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Proposed

Total Maximum Daily Loads

for

Dog Branch

WBID 2578

Nutrients and Dissolved Oxygen

September 30, 2009

Region 4 serving the southeast

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SUMMARY SHEET

Total Maximum Daily Load (TMDL)

1. 303(d) Listed Segment: 2578: Dog Branch
   Lower St. Johns River

2. TMDL Endpoints/Targets: Nutrients and Dissolved Oxygen

3. TMDL Technical Approach Nutrient targets obtained from previously modeled basins for 2009 proposal cycle.

4. TMDL Waste Load and Load Allocation:

	Observed			Reference Modeled			LA & MS4		
WBID	Total Nitrogen (mg/l)	Total Phosphorus (mg/l)	BOD (mg/l)	Total Nitrogen (mg/l)	Total Phosphorus (mg/l)	BOD (mg/l)	% Reduction Total Nitrogen	% Reduction Total Phosphorus	% Reduction BOD
2589	1.74	0.30	1.90	0.69	0.09	1.78	60%	70%	7%

5. Endangered Species Present: No

6. USEPA Lead TMDL or Other: USEPA

7. TMDL Considers Point Sources/Non Point Sources: MS4 and Non Point Source

8. Major NPDES Discharges to surface waters addressed in USEPA TMDL: None

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1. Introduction

Section 303(d) of the Clean Water Act requires each state to list those waters within its boundaries for which technology based effluent limitations are not stringent enough to protect any water quality standard applicable to such waters. Listed waters are prioritized with respect to designated use classifications and the severity of pollution. In accordance with this prioritization, states are required to develop Total Maximum Daily Loads (TMDLs) for those water bodies that are not meeting water quality standards. The TMDL process establishes the allowable loadings of pollutants or other quantifiable parameters 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 from both point and nonpoint sources and restore and maintain the quality of their water resources (USEPA, 1991).

The State of Florida Department of Environmental Protection (FDEP) developed a statewide, watershed-based approach to water resource management. Under the watershed management approach, water resources are managed on the basis of natural boundaries, such as river basins, rather than political boundaries. The watershed management approach is the framework FDEP uses for implementing TMDLs. The state's 52 basins are divided into five groups. Water quality is assessed in each group on a rotating five-year cycle. Lower St. Johns River is a Group TMDL_GROUP basin; it was scheduled for TMDL development by a consent decree. FDEP established five water management districts (WMD) responsible for managing ground and surface water supplies in the counties encompassing the districts. Dog Branch (WBID 2578) is located in the St. Johns River Water Management District (SJRWMD).

For the purpose of planning and management, the WMDs divided each district into planning units defined as either an individual primary tributary basin or a group of adjacent primary tributary basins with similar characteristics. These planning units contain smaller, hydrological based units called drainage basins, which are further divided by FDEP into "water segments". A water segment usually contains only one unique waterbody type (stream, lake, canal, etc.) and is about 5 square miles in size. Unique numbers or waterbody identification (WBIDs) numbers are assigned to each water segment.

2. Problem Definition

The TMDLs addressed in this document are being established pursuant to commitments made by the United States Environmental Protection Agency (EPA) in the 1998 Consent Decree in the Florida TMDL lawsuit (Florida Wildlife Federation, et al. v. Carol Browner, et al., Civil Action No. 4: 98CV356-WS, 1998). That Consent Decree established a schedule for TMDL development for waters listed on Florida's EPA approved 1998 section 303(d) list. The 1998 section 303(d) list identified numerous Water Body Identifications (WBIDs) in the Lower St. Johns River Basin as not supporting water quality standards (WQS). After assessing all readily available water quality data, EPA is responsible for developing a TMDL in WBID 2578 Dog Branch

(Figure 1). The parameters addressed in these TMDLs are Nutrients and Dissolved Oxygen.

Most waterbodies in the Lower St. Johns River are designated as Class III waters having a designated use for recreation, and propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The level of impairment is denoted as threatened, partially or not supporting designated uses. A waterbody that is classified as threatened currently meets WQS but trends indicate the designated use may not be met in the next listing cycle. A waterbody classified as partially supporting designated uses is defined as somewhat impacted by pollution and water quality criteria are exceeded on some frequency. For this category, water quality is considered moderately impacted. A waterbody that is categorized as not supporting is highly impacted by pollution and water quality criteria are exceeded on a regular or frequent basis. In such waterbodies, water quality is considered severely impacted.

To determine the status of surface water quality in the state, three categories of data – chemistry data, biological data, and fish consumption advisories – were evaluated to determine potential impairments. The level of impairment is defined in the Identification of Impaired Surface Waters Rule (IWR), Section 62-303 of the Florida Administrative Code (F.A.C.). The IWR is FDEP's methodology for determining whether waters should be included on the state's planning list and verified list. Potential impairments are determined by assessing whether a waterbody meets the criteria for inclusion on the planning list. Once a waterbody is on the planning list, additional data and information will be collected and examined to determine if the water should be included on the verified list.

