30	3.07%
Developed, Medium Intensity	23	0.14	1.41%
Developed, High Intensity	24	0.07	0.69%
Barren Land	31	0.17	1.71%
Deciduous Forest	41	1.72	17.33%
Evergreen Forest	42	0.57	5.73%
Mixed Forest	43	0.50	5.02%
Shrub/Scrub	52	0.14	1.44%
Herbaceuous	71	0.13	1.33%
Hay/Pasture	81	4.45	44.91%
Cultivated Crops	82	0.96	9.66%
Woody Wetlands	90	0.17	1.74%
Emergent Herbaceuous Wetlands	95	0.01	0.08%

Cumalative Land Cover	NLCD Legend	Area (square miles)	%
Open Water	11	0.14	1.43%
Developed	21,22,23,24	0.95	9.61%
Barren Land	31	0.17	1.71%
Forested	41,42,43	2.78	28.08%
Grassland/Shrub	52,71	0.27	2.77%
Agriculture	81,82	5.41	54.57%
Wetlands	90,95	0.18	1.83%

Figure 3.3.1: Harris Creek Watershed Cumulative Land Use Distribution

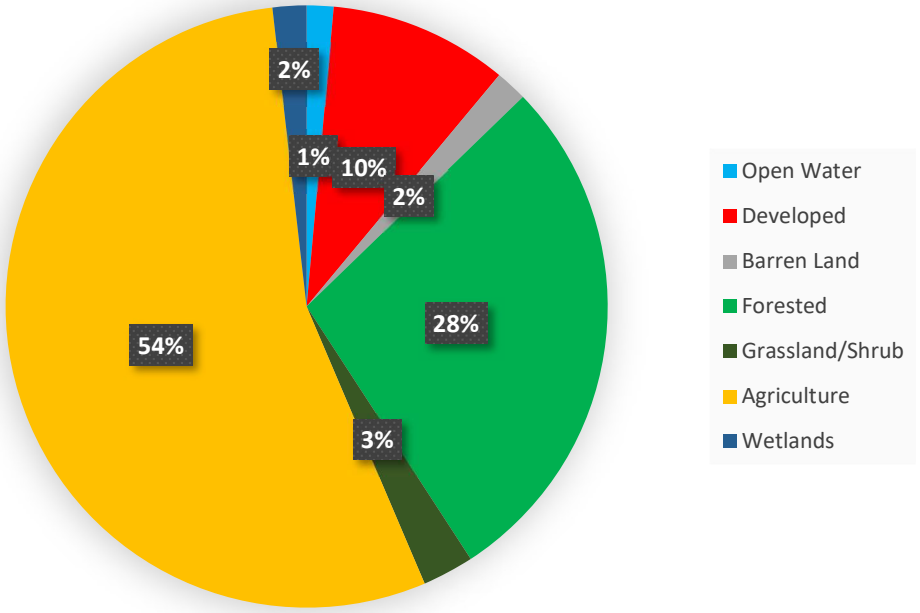
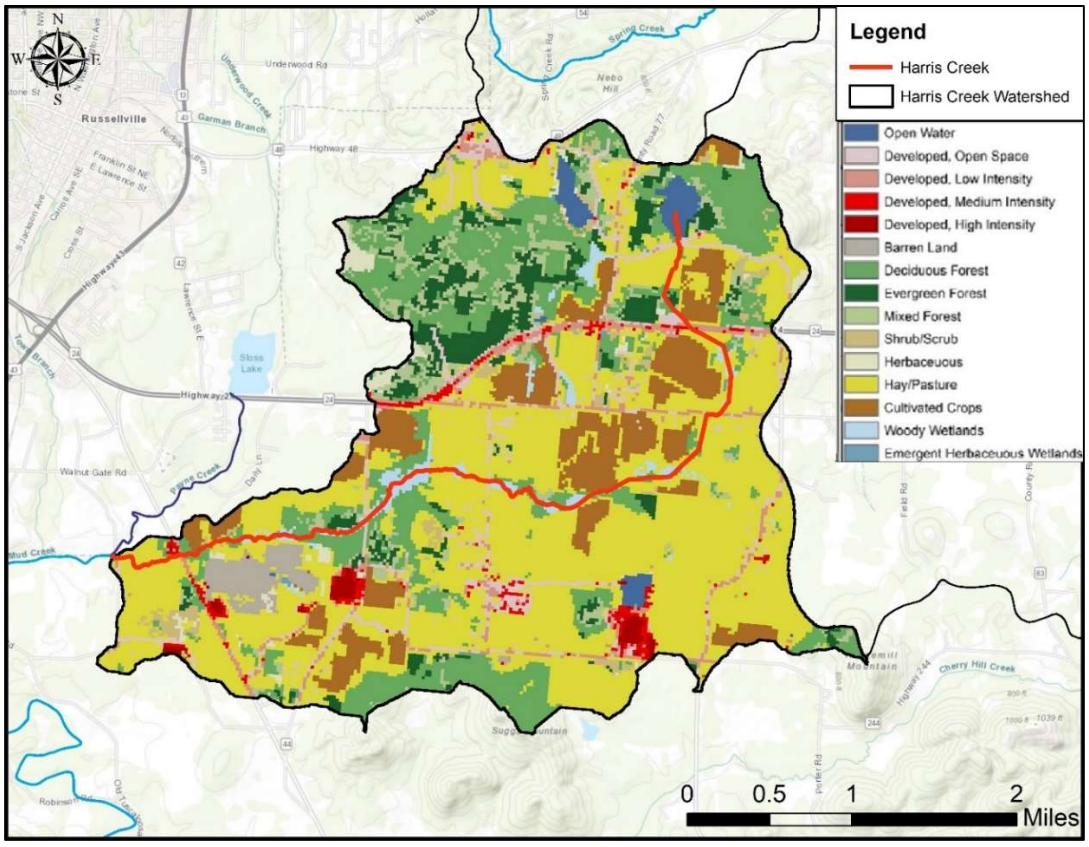


Figure 3.3.2: 2021 NLCD Map of the Harris Creek Watershed



Land use percentages for the Payne Creek watershed were also determined from the 2021 NLCD. The total drainage area of the Payne Creek watershed is approximately 8.73 square miles. Table 3.3.2 lists the various land uses and their associated percentages for the Payne Creek watershed. A pie chart illustrating the major cumulative land use types for the Payne Creek watershed is shown in Figure 3.3.3.

