



Assessment Decision Report

Dog River

Assessment Unit ID: AL03160205-0102-101

OE/DO

Pathogens

Alabama Department of Environmental Management
Water Quality Branch
Water Division
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Table of Contents

1.0	Executive Summary	3
	Table 1.1 Dog River Assessment Unit Information	3
	Figure 1.1: Dog River Impairment.....	4
2.0	Water Quality Criteria.....	5
	2.1 Dissolved Oxygen	5
	2.2. Bacteria (Enterococci).....	6
4.0	Data Availability & Analysis.....	6
5.0	Conclusion	6
6.0	Appendix: Water Quality Data	7
	Table 6.1: Dog River Nutrient Data: DGRM-1A.....	7
	Table 6.2: Dog River Pathogen & CBOD-5 Data: DGRM-1A	8

1.0 Executive Summary

Located in the Mobile River Basin in Mobile, Alabama, this section of Dog River from Mobile Bay to Halls Mill Creek, is classified as *Swimming and Other Whole Body Water-Contact Sports (S)/Fish and Wildlife (F&W)*. Dog River is a shallow, tidally influenced, brackish bay connected by a small channel to Mobile Bay. The majority of the watershed is located within the City of Mobile. It was originally placed on the State of Alabama's §303(d) use impairment list in 1996 as impaired by pathogen pollution (fecal coliform bacteria) due to urban runoff/storm sewers and sanitary sewer collection system failure. Dog River was also listed as impaired in 1996 for low dissolved oxygen (DO) levels caused by organic loading (CBOD & NBOD).

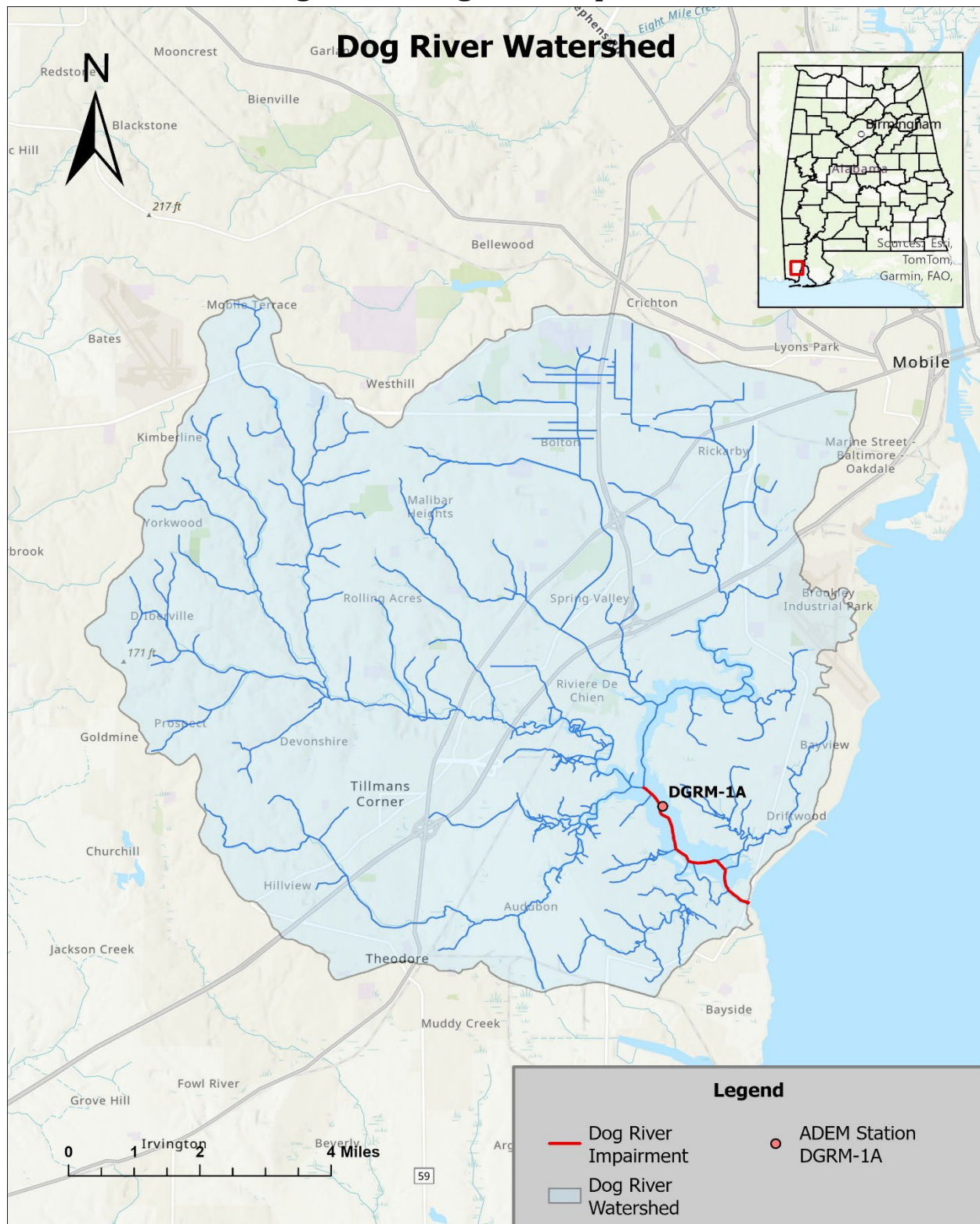
In order to address the pathogen and dissolved oxygen impairments, TMDLs were developed and approved by EPA in 2005. Rabbit Creek (upstream watershed) and Dog River watersheds experienced major and frequent sanitary sewer overflows (SSOs) for many years from the collection systems of the Mobile Area Water and Sewer Service. Extremely high levels of fecal coliform bacteria were measured at sites in both watersheds. Also, in both watersheds, hydrologic conditions that affect water quality include long hydraulic residence times during low flow conditions and density stratification due to salinity intrusion from Mobile Bay and heating of surface waters. Low dissolved oxygen levels were caused by oxygen consuming organic matter from both natural and anthropogenic sources that settle in tidal areas and exerts high sediment oxygen demand (SOD) on the water column.