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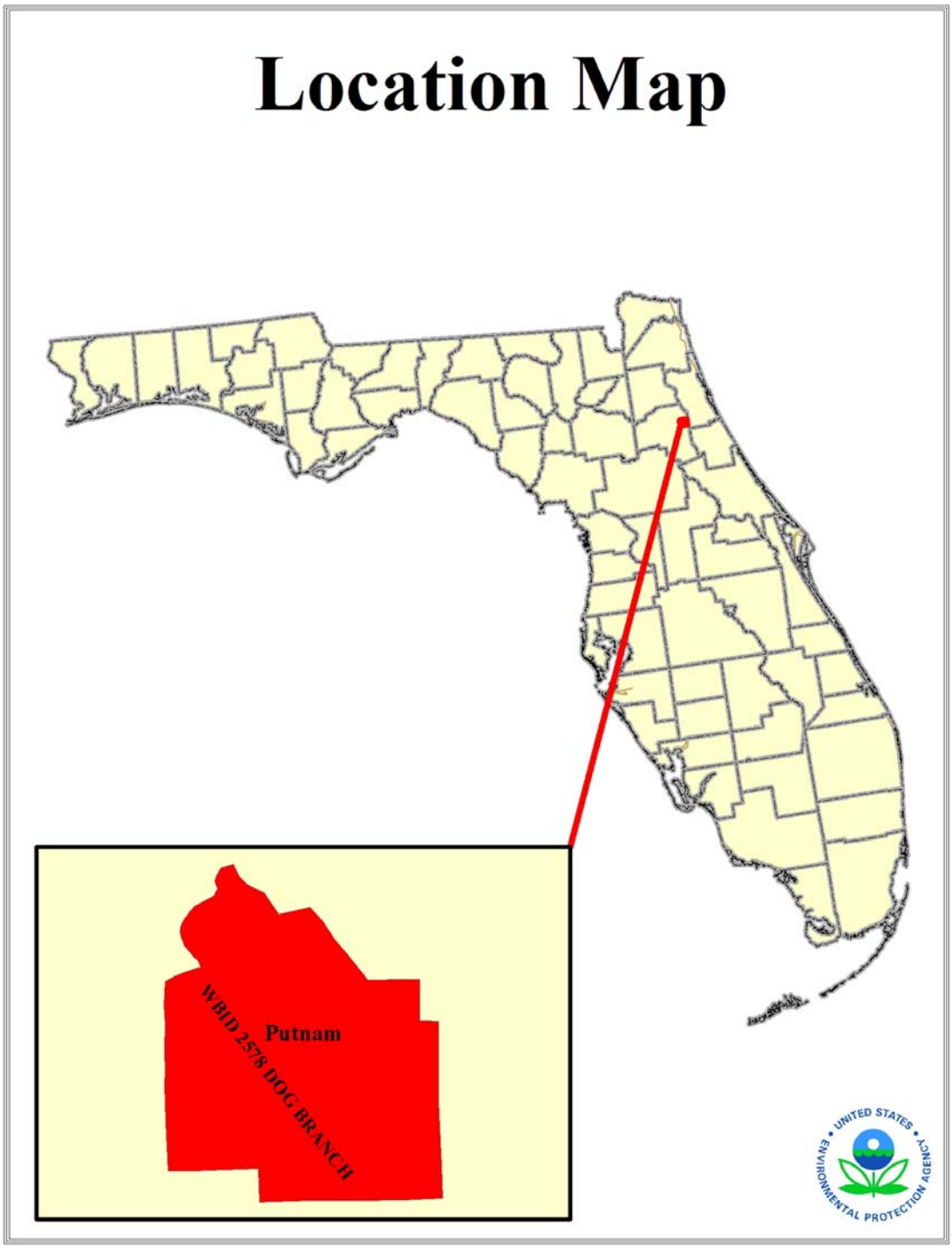

Figure 1 Location Map Dog Branch

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3. Watershed Description

Dog Branch is located in the northeastern portion of Putnam County, just north of East Palatka. Dog Branch flows primarily in a northerly direction into the St. Johns River and drains an area of about 3.7 square miles. The creek is approximately 2.9 miles long and is a second order stream. County road 207 runs through the watershed. The majority of the watershed is agricultural (cropland and pastureland). Wetlands occur along the riparian areas of Dog Branch in the northern part of the watershed.

4. Water Quality Standards/TMDL Targets

The waterbodies in the Dog Branch WBID are Class III Freshwater with a designated use of Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife. Designated use classifications are described in Florida's water quality standards. See Section 62-302.400, F.A.C. Water quality criteria for protection of all classes of waters are established in Section 62-302.530, F.A.C. Individual criteria should be considered in conjunction with other provisions in water quality standards, including Section 62-302.500 F.A.C., which established minimum criteria that apply to all waters unless alternative criteria are specified Section 62-302.530, F.A.C. Several of the WBIDs addressed in this report were listed due to elevated concentrations of chlorophyll *a*. While there is no water quality standard specifically for chlorophyll *a*, elevated levels of chlorophyll *a* are frequently associated with a violation of the narrative nutrient standard, which is described below.

4.1. Nutrients:

The designated use of Class III waters is recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. FDEP has not adopted a numeric nutrient criterion for Class III waters. Therefore, the Class III narrative criterion applies to Dog Branch:

> The discharge of nutrients shall continue to be limited as needed to prevent violations of other standards contained in this chapter. Man induced nutrient enrichment (total nitrogen and total phosphorus) shall be considered degradation in relation to the provisions of Section 62-302.300, 62-302.700, and 62-4.242, FAC. 62-302.530(48)(b), F.A.C.
>
> In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna. 62-302.530(48)(b), F.A.C.

Because the State of Florida does not have numeric criteria for nutrients, chlorophyll and DO levels are used to indicate whether nutrients are present in excessive amounts.

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4.2. Dissolved Oxygen Criteria:

Numeric criteria for DO are expressed in terms of minimum and daily average concentrations. Rule 62-302(30), F.A.C., sets out the water quality criterion for the protection of Class III freshwater waters as:

> Shall not be less than 5.0 mg/l. Normal daily and seasonal fluctuations above these levels shall be maintained.

4.3. Natural Conditions

In addition to the standards for nutrients, DO and BOD described above, Florida's standards include provisions that address waterbodies which do not meet the standards due to natural background conditions.

Florida's water quality standards provide a definition of natural background:

> "Natural Background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody or on historical pre-alteration data. 62-302.200(15), FAC.

Florida's water quality standards also provide that:

Pollution which causes or contributes to new violations of water quality standards or to continuation of existing violations is harmful to the waters of this State and shall not be allowed. Waters having water quality below the criteria established for them shall be protected and enhanced. However, the Department shall not strive to abate natural conditions. 62-302.300(15) FAC

5. Water Quality Assessment

2578 Dog Branch was listed as not attaining its designated uses on Florida's 1998 303(d) list for nutrients and dissolved oxygen.

To determine impairment an assessment of available data was conducted. The source for current ambient monitoring data for WBID 2578 Dog Branch was the Impaired Waters Rule (IWR) data Run 35.

5.1. Water Quality Data

The tables and figures below present the station locations and time series data for dissolved oxygen, total nitrogen, total phosphorus, and chlorophyll a observations for Dog Branch.

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5.1.1. 2578 Dog Branch

Table 1 provides a list of the water quality monitoring stations in the Dog Branch WBID including the date range of the observations and the number of observations.