Table 3.3.2: Payne Creek Watershed Land Use (2021 NLCD)

2021 NLCD Land Cover	NLCD Legend	Area (square miles)	%
Open Water	11	0.11	1.31%
Developed, Open Space	21	0.97	11.06%
Developed, Low Intensity	22	1.05	12.05%
Developed, Medium Intensity	23	0.51	5.86%
Developed, High Intensity	24	0.17	1.96%
Barren Land	31	0.00	0.01%
Deciduous Forest	41	2.09	23.93%
Evergreen Forest	42	0.47	5.41%
Mixed Forest	43	0.60	6.83%
Shrub/Scrub	52	0.07	0.78%
Herbaceuous	71	0.23	2.65%
Hay/Pasture	81	1.91	21.80%
Cultivated Crops	82	0.17	2.00%
Woody Wetlands	90	0.37	4.19%
Emergent Herbaceuous Wetlands	95	0.01	0.17%

Cumalative Land Cover	NLCD Legend	Area (square miles)	%
Open Water	11	0.11	1.31%
Developed	21,22,23,24	2.70	30.93%
Barren Land	31	0.00	0.01%
Forested	41,42,43	3.16	36.16%
Grassland/Shrub	52,71	0.30	3.43%
Agriculture	81,82	2.08	23.80%
Wetlands	90,95	0.38	4.36%

Figure 3.3.3: Payne Creek Watershed Cumulative Land Use Distribution

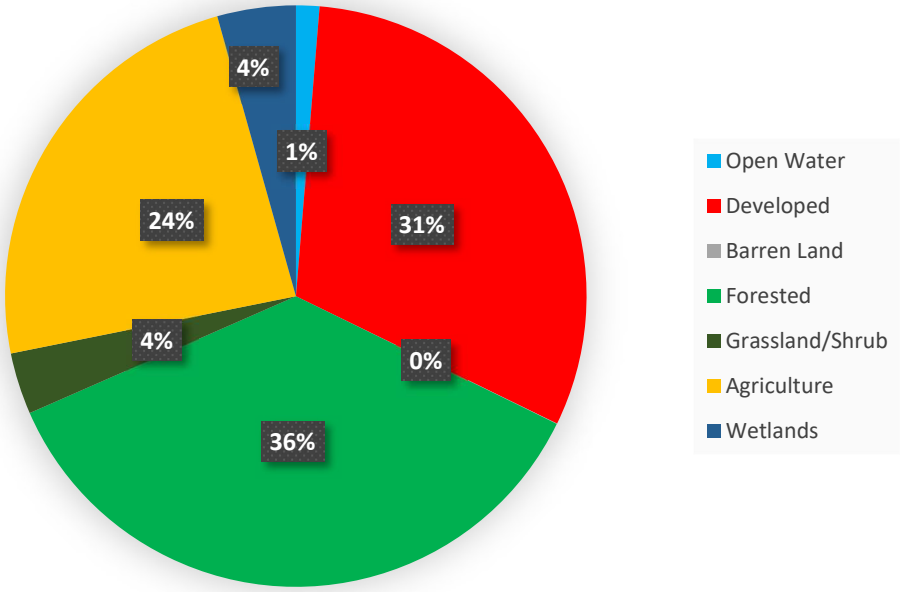
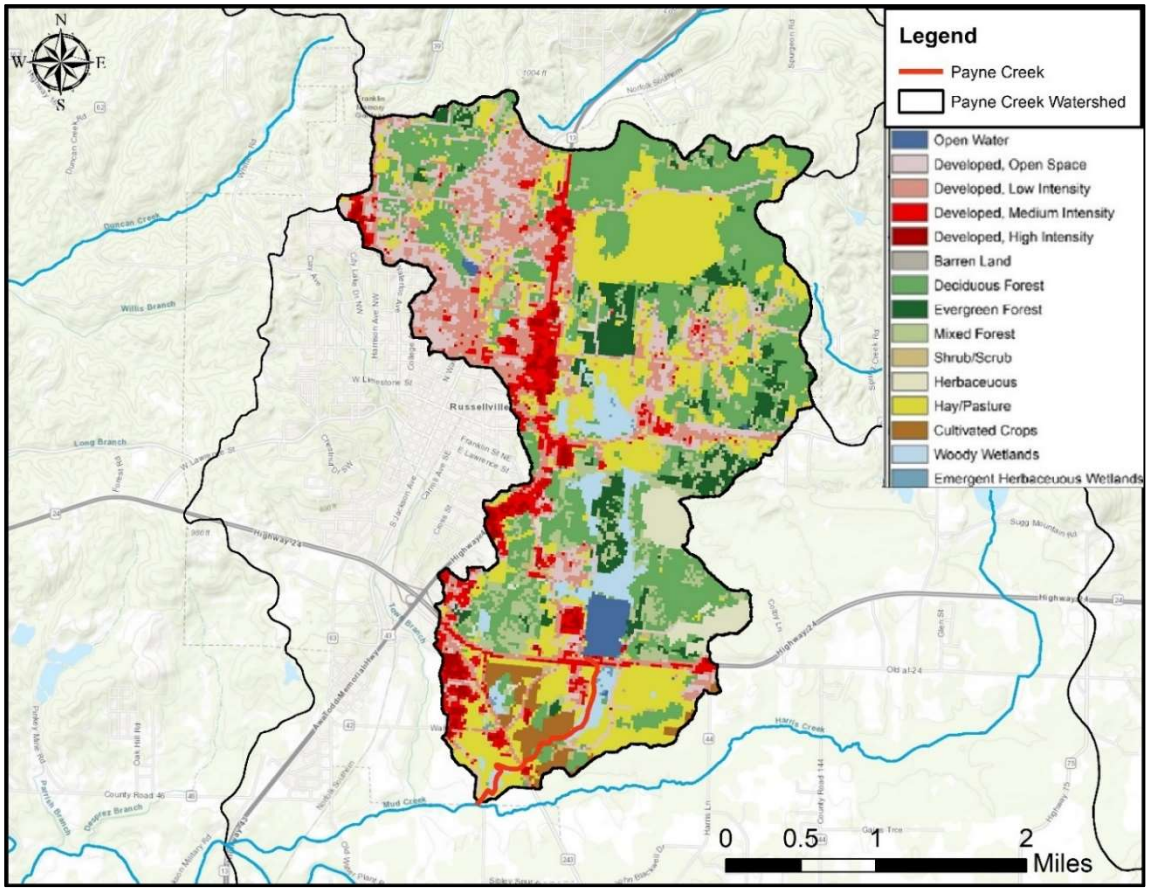


Figure 3.3.4: 2021 NLCD Map of the Payne Creek Watershed



3.4 Linkage between Numeric Targets and Sources

The predominant land use in the Harris Creek watershed is agriculture (55%), followed by forest/natural (33%). The most likely sources of pathogen loadings in Harris Creek are the agricultural land uses and stormwater runoff.

