

Upper Wakulla River and Wakulla Springs Basin Management Action Plan

Proposed Monitoring Plan for Discussion

June 25, 2013

The following paper outlines the proposed monitoring plan for the Upper Wakulla River and Wakulla Springs Basin Management Action Plan (BMAP) to track trends in water quality and the biological community to measure progress towards the total maximum daily load (TMDL).

Objectives

The following objectives were drafted for discussion:

- Track trends in nitrate concentrations and loads in the Upper Wakulla River and Wakulla Springs.
- Track trends in the biological communities in the Upper Wakulla River.

River Monitoring

- *Existing* – The Northwest Florida Water Management District (NFWFMD) will continue to collect monthly samples at the upper bridge and field parameters at the boat dock. NFWFMD will continue with the continuous river level recorder and continuous pH, specific conductance, and temperature recorders.
- *Proposed* – NFWFMD will start collecting monthly water quality samples at the recreation area boat dock and water quality samples two times per year at the proposed biological sampling locations. The Florida Department of Environmental Protection will collect water quality samples two times per year at the proposed biological sampling locations.

Table 1: Water Quality Parameters for the River Monitoring Sites

Core Parameters	Supplemental Parameters	Field Parameters
Nitrate + Nitrite (as N)	Chlorophyll-a	Water Temperature
Ammonia (as N)	Total Organic Carbon	pH
Kjeldahl Nitrogen	Total Phosphorous	Specific Conductance
-	Chloride	Dissolved Oxygen
-	Sulfate	Sample Depth
-	Fluoride	Secchi Depth
-	Calcium	-
-	Magnesium	-
-	Sodium	-
-	Potassium	-
-	Alkalinity	-
-	Hardness	-
-	Turbidity (lab)	-
-	Specific conductance (lab)	-
-	Color (true)	-
-	Total Suspended Solids	-
-	Total Dissolved Solids	-

Spring Vent/Conduits Monitoring

- *Existing* –NFWFMD will continue to collect quarterly water samples at the spring vent. The Department's Ground Water Management Section will continue to collect quarterly water quality samples at the springs vent and six conduits, as conditions allow.

- Planned – The Department’s Ground Water Management Section will install a continuous Sauna Nitrate Meter at the spring vent.

Table 2: Water Quality Parameters for the Spring Vent/Conduits Monitoring Sites

Core Parameters	Supplemental Parameters	Field Parameters
Nitrate + Nitrite (as N)	Sucralose	Water Temperature
Ammonia (as N)	Nitrogen Isotopes	pH
Kjeldahl Nitrogen	Oxygen Isotopes	Specific Conductance
-	Total Phosphorous	Dissolved Oxygen
-	Ortho-Phosphate (as P)	Sample Depth
-	Organic Carbon	-
-	Dissolved Solids	-
-	Suspended Solids	-
-	Turbidity	-
-	Color (true)	-
-	Boron	-
-	Calcium	-
-	Magnesium	-
-	Sodium	-
-	Potassium	-
-	Chloride	-
-	Sulfate	-
-	Fluoride	-
-	Alkalinity	-

Biological Monitoring

- Types of monitoring:
 - Rapid periphyton survey (RPS) – assessment of the abundance and variety of algae in the river.
 - Linear vegetation survey (LVS) – assessment of the vegetation in the river to identify the native versus non-native species and plant density.
 - Stream condition index (SCI) – assessment of the number of different organisms present in the river.
 - Habitat assessment (HA) – assessment of the river conditions and habitat present to help support the SCI evaluation.
- Planned – Starting in October 2013, NFWFMD will conduct the RPS, LVS, SCI, and HA two times per year a half mile downstream and 200 meters downstream of the upper bridge. The Department will start to collect RPS, LVS, SCI, and HA an additional two times per year at the two biological sampling locations.

Flow Monitoring

- Existing – The U.S. Geological Survey (UGGS) will continue to maintain the flow gage at the upper bridge, which is funded by the Department. The Florida Geological Survey (FGS) will continue to maintain the flow gages in the conduits. NFWFMD will continue to maintain the gage in the spring vent, which include direction of flow, conductivity, temperature, and pressure
- Proposed – It is being proposed that the Department and funding partners re-establish the continuous flow gage at Spring Creek.



Figure 1: Proposed Monitoring Plan for the Upper Wakulla River and Wakulla Springs BMAP