Water quality sampling was conducted on Dog River at ADEM Station DGRM-1A (Figure 1.1) in 2020 and 2023 (see Tables 6.1 & 6.2 in the Appendix for the dissolved oxygen, nutrient, and pathogen data collected during those years). This Assessment Decision Report (ADR) summarizes the recent water quality data collected on Dog River. Based on recent data, ADEM has determined that this segment of Dog River is no longer impaired for organic enrichment (OE)/dissolved oxygen (DO) or pathogens.

Table 1.1 Dog River Assessment Unit Information

Assessment Unit ID	Waterbody Name	Downstream	Upstream	Size
AL03160205-0102-101	Dog River	Mobile Bay	Halls Mill Creek	2.79 miles

TMDL Listing	NTTS ID	Approval Date	Pollutants
AL/03160205 020-02	11313	04/12/2005	OE/DO & Pathogens

Figure 1.1: Dog River Impairment

2.0 Water Quality Criteria

2.1 Dissolved Oxygen

According to ADEM's Water Quality Criteria (Administrative Code 335-6-10), the minimum dissolved oxygen concentration allowed in a stream classified as *Swimming and Other Whole Body Water-Contact Sports (S)* and *Fish and Wildlife (F&W)* is 5.0 mg/L. The target is established at a depth of 5 feet in water 10 feet or greater in depth. For waters less than 10 feet in depth, the dissolved oxygen criterion is applied at mid-depth.

The dissolved oxygen criteria for streams classified as *Swimming and Other Whole Body Water-Contact Sports (S)* and *Fish and Wildlife (F&W)* are described in ADEM Admin. Code R. 335-6-10-.09(5)(e)4.(i) through (iv) as follows:

- (i) For a diversified warm water biota, including game fish, daily dissolved oxygen concentrations shall not be less than 5 mg/l at all times; except under extreme conditions due to natural causes, it may range between 5 mg/l and 4 mg/l, provided that the water quality is favorable in all other parameters. The normal seasonal and daily fluctuations shall be maintained above these levels. In no event shall the dissolved oxygen level be less than 4 mg/l due to discharges from existing hydroelectric generation impoundments. All new hydroelectric generation impoundments, including addition of new hydroelectric generation units to existing impoundments, shall be designed so that the discharge will contain at least 5 mg/l dissolved oxygen where practicable and technologically possible. The Environmental Protection Agency, in cooperation with the State of Alabama and parties responsible for impoundments, shall develop a program to improve the design of existing facilities.
- (ii) In coastal waters, surface dissolved oxygen concentrations shall not be less than 5 mg/l, except where natural phenomena cause the value to be depressed.
- (iii) In estuaries and tidal tributaries, dissolved oxygen concentrations shall not be less than 5 mg/l, except in dystrophic waters or where natural conditions cause the value to be depressed.
- (iv) In the application of dissolved oxygen criteria referred to above, dissolved oxygen shall be measured at a depth of 5 feet in waters 10 feet or greater in depth; and for those waters less than 10 feet in depth, dissolved oxygen criteria will be applied at mid-depth.

2.2. Bacteria (Enterococci)

According to ADEM's Water Quality Assessment and Listing Methodology (WQALM), the bacteria criteria for coastal waterbodies that are classified as *Swimming and Other Whole Body Water-Contact Sports* are as follows:

- (i) Geometric Mean ≤ 35 colonies/100 ml
- (ii) Single Sample Max ≤ 104 colonies/100 ml

4.0 Data Availability & Analysis

For the current six-year assessment period (2019-2024), ADEM collected water quality data at station DGRM-1A in 2020 and 2023. Tables 6.1 and 6.2 include dissolved oxygen (DO), chlorophyll a (Chl a), total phosphorus (TP), total nitrogen (TN), nitrate + nitrite (NO₃ + NO₂), Total Kjeldahl Nitrogen (TKN), enterococci, and carbonaceous biochemical oxygen demand (CBOD). Data in 2020 includes seven measurements for each parameter while 2023 includes eight measurements. Tables 6.1 and 6.2 also include the detect conditions for the nutrients and pathogens.