The predominant land use in the Payne Creek watershed is forest/natural (36%), followed by developed (31%) and agriculture (24%). Pollutant loadings from forested areas tend to be low due to their filtering capabilities and will be considered as background conditions. The most likely sources of pathogen loadings in Payne Creek are the agricultural land uses, stormwater runoff, unpermitted discharges of wastewater, and failing septic systems.

It is not considered a logical approach to calculate individual components for nonpoint source loadings. Hence, there will not be individual loads or reductions calculated for the various nonpoint sources. The loadings and reductions will only be calculated as a single total nonpoint source load and reduction.

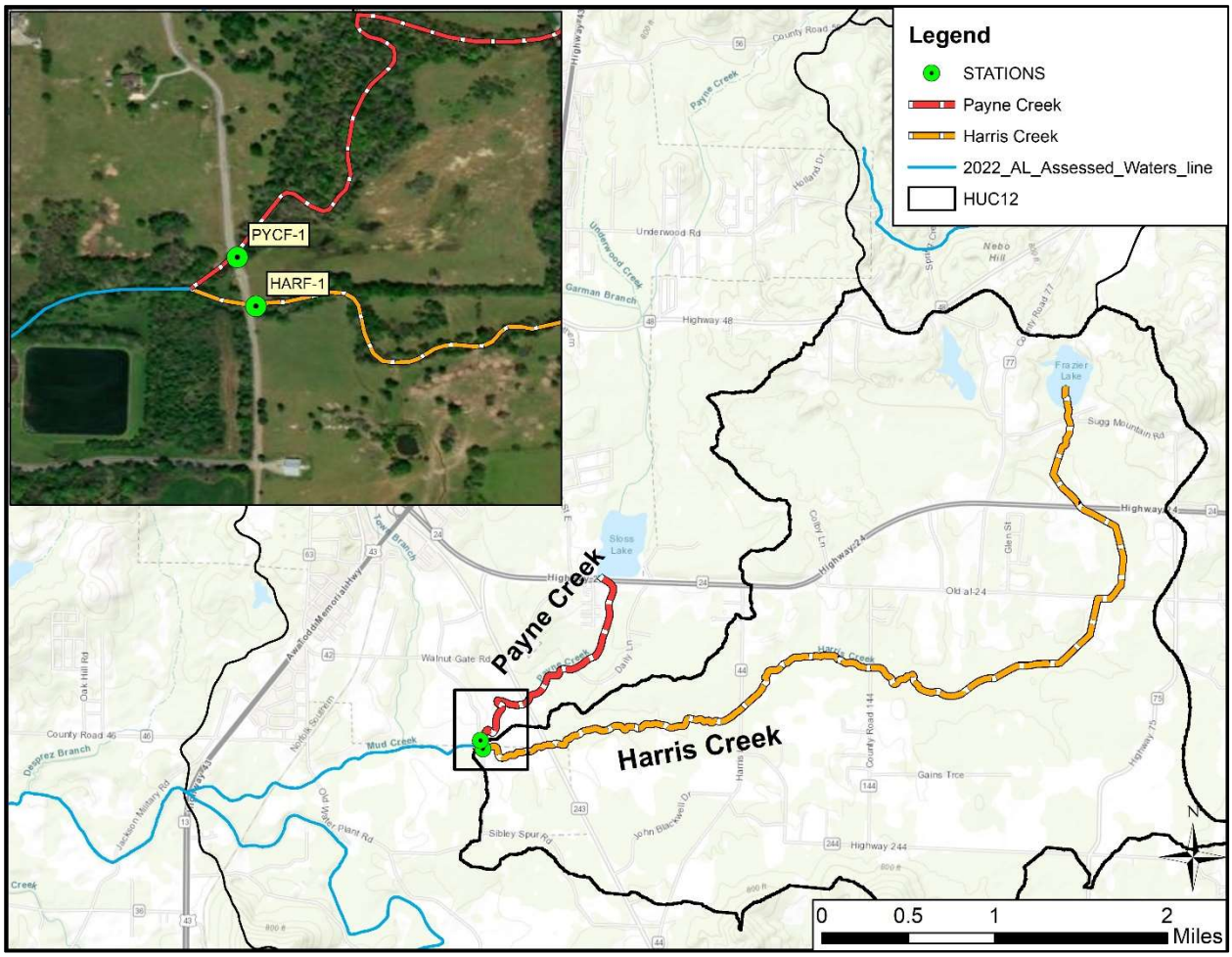
3.5 Data Availability and Analysis

The table and figure below depict the ADEM sampling stations in the Harris Creek and Payne Creek watersheds.

Table 3.5.1: ADEM Station Descriptions

Station	Latitude	Longitude	Description
HARF-1	34.469167	-87.723889	Harris Creek at Herrington Cr Rd above confluence with Payne Creek
PYCF-1	34.46985	-87.72415	Payne Creek at Herrington Cr Rd upstream of confluence with Harris Creek

Figure 3.5.1: ADEM Sampling Stations



3.5.1 Harris Creek – Water Quality Data Analysis

In 2017 and 2018, ADEM collected monthly (March – October) *E. coli* samples in Harris Creek at station HARF-1. In addition, in 2023, intensive bacteria studies were performed during the months of June and August at station HARF-1. Each intensive bacteria study consisted of collecting at least five *E. coli* bacteria samples over a thirty-day time window, with a minimum of 24 hours between each sample collection. A geometric mean was calculated from each intensive bacteria study. The 2017, 2018, and 2023 data were evaluated for this TMDL. The January 2024 edition of *Alabama's Water Quality Assessment and Listing Methodology,* prepared by ADEM, provides the rationale for the Department to use the most recent data to prepare a TMDL for an impaired waterbody.

