

Northern Colorado Plateau Network

Monitoring Brief

National Park Service
U.S. Department of the Interior

Intermountain Region
Inventory & Monitoring Program



2013

Big Rivers Monitoring

Importance

In several Northern Colorado Plateau Network (NCPN) national parks, big rivers and their associated riparian zones provide habitat for federally listed terrestrial and aquatic species, are intimately associated with unique geologic features cited in enabling legislation, and are major recreation destinations. As an increasing human population fuels increased demands for Colorado River water in states across the West, streamflow in virtually all rivers within the Colorado River drainage has been altered by water development projects. In most cases, peak flows have been reduced. Such reductions can result in channel narrowing, geomorphic simplification, and related losses of riparian structure and biological diversity (as habitat for aquatic organisms and riparian vegetation is depleted). In response to these concerns, the NCPN is implementing a big rivers monitoring program.

Long-term Monitoring

Building on past and present monitoring efforts, the NCPN has designed a hypothesis-driven, multi-scale monitoring protocol that links frequent, field-based rapid assessments; existing independent datasets; and infrequent, quantitative evaluations of broad-scale changes using remotely sensed data.

We hypothesize that with anticipated climate change and increasing human demands on regional water resources, streamflow regimes will shift in response to (1) more droughts and bigger floods and (2) more droughts and fewer, smaller floods because of water resource development. These shifts may lead to channel simplification through vegetation encroachment and stabilization of formerly active channel deposits and the creation of new floodplain surfaces by lateral and vertical deposition of alluvial sediments.

To test that hypothesis, we are:

1. Monitoring intensely at sentinel sites selected because they are sensitive to channel simplification,
2. Conducting rapid assessments of sites hypothesized to be very sensitive, sensitive, and insensitive to channel simplification, and
3. Conducting course-level monitoring using remote sensing to detect large-scale, riverwide changes.

Management Applications

Early detection and quantification of the channel simplification process would allow National Park Service managers to



Green River, Canyonlands National Park.

(1) negotiate with water users in the case of human-caused flow depletions and related channel narrowing, and (2) identify reaches sensitive to narrowing so that management actions might be implemented in a more efficient and cost-effective manner.

Status and Trends

In 2013, the NCPN fully implemented big rivers monitoring at Dinosaur NM, with sentinel sites along the Green and Yampa rivers; performed the second and third seasons of monitoring at the Red Rock Canyon and East Portal site at Black Canyon of the Gunnison NP; and conducted an interagency trip with Canyonlands NP management staff to select sentinel sites and install pressure transducers to measure next year's peak runoff at those sites. Due to cuts resulting from the federal budget sequester, big rivers monitoring was reduced in 2013. After soliciting and receiving feedback from park staff, the network decided to cancel sampling of big rivers at Curecanti NRA.

Contact

Dustin Perkins, dustin_w_perkins@nps.gov

Network park units where big rivers are monitored

Black Canyon of the Gunnison NP	Curecanti NRA
Canyonlands NP	Dinosaur NM

NP = National Park; NM = National Monument;
NRA = National Recreation Area