



Water Quality Summary, Fiscal Year 2015

Overview

The Cumberland Piedmont Network (CUPN) began long-term monitoring of water quality at Little River Canyon National Preserve (LIRI) in fiscal year 2007 (October 2007 through September 2008). Sampling occurs monthly during two consecutive years, followed by five off years. Water quality is measured at 11 sites. Six sites are located along the main stem of Little River at Desoto Falls, Desoto State Park, Highway 35 Bridge, Eberhart Point, Billy's Ford, and Canyon Mouth, and five on tributaries, East and Middle Forks, Lookout Mountain Camp, Yellow and Johnnies Creeks. Based upon program requirements and specific park concerns, a set of parameters was chosen for long-term monitoring. Field measures are taken of water temperature, specific conductance (SpC), pH, and dissolved oxygen (DO). Samples undergo laboratory analysis for *Escherichia coli* (*E. coli*), turbidity, Acid Neutralizing Capacity (ANC), and nitrate.

This brief summarizes data collected from 1 October 2014 through 30 September 2015. Water quality data are available upon request to the Cumberland Piedmont Network or at our website: <http://science.nature.nps.gov/im/units/cupn/index.cfm>.



Figure 1. East Fork of Little River at Lookout Mountain Camp, 15 April 2015. Image by Shawn Waddell and Jason Hilley.

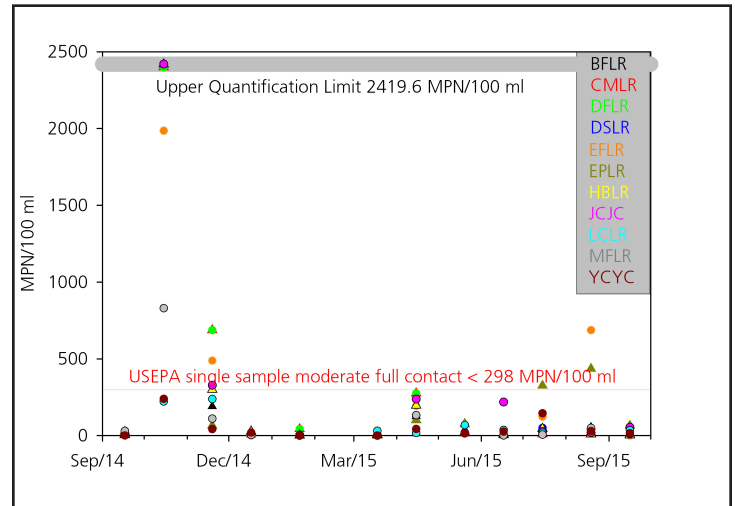


Figure 2. *Escherichia coli* at Little River Canyon National Preserve, FY14-FY15. Sites denoted as triangles are within the National Preserve, and circles are tributaries upstream of the preserve (BFLR—Billy's Ford Little River, CMLR—Little River at Canyon Mouth Park, DFLR—Little River at DeSoto Falls, DSLR—Little River at DeSoto State Park, EFLR—East Fork Little River, EPLR—Little River at Eberhart Point, HBLR—Little River at Highway 35 Bridge, JCJC—Johnnie's Creek, LCLR—Lookout Mountain Camp, MFLR—Middle Fork Little River, YCYC—Yellow Creek).

Significant Findings

Highlights of Fiscal Year 2015 Monitoring

There were 12 violations of the USEPA recommendations for *E. coli* and 61 apparent violations of Alabama's lower pH limit of 6.0 SU. High *E. coli* values occurred at nearly every site during high flows, which is indicative of non-point sources of bacteria. Low pH was observed at all sites. This low pH actually reflects the natural conditions of the Little River watershed. The local silica sandstone bedrock is basically devoid of carbonate minerals and thus provides no natural buffering, as surface water pH is very close to that of the precipitation. The state stipulates that a water body is not in violation if it reflects a natural condition. A single low DO observation of 5.3 mg/L was made on Middle Fork on 17 June 2015. The low DO measurement at Middle Fork was attributed to low flow.

Park Water in Good Condition

Overall, the water quality at Little River Canyon National Preserve is in good condition. During high flow events, park waters may exceed the standard for *E. coli*, but this is restricted to high flow conditions. All other parameters are within state water quality limits, although the DO at Canyon Mouth was at the lower limit during warm low flow on 19 August 2015. Low ANC makes streams of the preserve particularly vulnerable to acid precipitation.

Water Quality Standards

All Little River Canyon National Preserve waters are considered “Alabama Outstanding Resource Waters,” which hold the highest standards under the Clean Water Act as promulgated by the state. The single exception is the East Fork, located in Georgia, which falls under Georgia fish and wildlife standards. The states currently do not impose a standard for *Escherichia coli* bacteria, so we have adapted the EPA recommendations for “Full Contact Recreation.” The states are without a standard for nitrate (NO_3); the EPA limit for drinking water of 90 mg/L as NO_3 is used for comparison. Acid neutralizing capacity (ANC) and specific conductance (SpC) are without state standards or federal guidelines. These parameters are useful in interpreting water quality.