A total of sixteen individual *E. coli* samples were collected at station HARF-1 during 2017-2018. Of the sixteen total *E. coli* samples, seven samples exceeded the single sample summer maximum criterion of 298 colonies/100 ml. In 2023, all eleven of the individual *E. coli* samples exceeded

the single sample summer criterion. Furthermore, both the June and August *E. coli* geometric means violated the geometric mean criterion of 126 colonies/100 ml. A summary of the *E. coli* results is provided below in Table 3.5.1. All *E. coli* criteria exceedances are highlighted in red.

Table 3.5.2: *E. coli* Data for Harris Creek

Station	Date_Time	Flow cfs	E. coli (MPN/DL)	DET_COND - E. coli (MPN/DL) mpn/dl	Single Sample Max Criterion (MPN/DL)	Calculated Geometric mean (MPN/DL)	Geometric mean Criterion (MPN/DL)
HARF-1	3/22/2017 8:01	8.1	920.8		2507		
HARF-1	4/12/2017 11:39	8.5	727	H	2507		
HARF-1	5/31/2017 12:43	3.9	121.1	H	298		
HARF-1	6/27/2017 13:04	4.5	**1203.3**	H	298		
HARF-1	7/12/2017 12:58	6.9	**727**	H	298		
HARF-1	8/7/2017 11:56	2.3	**410.6**	H	298		
HARF-1	9/20/2017 11:57	7.5	135.4	H	298		
HARF-1	10/18/2017 12:14	4.7	**547.5**	H	298		
HARF-1	3/19/2018 10:45	10.7	325.5		2507		
HARF-1	4/10/2018 10:20	11.8	172.2		2507		
HARF-1	5/2/2018 10:30	8.4	275.5		298		
HARF-1	6/12/2018 10:30	18.2	145		298		
HARF-1	7/11/2018 10:15	1.2	**410.6**		298		
HARF-1	8/7/2018 12:10		275.5		298		
HARF-1	9/12/2018 10:30	2.7	**461.1**		298		
HARF-1	10/10/2018 10:20	0.7	**920.8**		298		
HARF-1	6/8/2023 12:35	2.4	**2419.6**		298		
HARF-1	6/12/2023 13:25	8.2	**3465.8**		298		
HARF-1	6/15/2023 12:45	14.1	**387.3**		298	**1287**	126
HARF-1	6/21/2023 16:35	5.8	**547.5**		298		
HARF-1	6/26/2023 13:20	2.1	**1986.3**		298		
HARF-1	8/3/2023 12:00	1.3	**2419.6**	G	298		
HARF-1	8/7/2023 11:45	7	**686.7**		298		
HARF-1	8/14/2023 10:05	19.9	**2419.6**		298	**1209**	126
HARF-1	8/17/2023 10:40	11.2	**435.2**		298		
HARF-1	8/21/2023 12:00	8.9	**686.7**		298		
HARF-1	8/28/2023 11:45	8.8	**2599.4**		298		

H: The analytical holding times for analysis are exceeded

G: The analyte is present, but the amount of the analyte is determined to be above an acceptable level for quantitation

3.5.2 Payne Creek – Water Quality Data Analysis

As noted previously, Payne Creek was originally included on the §303(d) list based on monthly (March – October) *E. coli* data collected in 2018 at station PYCF-1. In 2023, intensive bacteria studies were performed during the months of June and August on Payne Creek at station PYCF-1. Each intensive bacteria study consisted of collecting at least five *E. coli* bacteria samples over a thirty-day time window, with a minimum of 24 hours between each sample collection. A geometric mean was calculated from each intensive bacteria study. The 2018 and 2023 data were evaluated for this TMDL. The January 2024 edition of *Alabama's Water Quality Assessment and Listing Methodology,* prepared by ADEM, provides the rationale for the Department to use the most recent data to prepare a TMDL for an impaired waterbody.

Eight *E. coli* samples were collected at station PYCF-1 in 2018. Of the eight total *E. coli* samples, four samples exceeded the single sample summer maximum criterion of 298 colonies/100 ml. In 2023, eight of the ten *E. coli* samples exceeded the single sample summer criterion. Furthermore, both the June and August *E. coli* geometric means violated the geometric mean criterion of 126 colonies/100 ml. A summary of the *E. coli* results is provided below in Table 3.5.2. All *E. coli* criteria exceedances are highlighted in red.

Table 3.5.3: *E. coli* Data for Payne Creek

STATION	Date_Time	Flow cfs	E. coli (MPN/DL)	Single Sample Max Criterion (MPN/DL)	Calculated Geometric mean (MPN/DL)	Geometric mean Criterion (MPN/DL)
PYCF-1	3/19/2018 9:40	17.4	1119.9	2507		
PYCF-1	4/10/2018 9:45	20.5	201.4	2507		
PYCF-1	5/2/2018 9:50	15.4	151.5	298		
PYCF-1	6/12/2018 10:00	4.8	142.1	298		
PYCF-1	7/11/2018 9:45	2	**980.4**	298		
PYCF-1	8/7/2018 11:45		**325.5**	298		
PYCF-1	9/12/2018 10:00	0.4	**1986.3**	298		
PYCF-1	10/10/2018 9:50	0.6	**980.4**	298		
PYCF-1	6/8/2023 12:00	3.1	**344.8**	298		
PYCF-1	6/12/2023 12:50	9.7	**1841.6**	298		
PYCF-1	6/15/2023 12:05	13.9	**547.5**	298	**517**	126
PYCF-1	6/21/2023 16:05	5.9	**325.5**	298		
PYCF-1	6/26/2023 12:10	2.5	**325.5**	298		
PYCF-1	8/3/2023 11:20	1.1	**547.5**	298		
PYCF-1	8/7/2023 11:20	9.2	201.4	298		
PYCF-1	8/14/2023 9:40	29.4	**476.4**	298	**425**	126
PYCF-1	8/21/2023 11:30	6.6	161.6	298		
PYCF-1	8/28/2023 11:20	4.2	**1632.8**	298		

3.6 Critical Conditions/Seasonal Variation

Critical conditions typically occur during the summer months (May-October). This can be explained by the nature of storm events in the summer versus the winter. In summer, periods of dry weather interspersed with thunderstorms allow for the accumulation and washing off of bacteria into streams, resulting in spikes of bacteria counts. In winter, frequent low intensity rain events are more typical and do not allow for the build-up of bacteria on the land surface, resulting in a more uniform loading rate.