Table 1 Water Quality Monitoring Stations for WBID 2578: Dog Branch

Station	Station Name	First Date	Last Date	No. Obs.
21FLA 20030559	DOG BRANCH AT SR 207	8/20/1997 10:25	12/13/2007 9:20	42
21FLSJWMDBR	Dog Branch 50 meters downstr County Rd 207 A	1/9/1996 14:40	6/5/2008 7:55	1000
21FLSJWMDBR2	Dog Branch 01 mile N of 207 @ old railroad bridge	2/6/1997 10:00	11/10/2005 10:30	277

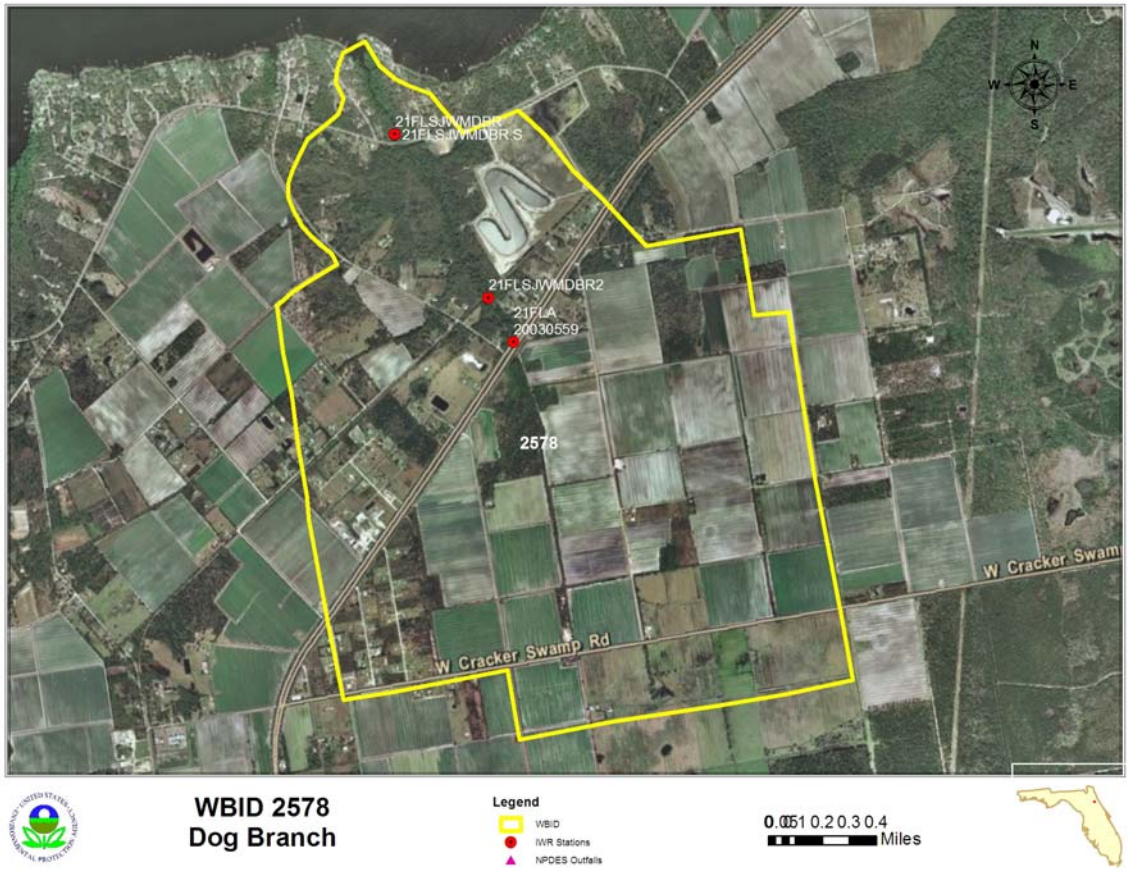

Figure 2 Station Locations for WBID: 2578 Dog Branch

Dissolved Oxygen

Figure 3 provides a time series plot for the measured dissolved oxygen concentrations in Dog Branch. There were 3 monitoring stations used in the assessment that included a total of 326 observations of which 156 (48%) fell below the water quality standard of 5 mg/l dissolved oxygen. The minimum value was 1.0 mg/l, the maximum was 11.7 mg/l and the average was 5.6 mg/l.

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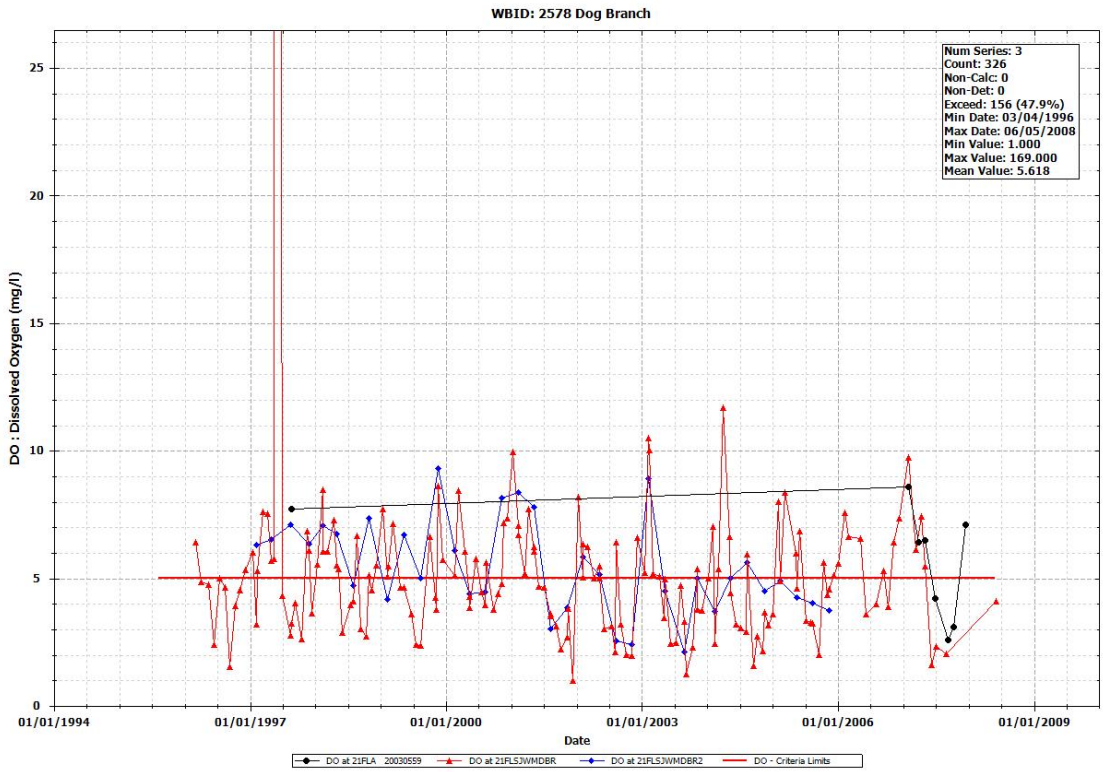

Figure 3 WBID: 2578 Dog Branch Measured Dissolved Oxygen

Biochemical Oxygen Demand

Figure 4 provides a time series plot for the measured BOD concentrations in Dog Branch. There were 3 monitoring stations used in the assessment that included a total of 102 observations. The minimum value was 0.4 mg/l, the maximum was 5.8 mg/l and the average was 1.62 mg/l.

