

Project Completion Report Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU)

Project Title: Water resources monitoring - Bighorn Canyon NRA

Project Code: P13AC00242 under WASO Cooperative Agreement Number H2370094000

Type of Project : Technical Assistance

Funding Agency: National Park Service

Partner University: Montana State University

NPS Agreement Technical Representative (with complete contact information):

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Start Date of Project: April 1, 2013

End Date of Project: March 31, 2015

Funding Amount: \$9,020.00

Project Summary:

This task agreement enabled the Greater Yellowstone Network and Montana State University to measure discharge and water quality in Bighorn Canyon National Recreation Area during calendar year 2013. The project involved the 1) maintenance of continuous monitoring equipment installed at three locations in 2011, 2) development of rating curves for water table levels (a surrogate for discharge), and 3) collection of core water quality parameters and discharge and collection of samples for water chemistry at select rivers and streams in Bighorn Canyon. Results presented in the 2013 final report include annual and long-term discharge summaries for the Bighorn and Shoshone Rivers, chemical characters and discharge of monitored springs, and an evaluation of chemical and biological conditions of rivers and streams relative to state and federal water quality standards.

Deliverables:

Ray, A. M., K. Kaylor, and W. A. Sigler. 2015. Water quality summary for Bighorn Canyon National Recreation Area: Preliminary analysis of 2013 data. Natural Resource Data Series NPS/GRYN/ NRDS—2015/751. National Park Service, Fort Collins, Colorado. Available at: http://science.nature.nps.gov/im/units/gryn/monitor/water_resources.cfm

Ray, A.M. 2014. Changing Flows in Bighorn River: Summary of Water Years 1930-2013. Resource Brief. Available at: http://science.nature.nps.gov/im/units/gryn/monitor/water_resources.cfm

Ray, A.M. 2014. Layout Creek Discharge Monitoring. Brief provided to Bighorn Canyon National Recreation Area for interpretation. Unpublished.

Number of students participating in this project: One graduate student working on a PhD.

Lessons Learned from this project: We learned that the water depth and temperature loggers installed at Lockhart Stockpond Spring, Mason-Lovell Spring, Layout Spring, and Layout Creek continues to be an effective way to measure water depth. Using data collected as part of this agreement we were able to determine the less water is coming into Bighorn Lake since the 1930's and that since 2000, 10 years were below normal flow years.

Other RM-CESU agencies or research partners who participated in this project:

None