The Harris Creek and Payne Creek watersheds generally follow the trends described above for the summer months of May through October. The critical condition was taken to be the one with the highest *E. coli* single sample exceedance value. The use of the highest exceedance to calculate the TMDL is expected to be protective of water quality in Harris Creek and Payne Creek year-round.

For Harris Creek, the single sample maximum concentration of 3465.8 colonies/100 ml collected on June 12, 2023, at station HARF-1 will be used to estimate the TMDL pathogen loadings in Harris Creek under critical conditions. A streamflow of 8.2 cfs was measured at station HARF-1 during this sampling event.

For Payne Creek, the single sample maximum concentration of 1986.3 colonies/100 ml collected on September 12, 2018, at station PYCF-1 will be used to estimate the TMDL pathogen loadings in Payne Creek under critical conditions. A streamflow of 0.4 cfs was measured at station PYCF-1 during this sampling event.

3.7 Margin of Safety

There are two methods for incorporating a Margin of Safety (MOS) in the TMDL analysis: 1) by implicitly incorporating the MOS using conservative model assumptions to develop allocations, or 2) by explicitly specifying a portion of the TMDL as the MOS and using the remainder for allocations.

The MOS accounts for the uncertainty associated with the limited availability of data used in this analysis. An explicit MOS was applied to the TMDL by reducing the appropriate target criterion concentration by ten percent and calculating a mass loading target with measured flow data. The single sample *E. coli* maximum value of 298 colonies/100 ml was reduced by 10% to 268.2 colonies/100 ml, while the geometric mean criterion was reduced in the same fashion to 113.4 colonies/100 ml.

4.0 TMDL Development

4.1 Definition of a TMDL

A total maximum daily load (TMDL) is the sum of individual waste load allocations (WLAs) for point sources, load allocations (LAs) for nonpoint sources including natural background levels, and a margin of safety (MOS). The margin of safety can be included either explicitly or implicitly and accounts for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. As discussed earlier, the MOS is explicit in this TMDL. A TMDL can be denoted by the equation:

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

The TMDL is the total amount of a pollutant that can be assimilated by the receiving waterbody while achieving water quality standards under critical conditions. Pathogen TMDL loads are typically expressed in terms of organism counts per day (colonies/day), in accordance with 40 CFR 130.2(i).

4.2 Load Calculations

A mass balance approach was used to calculate the pathogen TMDLs for Harris Creek and Payne Creek. The mass balance approach utilizes the conservation of mass principle. Total mass loads can be calculated by multiplying the *E. coli* concentration times the in-stream flow times a conversion factor. Existing loads were calculated for the highest single sample exceedance and the highest geometric mean sample exceedance. In the same manner, allowable loads were calculated for both the single sample criterion of 298 col/100 ml and the geometric mean criterion of 126 col/100 ml. The TMDL was based on the violation that produced the highest percent reduction of *E. coli* loads necessary to achieve applicable water quality criteria, whether it be the single sample or geometric mean.

4.2.1 Harris Creek - Existing Conditions

The **single sample** mass loading was calculated by multiplying the highest *E. coli* single sample exceedance concentration of 3465.8 colonies/100 ml by the measured flow on the day of the exceedance. The calculation for the existing condition was based on the measurement at HARF-1 on June 12, 2023, which can be found above in Table 3.5.1. The product of the concentration, measured flow, and a conversion factor gives the total mass loading (colonies per day) of *E. coli* in Harris Creek under the single sample exceedance condition.

$$\frac{8.2\ \text{ft}^3}{\text{s}} \times \frac{3465.8\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{6.95 \times 10^{11}\text{colonies}}{\text{day}}$$

The **geometric mean** mass loading was calculated by multiplying the highest geometric mean exceedance concentration of 1287 colonies/100 ml times the average of the five measured daily

stream flows. This concentration was calculated based on measurements at HARF-1 between June 8, 2023, and June 26, 2023, and can be found above in Table 3.5.1. The average stream flow was calculated to be 6.52 cfs. The product of the concentration, average flow, and the conversion factor gives the total mass loading (colonies per day) of *E. coli* in Harris Creek under the geometric mean exceedance condition.

$$\frac{6.52\ \text{ft}^3}{\text{s}} \times \frac{1287\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{2.05 \times 10^{11}\text{colonies}}{\text{day}}$$

4.2.2 Harris Creek - Allowable Conditions

The **allowable load** to the watershed was calculated under the same physical conditions as discussed above for the single sample and geometric mean criteria. This was done by taking the product of the measured flow for the violation event, the allowable concentration, and the conversion factor.

For the **single sample** *E. coli* target concentration of 268.2 colonies/100 ml, the allowable *E. coli* loading is:

$$\frac{8.2\ \text{ft}^3}{\text{s}} \times \frac{268.2\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{5.38 \times 10^{10}\text{colonies}}{\text{day}}$$

The explicit margin of safety of 29.8 colonies/100 ml equals a daily loading of:

$$\frac{8.2\ \text{ft}^3}{\text{s}} \times \frac{29.8\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{5.98 \times 10^{9}\text{colonies}}{\text{day}}$$

For the **geometric mean** *E. coli* target concentration of 113.4 colonies/100 ml, the allowable *E. coli* loading is:

$$\frac{6.52\ ft^3}{s} \times \frac{113.4\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100mL * s}{ft^3 * day} = \frac{1.81 \times 10^{10} colonies}{day}$$

The explicit margin of safety of 12.6 colonies/100 ml equals a daily loading of:

$$\frac{6.52\ ft^3}{s} \times \frac{12.6\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100\ mL * s}{ft^3 * day} = \frac{2.01 \times 10^{9} colonies}{day}$$

The difference between the existing conditions (violation event) and the allowable conditions converted to a percent reduction represents the total load reduction needed to achieve the *E. coli* water quality criteria. The TMDL was calculated as the total daily *E. coli* load in Harris Creek.