An evaluation of the data showed that there were no exceedances in DO or pathogens. DO concentrations ranged from 5.3 mg/L to 9.7 mg/L in 2020 and 6 mg/L to 8.6 mg/L in 2023. Enterococci ranged from 10 MPN to 20 MPN in 2020 and 10 MPN to 31 MPN in 2023. The assessment of the water quality data in the appendix shows that this segment of Dog River is currently meeting the criteria for DO and bacteria.

5.0 Conclusion

Based on the analysis of the water quality data collected on the 2.79-mile segment of Dog River from Mobile Bay to Halls Mill Creek from 2019-2024, it is evident that all data are currently meeting criteria for the *S/F&W* use classification. Consequently, ADEM has determined that Dog River is no longer impaired for OE/DO or pathogens.

6.0 Appendix: Water Quality Data

Table 6.1: Dog River Nutrient Data: DGRM-1A

Station ID	Visit Date	DO mg/L	Chl a mg/m ³	Chl a Detect Condition	TP mg/L	TP Detect Condition	TN mg/L	NO2+NO3 mg/l	Adjusted NO2+NO3 1/2 MDL	NO2+NO3 Detect Condition	TKN mg/L	Adjusted TKN 1/2 MDL	TKN Detect Condition
DGRM-1A	3/3/2020	9.7	2.3		0.061		1.015	0.375			0.64		JQ
DGRM-1A	5/6/2020	7.2	3.5		0.07		0.7515	0.003	0.0015	< MDL .003	0.75		
DGRM-1A	6/2/2020	7.2	1.1		0.032	JI	0.719	0.029	0.0145	< MDL .029	0.69		
DGRM-1A	7/8/2020	5.3	3.2		0.03	JI	0.0745	0.029	0.0145	< MDL .029	0.12	0.06	< MDL .12
DGRM-1A	8/18/2020	6.1	3.8		0.055		0.6445	0.029	0.0145	< MDL .029	0.63		
DGRM-1A	9/10/2020	6.9	1	< MDL 1, Y	0.035	JI	0.7045	0.029	0.0145	< MDL .029	0.69		
DGRM-1A	10/20/2020	7.7	1	< MDL 1	0.057		0.5245	0.029	0.0145	< MDL .029	0.51		
DGRM-1A	3/2/2023	7.5	8.4		0.046		0.5795	0.039	0.0195	< MDL .039	0.56		
DGRM-1A	4/5/2023	7.7	1.1		0.058		0.5795	0.039	0.0195	< MDL .039	0.56		
DGRM-1A	5/1/2023	8.6	9.6		0.045		0.6395	0.039	0.0195	< MDL .039	0.62		
DGRM-1A	6/14/2023	6.7	5.4		0.053		0.4795	0.039	0.0195	< MDL .039	0.46		
DGRM-1A	7/10/2023	6	9.7		0.064		0.7895	0.039	0.0195	< MDL .039	0.77		
DGRM-1A	8/3/2023	6.4	11		0.058		0.6295	0.039	0.0195	< MDL .039	0.61		
DGRM-1A	9/19/2023	6.3	6.7		0.058		0.7095	0.039	0.0195	< MDL .039	0.69		
DGRM-1A	10/12/2023	6.3	1	< MDL 1	0.055		0.4795	0.039	0.0195	< MDL .039	0.46		

Table 6.2: Dog River Pathogen & CBOD-5 Data: DGRM-1A

Station ID	Visit Date	Enterococci mpn/dl	Enterococci Detect Condition	CBOD-5 mg/l	CBOD-5 Detect Condition
DGRM-1A	3/3/2020	10	J1	2	< MDL 2, JQ1
DGRM-1A	5/6/2020	10	L1	2	< MDL 2, JQ1
DGRM-1A	6/2/2020	10	L1	2	< MDL 2
DGRM-1A	7/8/2020	20	J1	2.5	JQ
DGRM-1A	8/18/2020	20	J1	4.1	JQ1
DGRM-1A	9/10/2020	10	J1	2.2	JH
DGRM-1A	10/20/2020	10	J1	2	< MDL 2, JQ
DGRM-1A	3/2/2023	30	J1	2	< MDL 2, JQ1
DGRM-1A	4/5/2023	10	L1	2	< MDL 2
DGRM-1A	5/1/2023	10	J1	2	< MDL 2, JQ
DGRM-1A	6/14/2023	10	J10	2.2	JQ
DGRM-1A	7/10/2023	10	L1	2.4	JQ
DGRM-1A	8/3/2023	31	J1	2.9	JQ1
DGRM-1A	9/19/2023	10	L1	3	JQ
DGRM-1A	10/12/2023	10	J1	2	< MDL 2, JQ1