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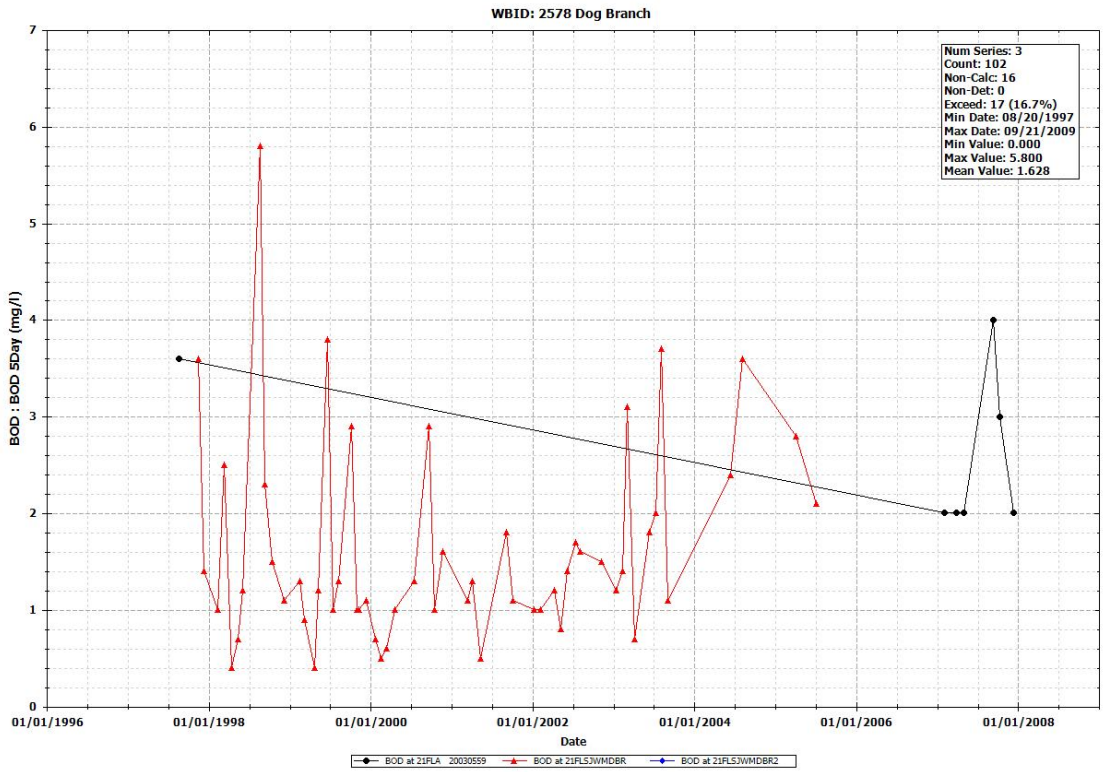

Figure 4 WBID: 2578 Dog Branch Measured BOD

Nutrients

For the nutrient assessment the monitoring data for total nitrogen, total phosphorus and chlorophyll a are presented. While Florida is currently working on the development and promulgation of numeric nutrient criteria, the current standards for nutrients are narrative criteria. The purpose of the nutrient assessment is to present the range, variability and average conditions for the WBID.

Total Nitrogen

Figure 5 provides a time series plot for the measured total nitrogen concentrations in Dog Branch. There were 3 monitoring stations used in the assessment that included a total of 323 observations. The minimum value was 0.227 mg/l, the maximum was 6.3 mg/l and the average was 1.74 mg/l.

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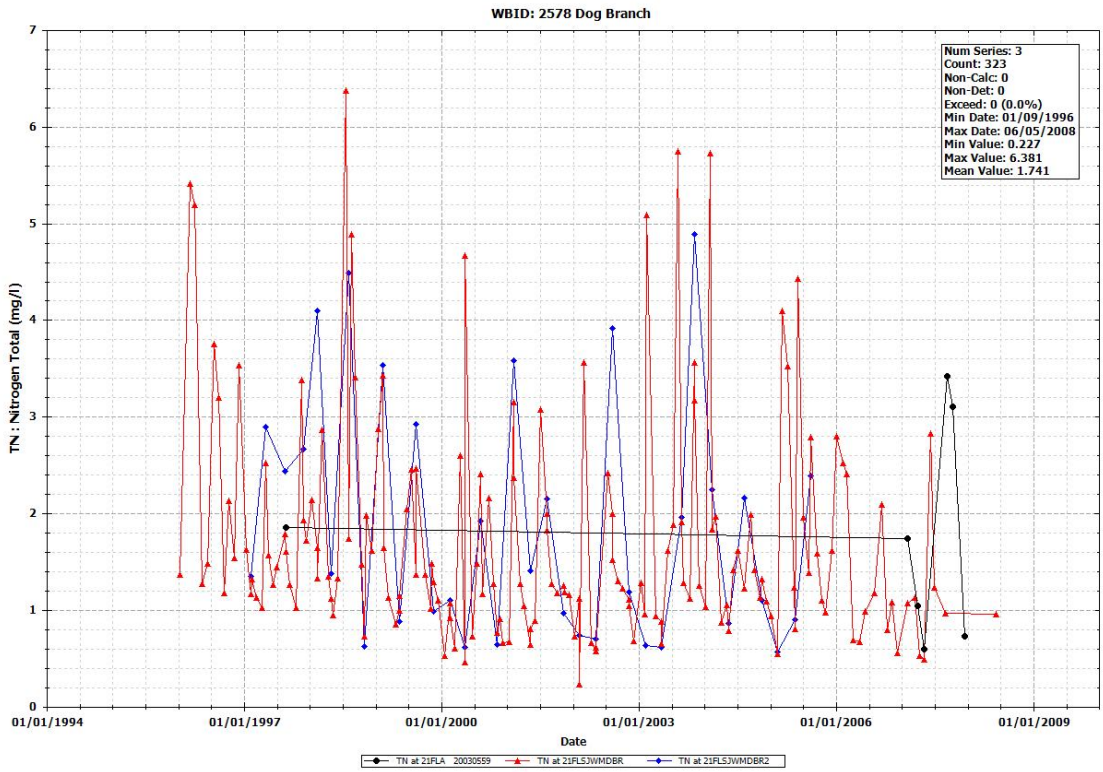

Figure 5 WBID: 2578 Dog Branch Measured Total Nitrogen

Total Phosphorus

Figure 6 provides a time series plot for the measured total phosphorus concentrations in Dog Branch. There were 3 monitoring stations used in the assessment that included a total of 333 observations. The minimum value was 0.076 mg/l, the maximum was 2.32 mg/l and the average was 0.372 mg/l.