Table 4.2.1 below depicts the existing and allowable *E. coli* loads and required reductions for the Harris Creek watershed.

Table 4.2.1: Harris Creek - *E. coli* Loads and Required Reductions

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	6.95E+11	5.38E+10	6.41E+11	92%
Geometric Mean Load	2.05E+11	1.81E+10	1.87E+11	91%

From Table 4.2.1, compliance with the single sample maximum criterion of 298 colonies/100 ml requires a reduction of 92% in the *E. coli* load. The TMDL, WLA, LA and MOS values necessary to achieve the applicable *E. coli* criteria are provided in Table 4.2.2 below.

Table 4.2.2: *E. coli* TMDL for Harris Creek

TMDL[f]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[a]			Load Allocation (LA)	
		WWTPs[b]	Stormwater (MS4s[c] and other NPDES sources[d])	Leaking Collection Systems[e]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
5.98E+10	5.98E+09	N/A	92%	0	5.38E+10	92%

Note: NA = not applicable
a. There are currently no CAFOs in the Harris Creek watershed. Future CAFOs will be assigned a waste load allocation (WLA) of zero.
b. There are currently no WWTPs in the Harris Creek watershed. Future WWTPs must meet the applicable in-stream water quality criteria for pathogens at the point of discharge.
c. There are currently no MS4 areas in the Harris Creek watershed. Future MS4 areas will demonstrate consistency with the requirements of this TMDL through implementation and maintenance of BMPs on a case-by-case basis.
d. Other NPDES-permitted stormwater sources will demonstrate consistency with the requirements of this TMDL through implementation and maintenance of BMPs on a case-by-case basis. The percent reduction should not be interpreted as a numeric permit limitation.
e. The objective for leaking collection systems is a WLA of zero. It is recognized, however, that a WLA of 0 colonies/day may not be practical. For these sources, the WLA is interpreted to mean a reduction in *E. coli* loading to the maximum extent practicable, consistent with the requirement that these sources not contribute to a violation of the water quality criteria for *E. coli*.
f. TMDL was established using the single sample maximum criterion of 298 colonies/100 ml.

4.2.3 Payne Creek - Existing Conditions

The **single sample** mass loading was calculated by multiplying the highest *E. coli* single sample exceedance concentration of 1986.3 colonies/100 ml by the measured flow on the day of the exceedance. The calculation for the existing condition was based on the measurement at PYCF-1 on September 12, 2018, which can be found above in Table 3.5.2. The product of the concentration, measured flow, and a conversion factor gives the total mass loading (colonies per day) of *E. coli* in Payne Creek under the single sample exceedance condition.

$$\frac{0.4\ \text{ft}^3}{\text{s}} \times \frac{1986.3\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{1.94 \times 10^{10}\ \text{colonies}}{\text{day}}$$

The **geometric mean** mass loading was calculated by multiplying the highest geometric mean exceedance concentration of 517 colonies/100 ml times the average of the five measured daily stream flows. This concentration was calculated based on measurements at PYCF-1 between June 8, 2023, and June 26, 2023, and can be found above in Table 3.5.2. The average stream flow was calculated to be 7.02 cfs. The product of the concentration, average flow, and the conversion factor gives the total mass loading (colonies per day) of *E. coli* in Payne Creek under the geometric mean exceedance condition.

$$\frac{7.02\ \text{ft}^3}{\text{s}} \times \frac{517\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{8.87 \times 10^{10}\ \text{colonies}}{\text{day}}$$

4.2.4 Payne Creek - Allowable Conditions

The **allowable load** to the watershed was calculated under the same physical conditions as discussed above for the single sample and geometric mean criteria. This was done by taking the product of the measured flow for the violation event, the allowable concentration, and the conversion factor.

For the **single sample** *E. coli* target concentration of 268.2 colonies/100 ml, the allowable *E. coli* loading is:

$$\frac{0.4\ \text{ft}^3}{\text{s}} \times \frac{268.2\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{2.62\ \times 10^{9}\text{colonies}}{\text{day}}$$

The explicit margin of safety of 29.8 colonies/100 ml equals a daily loading of:

$$\frac{0.4\ \text{ft}^3}{\text{s}} \times \frac{29.8\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{2.92 \times 10^{8}\text{colonies}}{\text{day}}$$

For the **geometric mean** *E. coli* target concentration of 113.4 colonies/100 ml, the allowable *E. coli* loading is:

$$\frac{7.02\ ft^3}{s} \times \frac{113.4\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100mL * s}{ft^3 * day} = \frac{1.95 \times 10^{10} colonies}{day}$$

The explicit margin of safety of 12.6 colonies/100 ml equals a daily loading of:

$$\frac{7.02\ ft^3}{s} \times \frac{12.6\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100\ mL * s}{ft^3 * day} = \frac{2.16 \times 10^9 colonies}{day}$$

The difference between the existing conditions (violation event) and the allowable conditions converted to a percent reduction represents the total load reduction needed to achieve the *E. coli* water quality criteria. The TMDL was calculated as the total daily *E. coli* load in Payne Creek. Table 4.2.3 below depicts the existing and allowable *E. coli* loads and required reductions for the Payne Creek watershed.

Table 4.2.3: Payne Creek - *E. coli* Loads and Required Reductions

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	1.94E+10	2.62E+09	1.68E+10	86%
Geometric Mean Load	8.87E+10	1.95E+10	6.93E+10	78%

From Table 4.2.3, compliance with the single sample maximum criterion of 298 colonies/100 ml requires a reduction of 86% in the *E. coli* load. The TMDL, WLA, LA and MOS values necessary to achieve the applicable *E. coli* criteria are provided in Table 4.2.4 below.