Parameter	Standard, Alabama	Standard, Georgia
Water Temperature	Less than 32.2°C	Less than 32.2°C
Dissolved Oxygen	Greater than 5.5 mg/L	Greater than 4.0 mg/L
pH	Between 6.0 and 8.5 SU	Between 6.0 and 8.5 SU
SpC ($\mu\text{S}/\text{cm}$)	No standard	No standard
ANC (mg/L CaCO_3)	No standard	No standard
<i>Escherichia coli</i>	Less than 298 MPN/100 mL	Less than 298 MPN/100 mL
Nitrate	Less than 90 mg/L as NO_3	Less than 90 mg/L as NO_3
Turbidity	Less than 50 NTU	No standard

Future Monitoring

Water quality sampling is scheduled to resume in fiscal year 2021.

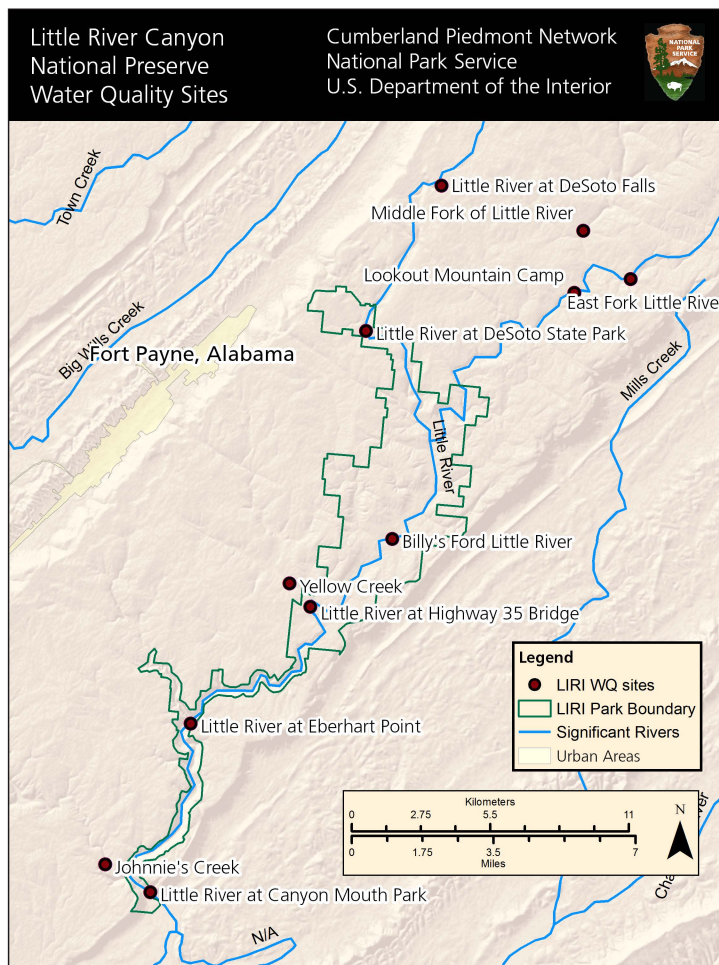


Figure 3. Map of Little River Canyon National Preserve water quality site locations.

About the Cumberland Piedmont Network

In 1999, the National Park Service initiated a long-term ecological monitoring program, known as “Vital Signs Monitoring,” to provide the minimum infrastructure to allow more than 270 national park system units to identify and implement long-term monitoring of their highest-priority measurements of resource condition. The overarching purpose of natural resource monitoring in parks is to develop scientifically sound information on the current status and long-term trends in the composition, structure, and function of park ecosystems, and to determine how well current management practices are sustaining those ecosystems.

The NPS Vital Signs Monitoring Program addresses five goals for all parks with significant natural resources:

- Determine the status and trends in selected indicators of the condition of park ecosystem,
- Provide early warning of abnormal conditions,
- Provide data to better understand the dynamic nature and condition of park ecosystems,
- Provide data to meet certain legal and Congressional mandates, and
- Provide a means of measuring progress towards performance goals.

Effective long-term management and stewardship of natural resources in the Cumberland Piedmont Network begins with baseline knowledge of these resources. To acquire this knowledge, an inventory program was established by the National Park Service with the goals of acquiring baseline information for a variety of resources, from bibliographic information to species occurrence and distribution.

For More Information

CUPN Home Page:

<http://science.nature.nps.gov/im/units/cupn/index.cfm>

CUPN Reports & Publications:

<http://science.nature.nps.gov/im/units/CUPN/publications.cfm>

About the NPS Inventory & Monitoring Program:

<http://science.nature.nps.gov/im/index.cfm>

Data Downloads via the Natural Resource Information Portal:

<http://irma.nps.gov>