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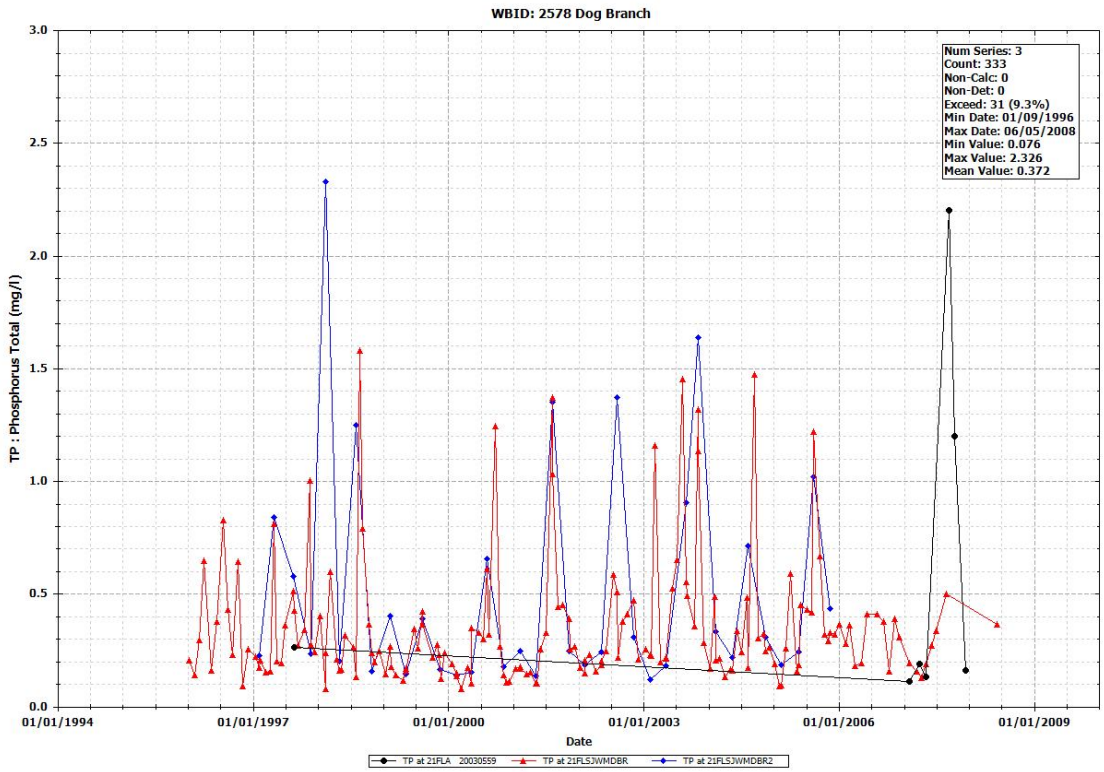

Figure 6 WBID: 2578 Dog Branch Measured Total Phosphorus

Chlorophyll a

Figure 7 provides a time series plot for corrected chlorophyll a concentrations in Dog Branch. There were 3 monitoring stations used in the assessment that included a total of 109 observations. The minimum value was 1.00 µg/l, the maximum was 54.6 µg/l and the average was 6.5 µg/l.

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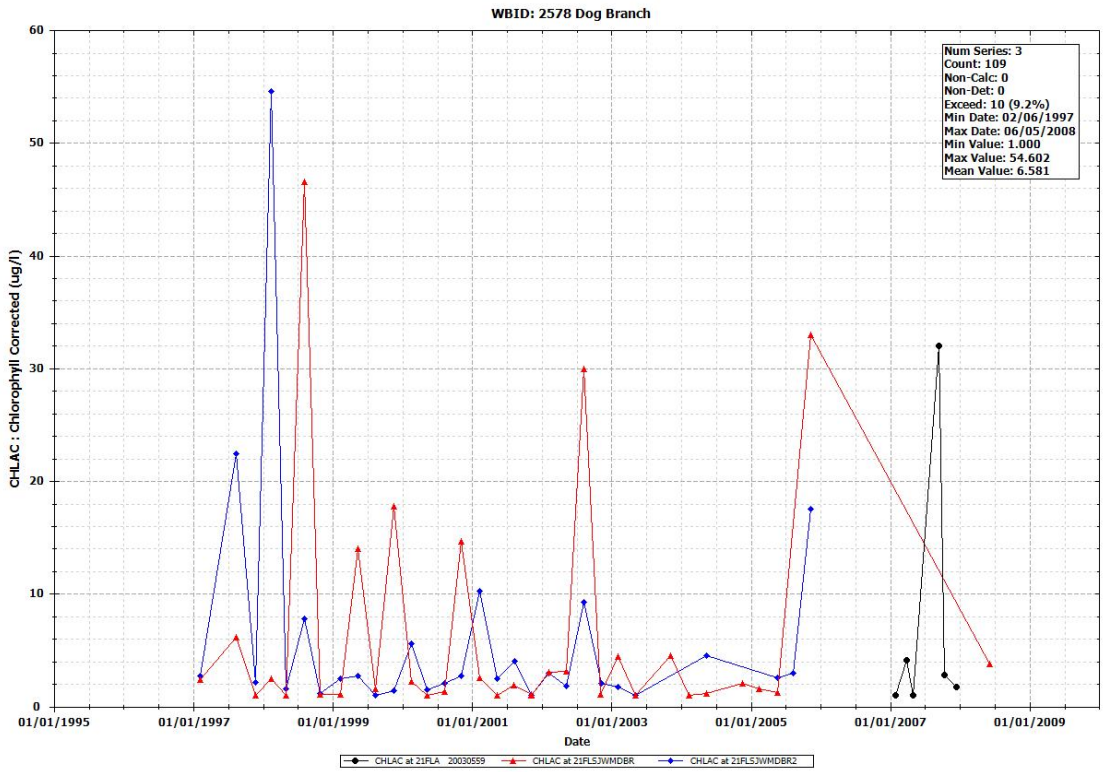

Figure 7 WBID: 2578 Dog Branch Measured Chlorophyll a Concentrations

6. Source and Load Assessment

An important part of the TMDL analysis is the identification of source categories, source subcategories, or individual sources of pollutants in the watershed and the amount of loading contributed by each of these sources. Sources are broadly classified as either point or nonpoint sources. Nutrients can enter surface waters from both point and 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 source discharges of industrial wastewater and treated sanitary wastewater must be authorized by National Pollutant Discharge Elimination System (NPDES) permits. NPDES permitted facilities, including certain urban stormwater discharges such as municipal separate stormwater systems (MS4 areas), certain industrial facilities, and construction sites over one acre, are stormwater driven sources considered "point sources" in this document.