Table 4.2.4: *E. coli* TMDL for Payne Creek

TMDL[f]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[a]			Load Allocation (LA)	
		WWTPs[b]	Stormwater (MS4s[c] and other NPDES sources[d])	Leaking Collection Systems[e]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
2.92E+9	2.92E+8	N/A	N/A	0	2.62E+9	86%

Note: NA = not applicable

a. There are currently no CAFOs in the Payne Creek watershed. Future CAFOs will be assigned a waste load allocation (WLA) of zero.

b. There are currently no WWTPs in the Payne Creek watershed. Future WWTPs must meet the applicable in-stream water quality criteria for pathogens at the point of discharge.

c. There are currently no MS4 areas in the Payne Creek watershed. Future MS4 areas will demonstrate consistency with the requirements of this TMDL through implementation and maintenance of BMPs on a case-by-case basis.

d. There are currently no NPDES-permitted stormwater sources in the Payne Creek watershed. Future NPDES-permitted stormwater sources will demonstrate consistency with the requirements of this TMDL through implementation and maintenance of BMPs on a case-by-case basis.

e. The objective for leaking collection systems is a WLA of zero. It is recognized, however, that a WLA of 0 colonies/day may not be practical. For these sources, the WLA is interpreted to mean a reduction in *E. coli* loading to the maximum extent practicable, consistent with the requirement that these sources not contribute to a violation of the water quality criteria for *E. coli*.

f. TMDL was established using the single sample maximum criterion of 298 colonies/100 ml.

4.3 TMDL Summary

Harris Creek was placed on Alabama's §303(d) list in 2018 based on data collected in 2014 at station HARF-1. A mass balance approach was used to calculate the *E. coli* TMDL for Harris Creek. Based on the TMDL analysis, it was determined that a 92% reduction in *E. coli* loading was necessary to achieve compliance with applicable water quality standards.

Payne Creek was placed on Alabama's §303(d) list in 2020 based on data collected in 2018 at station PYCF-1. A mass balance approach was used to calculate the *E. coli* TMDL for Payne Creek. Based on the TMDL analysis, it was determined that an 86% reduction in *E. coli* loading was necessary to achieve compliance with applicable water quality standards.

Compliance with the terms and conditions of existing and future NPDES sanitary and storm water permits will effectively implement the WLA and demonstrate consistency with the assumptions and requirements of the TMDL.

Required load reductions in the LA portion of this TMDL will be implemented through voluntary measures/best management practices (BMPs). Cooperation and active participation by the general public and various other groups is critical to successful implementation of TMDLs. Local citizen-led and implemented management measures offer the most efficient and comprehensive avenue for reduction of loading rates from nonpoint sources. Therefore, TMDL implementation activities for nonpoint sources will be coordinated through interaction with local entities and may be eligible for CWA §319 grants through the Department's Nonpoint Source Unit.

The Department recognizes that adaptive implementation of this TMDL will be needed to achieve applicable water quality criteria, and we are committed to targeting the load reductions to improve water quality. As additional data and/or information become available, it may become necessary to revise and/or modify the TMDL accordingly.

5.0 Follow-up Monitoring

ADEM has adopted a basin approach to water quality monitoring, an approach that divides Alabama's sixteen major river basins into three groups. Each year, ADEM's water quality resources are concentrated in one of the three basin groups and are divided among multiple priorities including §303(d) listed waterbodies, waterbodies with active TMDLs, and other waterbodies as determined by the Department. Monitoring will help further characterize water quality conditions resulting from the implementation of best management practices and load reductions in the watershed. This monitoring will occur in each basin according to the schedule shown in Table 5.1.

Table 5.1: Follow-up Monitoring Schedule

River Basin Group	Years to be Monitored
Black Warrior, Blackwater, Chattahoochee, Chipola, Choctawhatchee, Escambia, Perdido, Tennessee (Wheeler), Yellow	2024/2027
Coosa, Escatawpa, Tennessee (Guntersville), Tombigbee	2025/2028
Alabama, Cahaba, Mobile, Tallapoosa, Tennessee (Pickwick and Wilson)	2026/2029

6.0 Public Participation

As part of the public participation process, this TMDL was placed on public notice and made available for review and comment. The public notice was prepared and published in four newspapers in Montgomery, Huntsville, Birmingham, and Mobile, as well as submitted to persons who requested to be on ADEM's postal and electronic mailing distributions. In addition, the public notice and subject TMDL were made available on ADEM's Website: www.adem.alabama.gov. The public could also request paper or electronic copies of the TMDL by contacting Ms. Kimberly Minton at 334-271-7826 or kminton@adem.alabama.gov. The public was given an opportunity to review the TMDL and submit comments to the Department in writing. No written comments were received during the public notice period.

7.0 Appendices

7.1 References

ADEM Administrative Code, 2021. Water Division - Water Quality Program, Chapter 335-6-10, Water Quality Criteria.

ADEM Administrative Code, 2021. Water Division - Water Quality Program, Chapter 335-6-11, Use Classifications for Interstate and Intrastate Waters.

Alabama Department of Environmental Management (ADEM), *Alabama's Water Quality Assessment and Listing Methodology*, 2022.

Alabama's §303(d) List and Fact Sheet. 2018, 2020, 2022, ADEM.

United States Environmental Protection Agency, 1991. Guidance for Water Quality-Based Decisions: The TMDL Process. Office of Water. EPA 440/4-91-001.

United States Environmental Protection Agency, 1986. Quality Criteria for Water. Office of Water. EPA 440/4-91-001.

