

United States Department of the Interior – National Park Service – Buffalo National River. Arkansas Legislature Agriculture, Forestry, and Economic Development Joint Committee Meeting, March 29, 2016, Regarding ADEQ 2016 303(d) Impaired Waterbodies List.
Handout #2, Big Creek

Big Creek has a surface watershed of 83.5 square miles, and it is the fifth-largest tributary to the Buffalo River (Figure 1). During the summer of 2013, Natural Resources staff observed depressions in dissolved oxygen on Big Creek during weekly sampling. To get a better picture of the dissolved oxygen conditions, scientists installed a dissolved oxygen data collector in Big Creek on July 22, 2013 and ran it for 48 hours. Dissolved oxygen declined to below 6 mg/l during both nights, and remained below the critical level for more than 8 hours each night (Figure 2). NPS reported this information to ADEQ on August 6, 2013. In 2014, NPS contracted with USGS to install a stream gaging station on Big Creek. The station began monitoring dissolved oxygen at 15 minute intervals in June 2014. The gage showed substantial excursions below the critical level during the summers of 2014 and 2015 (Figure 3). In fact, during the summer of 2014, there were 33 nights when dissolved oxygen dropped below 6 mg/l for more than 8 consecutive hours, and 6 nights where dissolved oxygen dropped below 5 mg/l for longer than 8 consecutive hours. The dissolved oxygen reached a low of 4 mg/l which is far below the standard in APC&E Regulation 2.

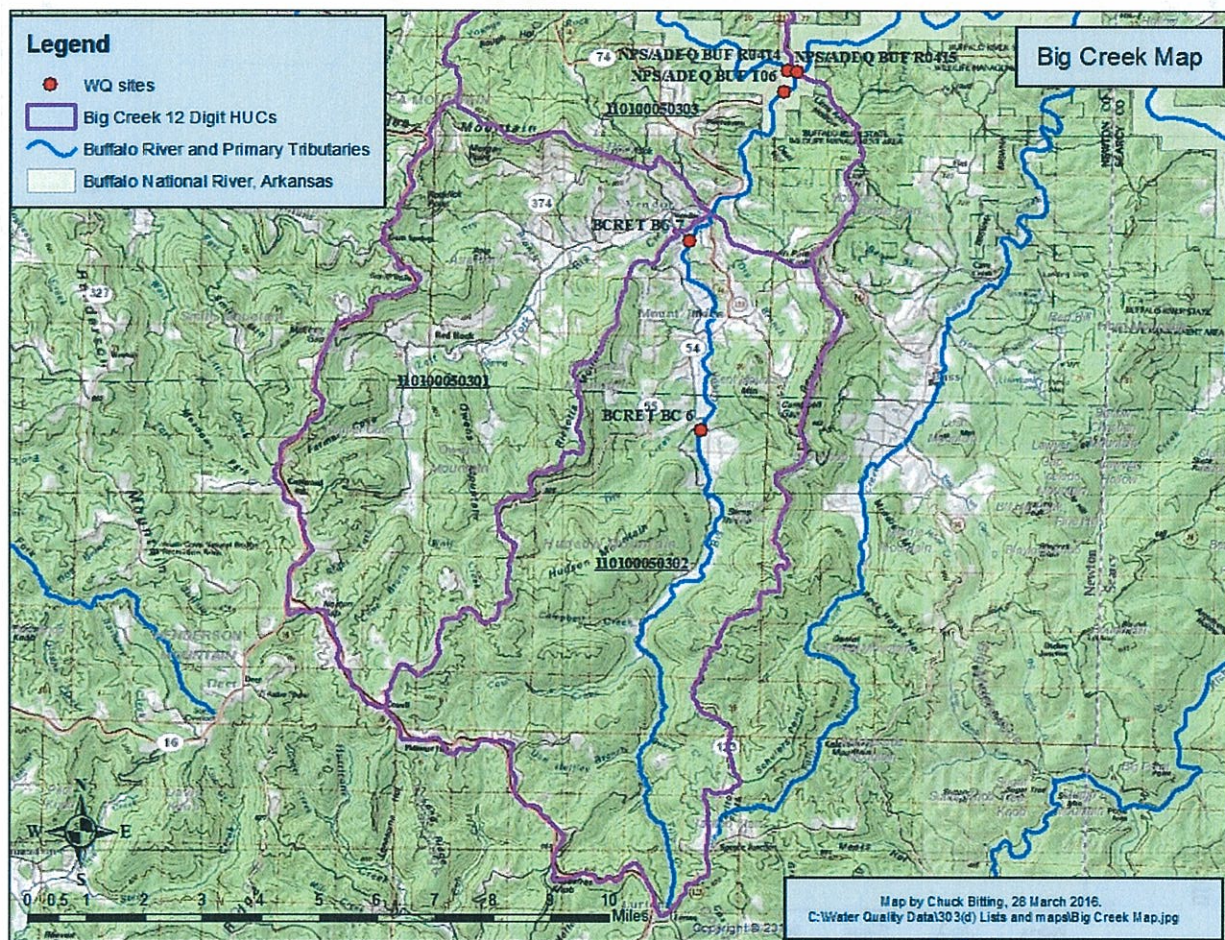


Figure 1: Map of Big Creek showing the 12 digit Hydrologic Unit Codes and water sampling stations.