Nonpoint sources of pollution are diffuse sources that cannot be identified as entering a waterbody through a discrete conveyance at a single location. For nutrients, these sources include runoff of agricultural fields, golf courses, and lawns, septic tanks, and residential developments outside of MS4 areas. Nonpoint sources generally, but not always, involve accumulation of nutrients on land surfaces and wash-off as a result of rainfall events.

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6.1. Point Sources

Point source facilities are permitted through the Clean Water Act National Pollutant Discharge Elimination System (NPDES) Program. There are no permitted point sources in the Dog Branch Watershed.

6.1.1. Municipal Separate Stormwater System Permits

Municipal Separate Stormwater Systems (MS4s) are point sources also regulated by the NPDES program. According to 40 CFR 122.26(b)(8), a municipal separate storm sewer (MS4) is "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

> (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law)...including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States.
>
> (ii) Designed or used for collecting or conveying storm water;
>
> (iii) Which is not a combined sewer; and
>
> (iv) Which is not part of a Publicly Owned Treatment Works."

Municipal Separate Storm Sewer Systems (MS4s) may discharge nutrients and other pollutants to waterbodies in response to storm events. In 1990, USEPA developed rules establishing Phase I of the National Pollutant Discharge Elimination System (NPDES) stormwater program, designed to prevent harmful pollutants from being washed by stormwater runoff into Municipal Separate Storm Sewer Systems (MS4s) (or from being dumped directly into the MS4) and then discharged from the MS4 into local waterbodies. Phase I of the program required operators of "medium" and "large" MS4s (those generally serving populations of 100,000 or greater) to implement a stormwater management program as a means to control polluted discharges from MS4s. Approved stormwater management programs for medium and large MS4s are required to address a variety of water quality related issues including roadway runoff management, municipal owned operations, hazardous waste treatment, etc.

Phase II of the rule extends coverage of the NPDES stormwater program to certain "small" MS4s. Small MS4s are defined as any MS4 that is not a medium or large MS4 covered by Phase I of the NPDES stormwater program. Only a select subset of small MS4s, referred to as "regulated small MS4s", requires an NPDES stormwater permit. Regulated small MS4s are defined as all small MS4s located in "urbanized areas" as

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defined by the Bureau of the Census, and those small MS4s located outside of "urbanized areas" that are designated by NPDES permitting authorities.

There are no permitted MS4s in the Dog Branch watershed.

6.2. Non Point Sources

Nonpoint source pollution generally involves a buildup of pollutants on the land surface that wash off during rain events and as such, represent contributions from diffuse sources, rather than from a defined outlet. Potential nonpoint sources are commonly identified, and their loads estimated, based on land cover data.

Table 2 provides the landuse distribution for the Dog Branch watershed which contains WBID: 2578. The latest landuse coverages were obtained from the Florida Department of the Environment (FDEP) FTP site. The landuses are described using the Florida Landuse Classification Code (FLUCC) Level 1. The predominant landuse draining directly to Dog Branch is agriculture (61%).

Table 2 Landuse Distribution in Dog Branch Watershed

Land Use Name	Area (ac)	Portion of Watershed (%)
AGRICULTURE	1464	61.58
BARREN LAND	12.8	0.54
RANGELAND	127.5	5.36
TRANSPORTATION, COMMUNICATION AND UTILITIES	53.4	2.25
UPLAND FORESTS	244.2	10.27
URBAN AND BUILT-UP	301.5	12.68
WATER	8.7	0.37
WETLANDS	165.3	6.95
Totals	2377.5	100

Figure 8 illustrates the landuses in the Dog Branch watershed.

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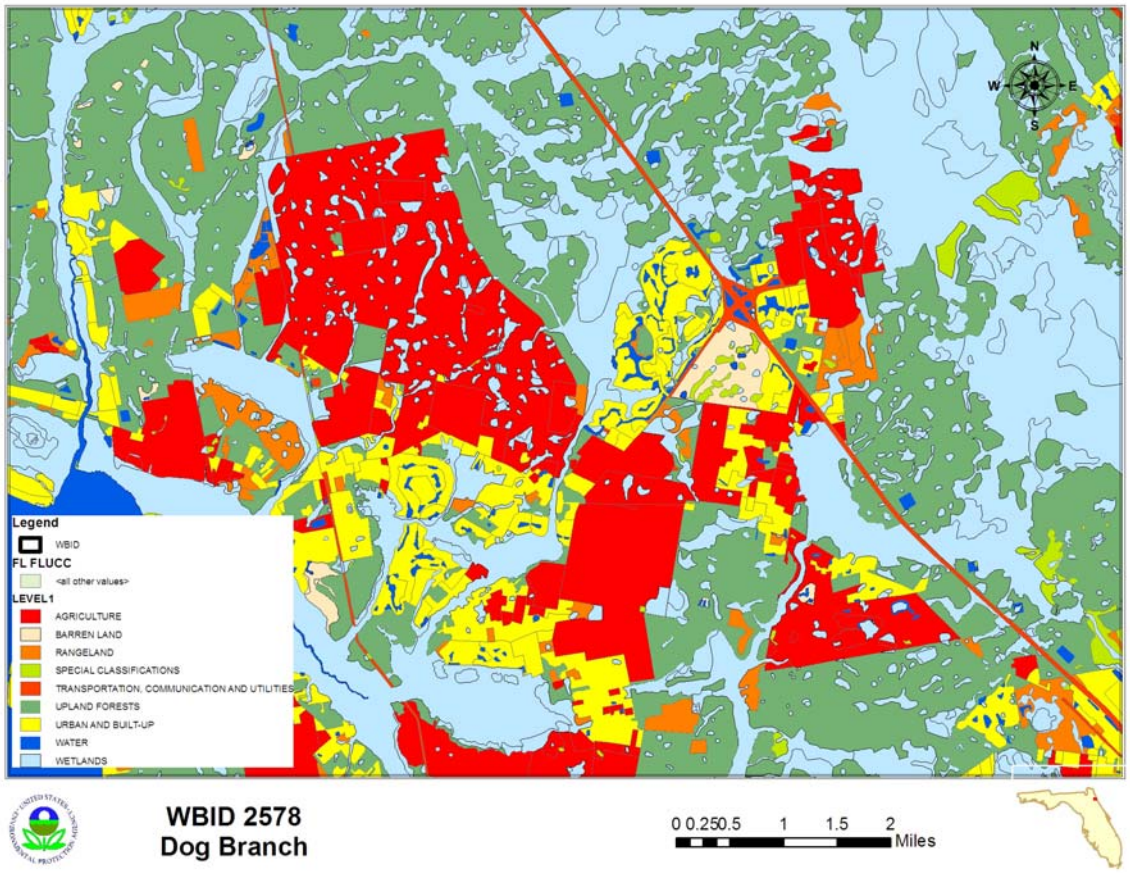

