



Black Creek Temperature Monitoring Summer 2010

Abstract

Black Creek is located in central Grays Harbor County, Water Resource Inventory Area (WRIA) 22. The creek flows westward to the Wynoochee River which is a major tributary to the Chehalis River. Black Creek is on Washington State's list of impaired waterbodies (303(d) list) for temperature and has been since 1998. The listing, identifying this reach of Black Creek as polluted (listing ID 7735), is the result of data collected by the Department of Ecology (Ecology) in 1990 after an adjacent clearcut. At that time Ecology found water temperatures exceeded the previous water quality standard of 18°C. The summer 2010 monitoring objective was to determine if water temperatures in Black Creek would meet the current water quality criterion, i.e. the 7-day average daily maximum temperature (7-DADMax) not to exceed 16°C for Core Summer Salmonid habitat.

Continuous temperature data from July – August 2010 found that neither the upstream nor the downstream site exceeded the 7-DADMax of 16 °C. The cooler water most likely resulted from the re-growth of riparian vegetative cover. As riparian cover continues to grow, it is expected that the water temperatures will continue to cool. It is recommended that Ecology conduct a second year of continuous temperature monitoring. If the water quality standard for temperature is met for two successive years in this reach of Black Creek, a request should be made through Ecology's Water Quality Assessment process to remove it from the 303(d) list.

Publication Information

This report is available on the Department of Ecology's website at www.ecy.wa.gov/biblio/1110033.html

Data for this project are available at Ecology's Environmental Information Management (EIM) website www.ecy.wa.gov/eim/index.htm. Search User Study ID BEDI0016

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Background

Black Creek is located in central Grays Harbor County, in Water Resource Inventory Area (WRIA) 22. The creek flows westward to the Wynoochee River which is a major tributary to the Chehalis River. Black Creek borders the north edge of the city of Montesano commercial forest, and meanders along the south boundary of Weyerhaeuser forestland. Black Creek is on Washington State's 303(d) list for temperature and has been since 1998. The listing, identifying this reach of Black Creek as polluted (listing ID 7735), is the result of data collected by Ecology in 1990 near an adjacent clearcut to the north. At that time Ecology found water temperatures exceeded the previous water quality standard of 18°C.

This 2010 study monitored current water temperatures to determine if temperatures in Black Creek would meet the Core Summer Salmonid Habitat water quality criterion of the 7-day average daily maximum temperature (7-DADMax) not to exceed 16°C. The same two earlier study sites, an upstream (BLKUP) and a downstream (BLKDN) location, were monitored for continuous temperature during the critical summer period of July through August 2010 (Figure 1). The Quality Assurance Project Plan for this study can be found in Ecology Publication No. 10-10-033 (Dickes, 2010).

Methods

Field sampling and measurement protocols followed those in Schuett-Hames, et al., 1999, and Ward, 2005. Continuous air and water temperature records were taken every 30 minutes with Onset® Tidbit v2 temperature loggers (temperature logger) from July through August 2010, to determine the highest 7-DADMax value.

Quality Control

The Onset® Tidbit v2 temperature loggers were calibrated before deployment and after recovery according to the Timber Fish and Wildlife stream temperature protocols (Schuett-Hames et al., 1999). A *National Institute of Standards and Technology* (NIST) certified reference thermometer was used for the calibration. Field sampling variation was addressed by field checks of the instruments with a NIST verified hand-held thermometer upon deployment and retrieval; the planned mid-season check was not conducted. Data met all quality control objectives.

Results

- The 7-DADMax temperatures did not exceed 16°C at either the upstream or downstream sites, but the daily maximum temperatures were as high as 15.9 °C (Figure 2).

Conclusions and Recommendations

- Both the upstream and downstream sites met the water quality criterion of the 7-DADMax not to exceed 16 °C for Core Salmonid Habitat.
- Continued growth of riparian vegetative cover should ensure that the water temperatures will remain below the criterion.
- Establishing mature riparian vegetation is key for attaining and maintaining stream temperatures that meet water quality standards.
- Protect riparian and aquatic habitat. This habitat is critical for achieving and maintaining cool water temperatures in Black Creek.

- Conduct a second year of continuous temperature monitoring during the critical summer season. If the water quality standard for temperature is met during the second year, a request should be made through Ecology's Water Quality Assessment process for removal of the reach from the 303(d) list.