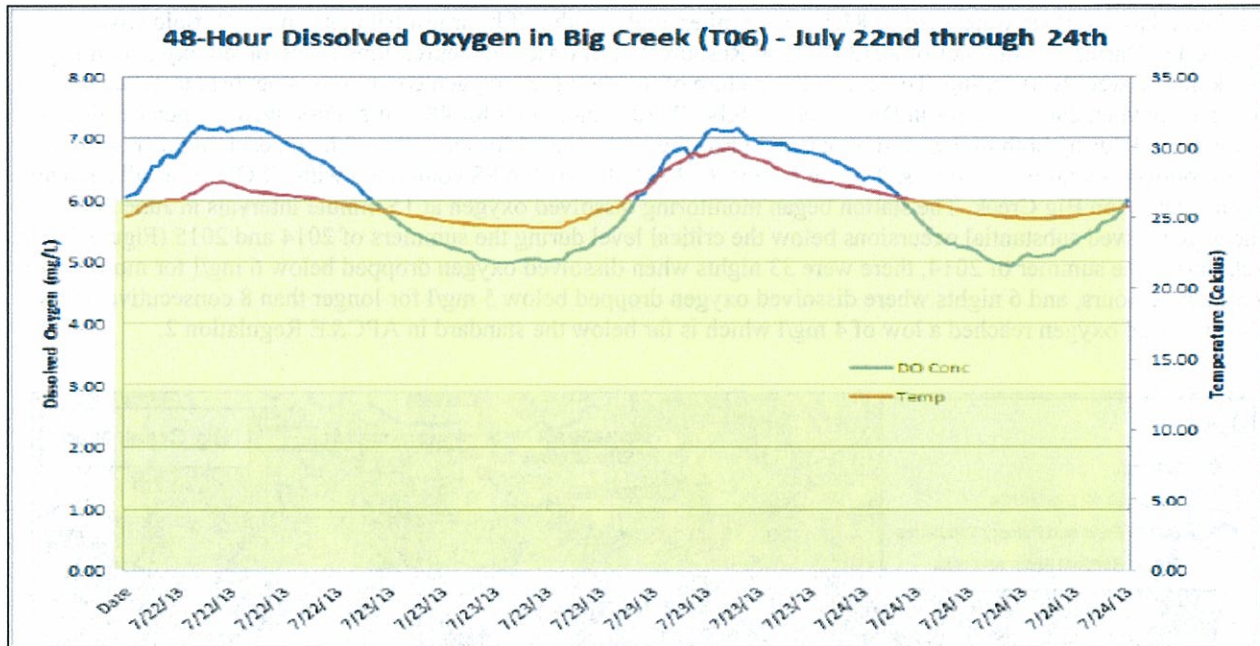


Figure 2: Dissolved Oxygen in Big Creek July 22-24, 2013. Yellow shaded box indicates critically low dissolved oxygen.