Figure 8 Dog Branch Landuse Distribution

6.2.1. Urban Areas

Urban areas include land uses such as residential, industrial, extractive and commercial. Land uses in this category typically have somewhat high total nitrogen event mean concentrations and average total phosphorus event mean concentrations. Nutrient loading from MS4 and non-MS4 urban areas is attributable to multiple sources including stormwater runoff, leaks and overflows from sanitary sewer systems, illicit discharges of sanitary waste, runoff from improper disposal of waste materials, leaking septic systems, and domestic animals.

In 1982, Florida became the first state in the country to implement statewide regulations to address the issue of nonpoint source pollution by requiring new development and redevelopment to treat stormwater before it is discharged. The Stormwater Rule, as outlined in Chapter 403 Florida Statutes (F.S.), was established as a technology-based program that relies upon the implementation of BMPs that are designed to achieve a specific level of treatment (i.e., performance standards) as set forth in Chapter 62-40, F.A.C.

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Florida's stormwater program is unique in having a performance standard for older stormwater systems that were built before the implementation of the Stormwater Rule in 1982. This rule states: "the pollutant loading from older stormwater management systems shall be reduced as needed to restore or maintain the beneficial uses of water" (Section 62-4-.432 (5)(c), F.A.C.).

Nonstructural and structural BMPs are an integral part of the State's stormwater programs. Nonstructural BMPs, often referred to as "source controls", are those that can be used to prevent the generation of nonpoint source pollutants or to limit their transport off-site. Typical nonstructural BMPs include public education, land use management, preservation of wetlands and floodplains, and minimization of impervious surfaces. Technology-based structural BMPs are used to mitigate the increased stormwater peak discharge rate, volume, and pollutant loadings that accompany urbanization.

6.2.2. Agriculture

Agricultural lands include improved and unimproved pasture, row and field crops, citrus, and specialty farms. The highest total nitrogen and total phosphorus event mean concentrations are associated with agricultural land uses.

6.2.3. Rangeland

Rangeland includes herbaceous, scrub, disturbed scrub and coastal scrub areas. Event mean concentrations for rangeland are about average for total nitrogen and low for total phosphorus.

6.2.4. Upland Forests

Upland forests include flatwoods, oak, various types of hardwoods, conifers and tree plantations. Event mean concentrations for upland forests are low for both total nitrogen and total phosphorus.

6.2.5. Water and Wetlands

These occur throughout the watershed and have very low event mean concentrations down to zero.

6.2.6. Barren Land

Barren land includes beaches, borrow pits, disturbed lands and fill areas. Barren lands comprise only a small portion of the watershed. Event mean concentrations for barren lands tend to be higher in total nitrogen.

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6.2.7. Transportation, Communications and Utilities

Transportation uses include airports, roads and railroads. Event mean concentrations for these types of uses are in the mid-range for total nitrogen and total phosphorus.

7. Analytical Approach

In the development of TMDL there needs to be a method for relating current loadings to the observed water quality problem. This relationship could be: statistical (regression for a cause and effect relationship), empirical (based on observations not necessarily from the waterbody in question) or mechanistic (physically and/or stochastically based) that inherently relate cause and effect using physical and biological relationships.

Because of time conflicts EPA was unable to model this waterbody. This waterbody is located in a basin that has been significantly modeled by EPA developing the TMDLs for 2009 proposal cycle. Therefore, EPA is using the targets that were developed during the modeling process of these other comparable TMDLs. EPA is taking comment on whether the use of these is appropriate for the establishment of this TMDL or additional waterbody specific analysis is necessary. Table 3 below shows the nutrient and BOD targets that were developed in the other modeling studies (US EPA, 2009).

Table 3 Nutrient and BOD Targets Developed in Previous TMDL Development

Basin	Total Nitrogen (mg/l)	Total Phosphorus (mg/l)	BOD (mg/l)
Pottsburg/Strawberry	0.70	0.050	2.60
Sixmile Creek	0.60	0.030	1.10
Black Creek	0.55	0.050	2.00
Econlockhatchee	0.72	0.076	2.30
Big Davis/Julington	0.80	0.056	2.20
Braden/Cedar	0.60	0.080	2.80
Sixmile Tampa	0.52	0.050	2.30
Alafia	0.90	0.600	1.20
Little Manatee	0.70	0.100	1.60
Sawgrass Lake	0.70	0.030	1.80
Jane Green/Crabgrass	0.80	0.044	1.10
Wolf Creek	0.53	0.030	1.15
Lake Poinsett	0.80	0.035	1.20
STJR above Lake George	0.80	0.039	1.50

Table 4 presents the nutrient and BOD targets that will be used in the development of this TMDL.

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Table 4 Nutrient and BOD Targets

Total Nitrogen (mg/l)	Total Phosphorus (mg/l)	BOD (mg/l)
0.69	0.09	1.78

8. TMDL Determination

A total maximum daily load (TMDL) for a given pollutant and waterbody is comprised of the sum of individual wasteload allocations (WLAs) for point sources, and load allocations (LAs) for both nonpoint sources and natural background levels. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. Conceptually, this definition is represented by the equation:

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

The TMDL is the total amount of pollutant that can be assimilated by the receiving waterbody and still achieve water quality standards and the waterbody's designated use. In TMDL development, allowable loadings from all pollutant sources that cumulatively amount to no more than the TMDL must be set and thereby provide the basis to establish water quality-based controls. These TMDLs are expressed as annual mass loads, since the approach used to determine the TMDL targets relied on annual loadings. The TMDLs targets were determined to be the conditions needed to restore and maintain a balanced aquatic system. Furthermore, it is important to consider nutrient loading over time, since nutrients can accumulate in waterbodies.

The TMDL was determined for the loadings coming from the upstream watershed and watershed that directly drains to Dog Branch. The allocations are given in Table 5. The MS4 service area is expected to reduce its loadings at the same percentage as the load allocation.