References

Dickes, B., 2010. Quality Assurance Project Plan: Black Creek Temperature Monitoring. Washington State Department of Ecology, Olympia, WA. Publication No. 10-10-033
<http://www.ecy.wa.gov/biblio/1010033.html>

Rashin, E. and C. Graber, 1992. Effectiveness of Washington's Forest Practice Riparian Management Zone Regulations for Protection of Stream Temperature. Washington State Department of Ecology, Olympia, WA. <http://www.ecy.wa.gov/biblio/9264.html>

Ward, W., 2005. Continuous Temperature Sampling Protocols for the Environmental Monitoring and Trends Section. Washington State Department of Ecology, Environmental Assessment Program, Olympia, WA. 8 pp. + appendices. Publication No. 05-03-202.
www.ecy.wa.gov/biblio/0503202.html

Schuett-Hames, D., E. Pleus, E. Rashin, and J. Matthews, 1999. TFW Monitoring Program Method Manual for the Stream Temperature Survey. Prepared for the Washington State Dept. of Natural Resources under the Timber Fish and Wildlife Agreement, Olympia WA. TFW-AM9-99-005. DNR # 107. June. <http://www.ecy.wa.gov/biblio/99e01.html>

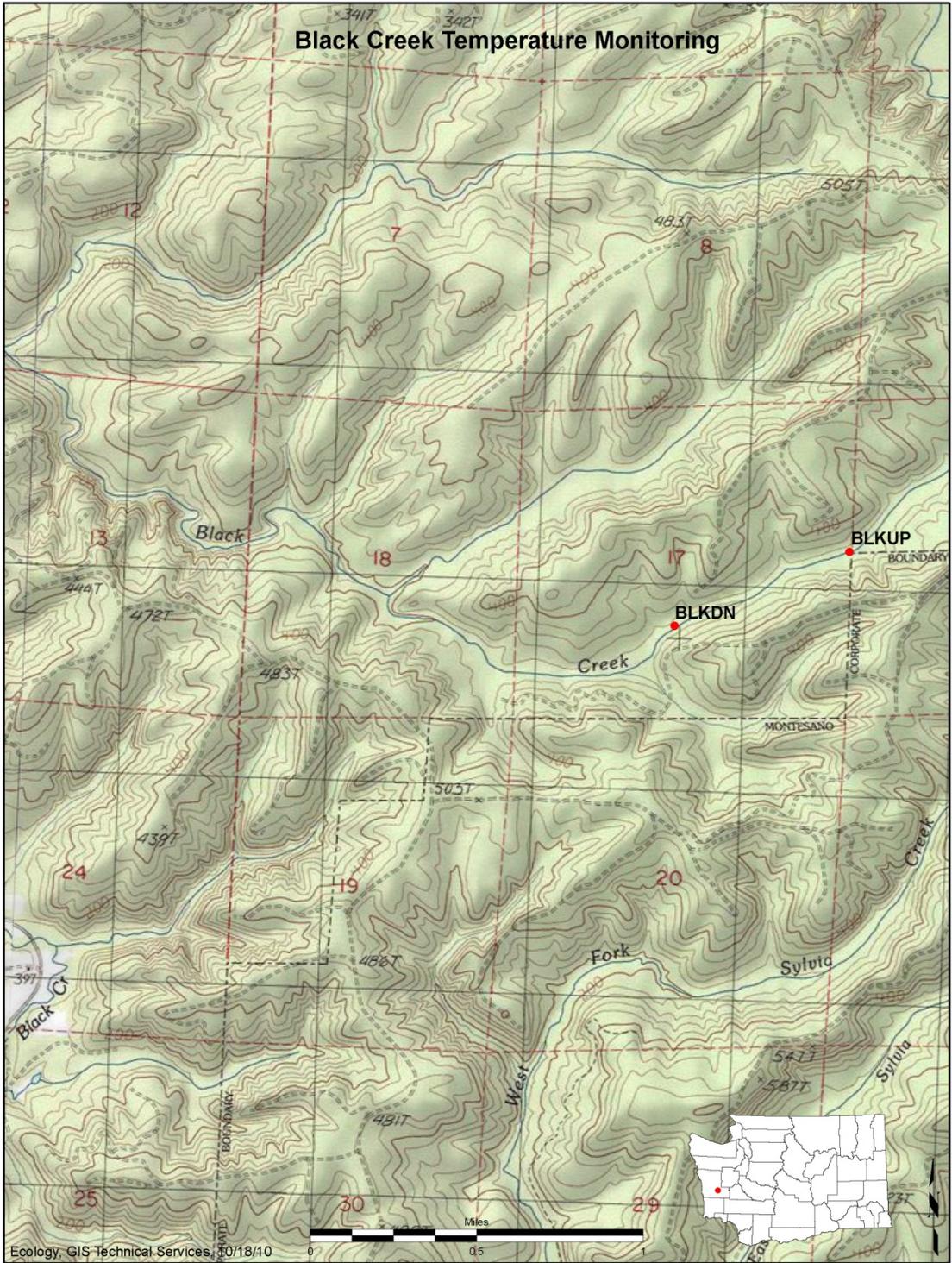


Figure 1. Location of the monitoring sites on Black Creek.