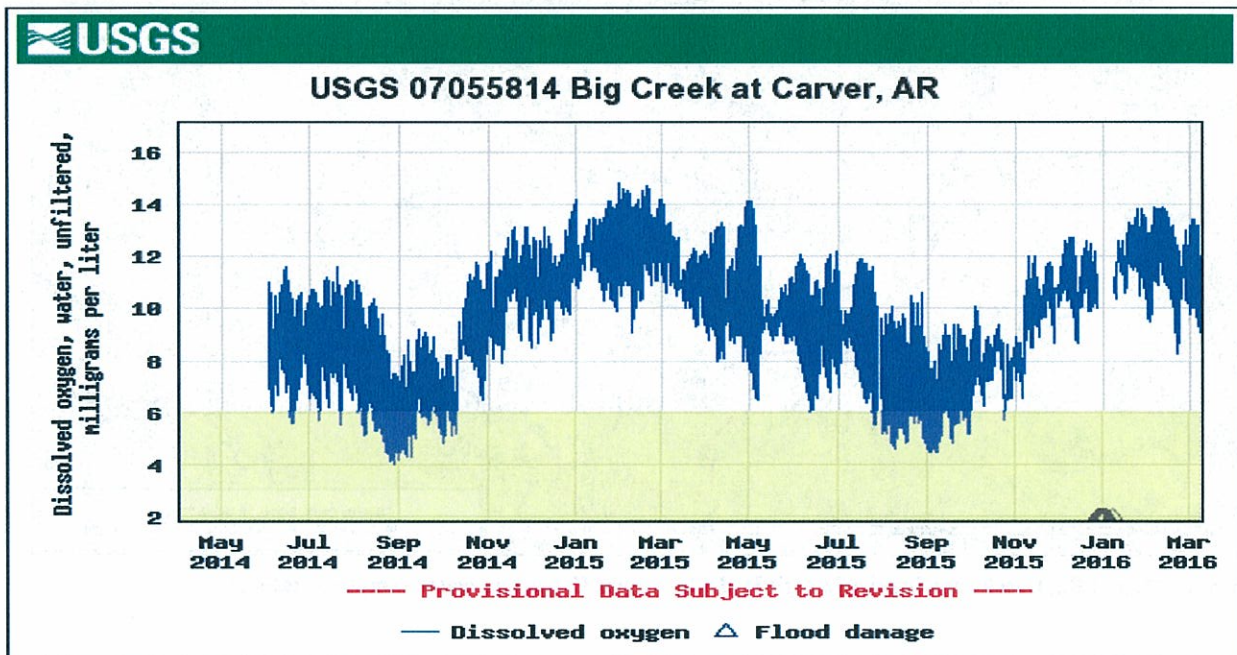


Figure 3: Dissolved oxygen data from Big Creek, June 2014 to March 2016. Yellow shaded box indicates critically low dissolved oxygen.

We also are concerned about bacterial contamination from Big Creek diminishing the water quality of the Buffalo River. Data shows impairment of Big Creek with respect to *E. coli*. We first began seeing this in the spring of 2014 (Figure 4). Big Creek Research and Extension Team (BCRET) data taken at two stations on Big Creek (BC 6 and

BC 7) shows that Big Creek was impaired for *E. coli* during the primary contact season of 2014. At Station BC 6, it appears the *E. coli* standard for individual samples was exceeded 36% of the time, and the geometric mean was exceeded in 3 of the 5 months. At Station BC 7, it appears the *E. coli* standard was exceeded 32% of the time, and the geometric mean was exceeded for 2 of the 5 months.

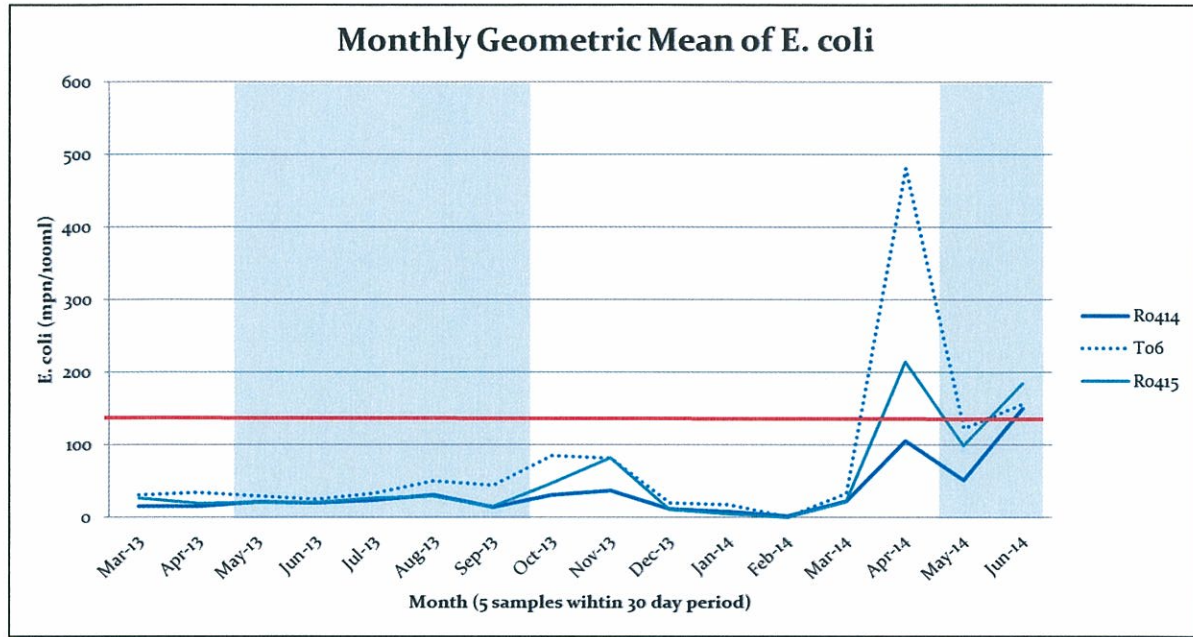


Figure 4: Water quality data for Big Creek (T06) and the Buffalo River (Upstream = R0414, Downstream = R0415) during spring and early summer of 2014. Blue shaded boxes indicate “Primary Contact Season”, the red line indicates the APC&E Regulation 2 geometric mean standard for *E. coli* of 126 col/100ml.