7.2 Sanitary Sewer Overflows (SSOs)

Permit Number	Facility/Site Name	SSO Start Date/Time	SSO End Date/Time	SSO Range	SSO Location	SSO Latitude	SSO Longitude
AL0027987	Radford "Joe" Murray WWTP	2/13/18 5:30 AM	2/13/18 9:00 AM	250,000 < gallons <=500,000	Next to old sewer plant, trunk line failure between Jackson Ave and Highway 43	34.487409	-87.734858
AL0027987	Radford "Joe" Murray WWTP	3/1/18 1:45 PM	3/1/18 6:00 PM	1,000 < gallons <=10,000	Walnut Gate Road, Russellville AL	34.476840	-87.723468
AL0027987	Radford "Joe" Murray WWTP	7/31/18 7:00 AM	7/31/18 10:30 AM	<=1,000 gallons	Panda Chinese Buffet Restaurant Hwy 43, Russellville AL	34.504200	-87.717200
AL0027987	Radford "Joe" Murray WWTP	1/13/19 7:00 AM	1/13/19 7:15 AM	<=1,000 gallons	14695 Highway 43 in front of Panda Chinese Restaurant	34.504200	-87.717200
AL0027987	Radford "Joe" Murray WWTP	2/22/19 8:00 AM	2/25/19 12:00 AM	75,000 < gallons <=100,000	Walnut Gate Rd	34.476667	-87.723334
AL0027987	Radford "Joe" Murray WWTP	2/22/19 1:00 PM	2/24/19 6:15 AM	25,000 < gallons <=50,000	Corner of Walnut St and Lawrence	34.506693	-87.738858
AL0027987	Radford "Joe" Murray WWTP	2/22/19 7:15 AM	2/24/19 7:10 AM	25,000 < gallons <=50,000	Tyler Ave and Duncan Creek manhole	34.514017	-87.737061
AL0027987	Radford "Joe" Murray WWTP	12/22/19 11:00 PM	12/23/19 11:40 AM	50,000 < gallons <=75,000	Walnut Gate Road , Russellville AL	34.476840	-87.723468
AL0027987	Radford "Joe" Murray WWTP	2/6/20 8:10 AM	2/6/20 8:00 PM	100,000 < gallons <=250,000	Walnut Gate Road	34.476840	-87.723468
AL0027987	Radford "Joe" Murray WWTP	2/12/20 7:00 AM	2/12/20 10:00 AM	100,000 < gallons <=250,000	Walnut Gate Road	34.476840	-87.723468
AL0027987	Radford "Joe" Murray WWTP	8/26/20 9:00 AM	8/26/20 3:30 PM	250,000 < gallons <=500,000	Walnut Gate Rd	34.476800	-87.723400
AL0027987	Radford "Joe" Murray WWTP	3/25/21 2:30 PM	3/25/21 4:00 PM	50,000 < gallons <=75,000	inspection box on Walnut Gate Rd	34.476800	-87.723400
AL0027987	Radford "Joe" Murray WWTP	3/28/21 9:00 AM	3/28/21 11:00 AM	50,000 < gallons <=75,000	Walnut Gate Road	34.476800	-87.723400
AL0027987	Radford "Joe" Murray WWTP	7/5/23 10:30 AM	7/5/23 11:30 AM	<=1,000 gal	Lift Station supplying Panda Restaurant	34.504450	-87.717244
AL0027987	Radford "Joe" Murray WWTP	1/24/24 3:00 PM	1/25/24 8:00 PM	250,000 < gallons <= 500,000	line to the north of Walnut Gate Rd that runs parallel to roadway	34.476969	-87.724961
AL0027987	Radford "Joe" Murray WWTP	1/25/24 2:32 PM	1/25/24 7:30 PM	<=1,000 gal	Trailer Park manhole	34.479761	-87.712871

7.3 Harris Creek Watershed Photos

Figure 7.3.1: At Station HARF-1: Upstream View (6/8/2023)

Figure 7.3.2: At Station HARF-1: Downstream View (6/8/2023)

Figure 7.3.3: At Station HARF-1: Upstream View (8/3/2023)

Figure 7.3.4: At Station HARF-1: Downstream View (8/3/2023)

Figure 7.3.5: At Station HARF-1: Upstream View (8/14/2023)

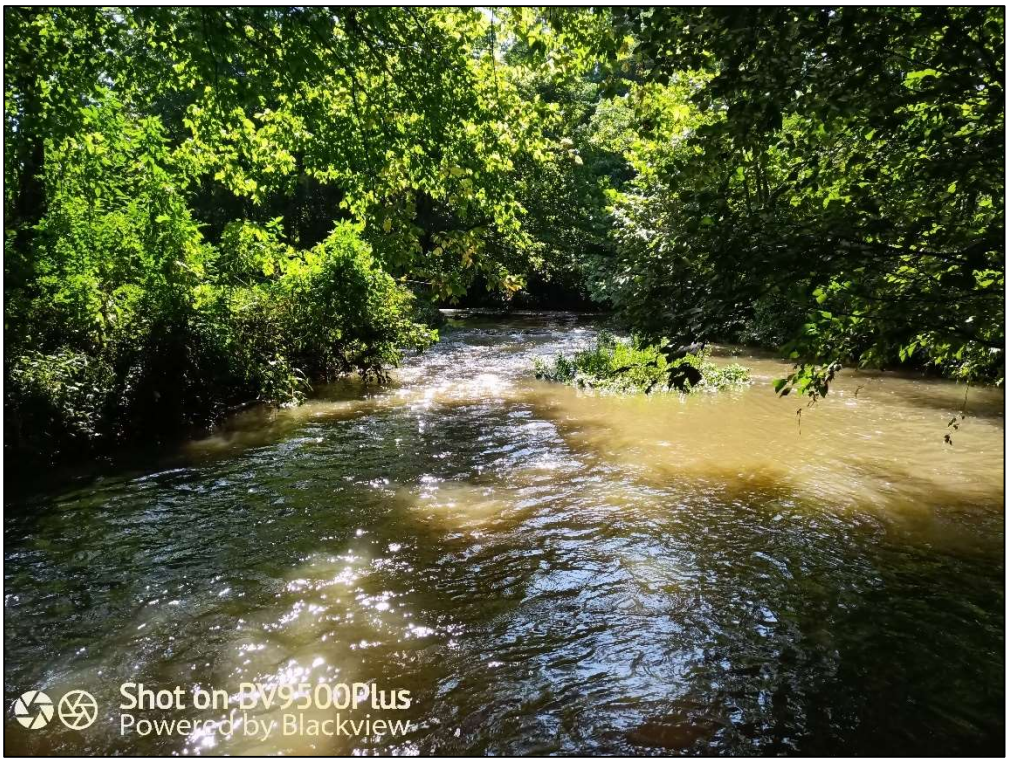


Figure 7.3.6: At Station HARF-1:: Downstream View (8/14/2023)

7.4 Payne Creek Watershed Photos

Figure 7.4.1: At Station PYCF-1: Upstream View (6/12/2023)

Figure 7.4.2: At Station PYCF-1: Downstream View (6/12/2023)

Figure 7.4.3: At Station PYCF-1: Upstream View (8/3/23)

Figure 7.4.4: At Station PYCF-1: Downstream (8/3/2023)

Figure 7.4.5: At Station PYCF-1: Upstream View (8/28/23)

Figure 7.4.6: At Station PYCF-1: Downstream View (8/28/23)