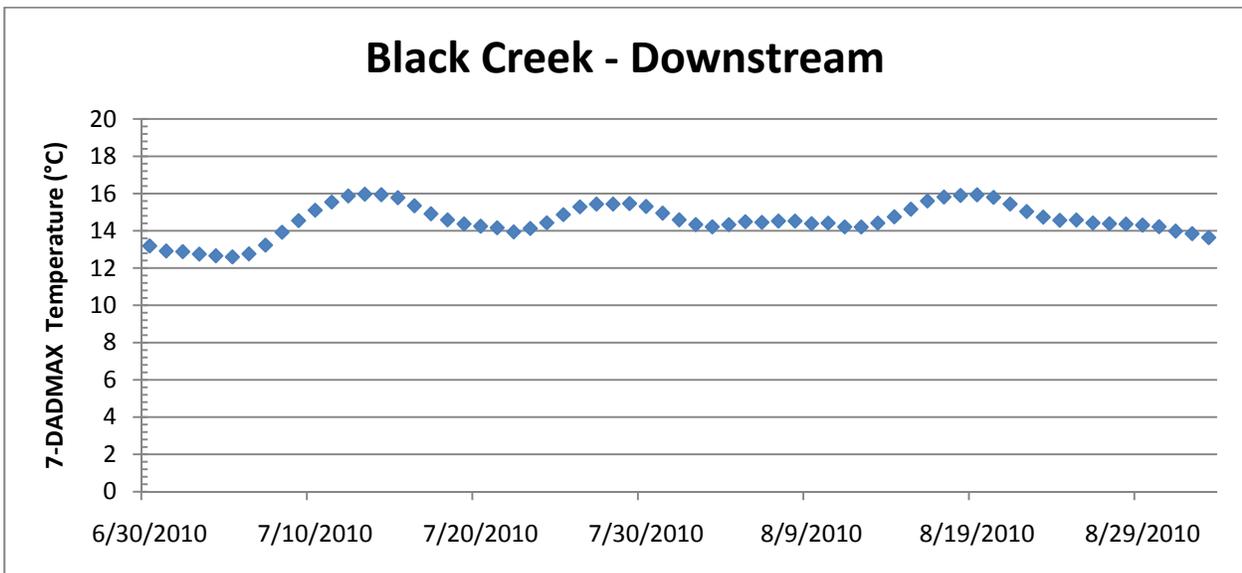
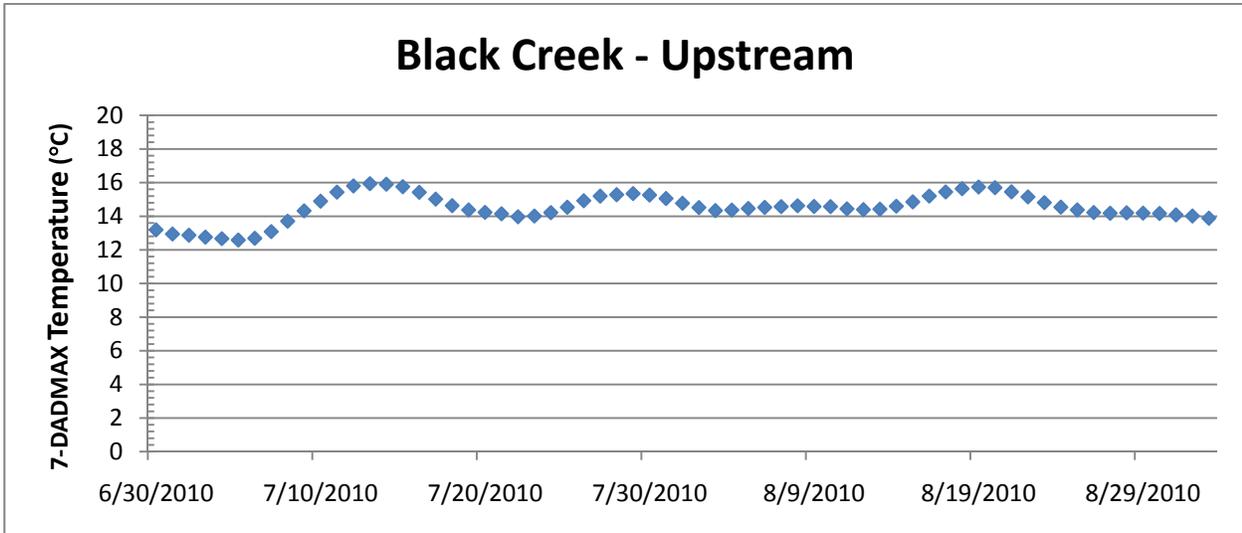


Figure 2. Black Creek temperature monitoring site data showing 7-day average daily maximum (7-DADMAX) temperature for the upstream and downstream sites in Black Creek. Washington State's water quality criterion requires that the 7-DADMAX not exceed 16°C.