Table 5 TMDL Prescribed Reductions for Dog Branch (2578)

	Observed			Reference Modeled			LA & MS4		
WBID	Total Nitrogen (mg/l)	Total Phosphorus (mg/l)	BOD (mg/l)	Total Nitrogen (mg/l)	Total Phosphorus (mg/l)	BOD (mg/l)	% Reduction Total Nitrogen	% Reduction Total Phosphorus	% Reduction BOD
2589	1.74	0.30	1.90	0.69	0.09	1.78	60%	70%	7%

8.1. Critical Conditions and Seasonal Variation

USEPA regulations at 40 CFR 130.7(c)(1) require TMDLs to take into account critical conditions for stream flow, loading, and water quality parameters. The critical condition is the combination of environmental factors creating the "worst case" scenario of water quality conditions in the waterbody. By achieving the water quality standards at critical

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conditions, it is expected that water quality standards should be achieved during all other times. Seasonal variation must also be considered to ensure that water quality standards will be met during all seasons of the year, and that the TMDLs account for any seasonal change in flow or pollutant discharges, and any applicable water quality criteria or designated uses (such as swimming) that are expressed on a seasonal basis.

The critical condition for nonpoint source loadings is typically an extended dry period followed by a rainfall runoff event. During the dry weather period, nutrients build up on the land surface, and are washed off by rainfall. The critical condition for continuous point source loading typically occurs during periods of low stream flow when dilution is minimized. Although loading of nonpoint source pollutants contributing to a nutrient impairment may occur during a runoff event, the expression of that nutrient impairment is more likely to occur during warmer months, and at times when the waterbody is poorly flushed. The reductions are based on long term nutrient and BOD averages measured in the impaired WBID and the reference modeled WBIDs are based on long term simulation periods (seven years) seasonal and critical conditions are considered.

8.2. Margin of Safety

The Margin of Safety accounts for uncertainty in the relationship between a pollutant load and the resultant condition of the waterbody. There are two methods for incorporating a MOS into TMDLs (USEPA, 1991):

- Implicitly incorporate the MOS using conservative model assumptions to develop allocations
- Explicitly specify a portion of the total TMDL as the MOS and use the remainder for Allocations

This TMDL uses an implicit margin of safety as a TMDL targets for nutrients were set based upon multiple modeling scenarios.

8.3. Waste Load Allocations

Only MS4s and NPDES facilities discharging directly into lake segments (or upstream tributaries of those segments) are assigned a WLA. The WLAs, if applicable, are expressed separately for continuous discharge facilities (e.g., WWTPs) and MS4 areas, as the former discharges during all weather conditions whereas the later discharges in response to storm events.

8.3.1. NPDES Dischargers

There are no point source dischargers in the Dog Branch watershed, therefore there are no allocations specified.

For all continuously discharging facilities in the WBID they are expected to reduce their loading by the prescribed reduction in the waste load allocation.

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8.3.2. Municipal Separate Storm System Permits

The WLA for MS4s are expressed in terms of percent reductions equivalent to the reductions required for nonpoint sources. Given the available data, it is not possible to estimate loadings coming exclusively from the MS4 areas. Although the aggregate wasteload allocations for stormwater discharges are expressed in numeric form, i.e. percent reduction, based on the information available today, it is infeasible to calculate numeric WLAs for individual stormwater outfalls because discharges from these sources can be highly intermittent, are usually characterized by very high flows occurring over relatively short time intervals, and carry a variety of pollutants whose nature and extent varies according to geography and local land use. For example, municipal sources such as those covered by these TMDLs often include numerous individual outfalls spread over large areas. Water quality impacts, in turn, also depend on a wide range of factors, including the magnitude and duration of rainfall events, the time period between events, soil conditions, fraction of land that is impervious to rainfall, other land use activities, and the ratio of stormwater discharge to receiving water flow.

These TMDLs assume for the reasons stated above that it is infeasible to calculate numeric water quality-based effluent limitations for stormwater discharges. Therefore, in the absence of information presented to the permitting authority showing otherwise, these TMDLs assume that water quality-based effluent limitations for stormwater sources of nutrients derived from this TMDL can be expressed in narrative form (e.g., as best management practices), provided that: (1) the permitting authority explains in the permit fact sheet the reasons it expects the chosen BMPs to achieve the aggregate wasteload allocation for these stormwater discharges; and (2) the state will perform ambient water quality monitoring for nutrients for the purpose of determining whether the BMPs in fact are achieving such aggregate wasteload allocation.

The percent reduction calculated for nonpoint sources is assigned to the MS4 as loads from both sources typically occur in response to storm events. Permitted MS4s will be responsible for reducing only the loads associated with stormwater outfalls which it owns, manages, or otherwise has responsible control. MS4s are not responsible for reducing other nonpoint source loads within its jurisdiction. All future MS4s permitted in the area are automatically prescribed a WLA equivalent to the percent reduction assigned to the LA. Best management practices for the MS4 service should be developed to meet the percent reduction for both nitrogen and phosphorus as prescribed in Table 5.

8.4. Load Allocations

The load allocation for nonpoint sources was assigned a percent reduction from the current loadings coming into Dog Branch.

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9. References

Florida Administrative Code. Chapter 62-302, Surface Water Quality Standards.

Florida Administrative Code. Chapter 62-303, Identification of Impaired Surface Waters.

US EPA, Region 4, 2009. Proposed TMDL: WBIDs 2239 & 2265B Strawberry and Pottsburg Creek for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBID 2411 Sixmile Creek for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBIDs 2415B&C 2368 Black and Little Black Creek for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBIDs 2991A & 3001 Econlockhatchee and Little Econlockhatchee River for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBIDs 2351 & 2356 Big Davis and Julington Creek for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBIDs 1914 & 1926 Braden River and Cedar Creek for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBIDs 1536B & 1536F Six Mile Creek for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBID 1653 Alafia River for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBID 1790 Little Manatee River for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBID 28931 Sawgrass Lake for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBIDs 3073 & 3084 Jane Green and Crabgrass Creeks for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBID 3075 Wolf Creek for Nutrients and Dissolved Oxygen.

US EPA, Region 4, 2009. Proposed TMDL: WBIDs 2893I & 2893K Lake Poinsett and St. Johns River above Puzzle Lake for Nutrients and Dissolved Oxygen.

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US EPA, Region 4, 2009. Proposed TMDL: WBID 2893Z St. Johns River above Lake George for Nutrients and Dissolved Oxygen.

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