



Natural Resource Monitoring at Curecanti National Recreation Area



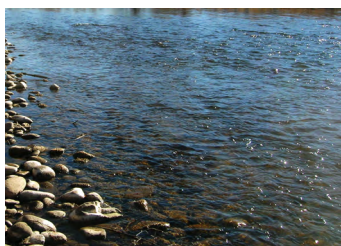
Blue Mesa Reservoir.

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The Northern Colorado Plateau Network

The Northern Colorado Plateau Network (NCPN) covers a geologically and biologically diverse region comprising 16 national parks in four western states. These parks contain desert grasslands, shrublands, forests, caves, large rivers, perennial streams, seeps, springs, and striking geology. Invasive species, trampling and grazing by livestock, and adjacent land-use activities are some of the most significant threats to NCPN parks. The NCPN is designing and implementing a long-term monitoring program to measure key indicators of ecological integrity, or “vital signs.” Multiple monitoring efforts will help inform managers of the health of park resources and provide early detection of potential problems. This brief describes recent NCPN activities at Curecanti National Recreation Area.

Aquatic Contaminants



Gunnison River.

NPS

In 2010, as part of a special project in cooperation with the Environmental Protection Agency (EPA), the NCPN sampled the Gunnison River and the Lake Fork of the Gunnison at Curecanti NRA for contaminants of emerging concern (those that have not traditionally been tested for during water quality sampling and may not be adequately cleansed by current wastewater treatment methods). Samples were analyzed at an EPA lab for evidence of pesticides and

wastewater indicators, including manufacturing byproducts and agricultural and human waste contaminants. Several analytes were detected at low levels at both sites. Triphenyl phosphate (multiple sources), the herbicide 2,4-D, and acetophenone (multiple sources) were detected in the Gunnison River and triethyl citrate (multiple sources) was detected in the Lake Fork. The network will publish final results from this work at a later date.

Flora Update



White fir.

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In 2008–2009, the NCPN published an annotated checklist of vascular plant species for each network park. Since that time, nearly 700 changes have been necessary to keep up with new research, due to the discovery of new species and changes to park status and existing nomenclature. For instance, 432 new vascular plant species have been added to the park floras

and the status of another 102 species has been changed. An [addendum to the original checklists](#), compiled by contractor Walt Fertig and published in 2012, details these changes. Curecanti NRA has seen an increase of 25 new plant taxa since 2007, an increase of 3.7% that brings the known and reported park flora to 704 taxa.

Invasive Exotic Plants



Yellow sweetclover.

Steve Dewey, USGS, Bugwood.org

Invasive exotic plants (IEPs) represent one of the most significant threats to natural resources in national parks. Exotic plants are able to reproduce prolifically, rapidly colonize new areas, displace native species, and alter ecosystem processes across multiple scales. However, if these invaders are discovered in their early stages, control efforts are likely to cost less and achieve higher success rates than after a species has become more widespread. In 2011, over 84 km were monitored along the shores of Blue Mesa Reservoir, along the South Rim Road, and along Deadhorse Trail at Black

Canyon of the Gunnison National Park and Curecanti NRA. Of 29 IEP species detected, 15 were priority species, accounting for 704 separate infestations. Canada thistle (*Brexa arvensis*), musk thistle (*Carduus nutans*), summer cypress (*Bassia sieversiana*), and Russian thistle (*Salsola australis*) were the most widespread species found along monitoring routes. A [full report](#) is available at the NCPN web site. Network staff will return to BLCA and CURE in 2012 to complete the initial rotation of invasive monitoring routes.

Uplands



Sagebrush.

NPS

NCPN uplands monitoring is intended to strike a balance between increasing fundamental understanding of these systems and providing managers with early warning of undesirable change. This protocol measures soil stability, hydrologic function, biological soil crusts, and plant community characteristics. Through discussions with park staff, aspen forests were selected for monitoring at Curecanti NRA and sagebrush shrublands were selected for monitoring across Curecanti NRA and adjacent

Black Canyon of the Gunnison NP. Monitoring began in 2008, the first of a three-year pilot study (2008–2010) to obtain an estimate of the variance in key parameters. The results of a power analysis performed on the three years of pilot data were used to create a full operational sampling design, implemented in 2011. In 2012, network staff completed the fifth year of monitoring at the park. [Annual reports](#) of upland monitoring are available at the network's web site.

Big Rivers



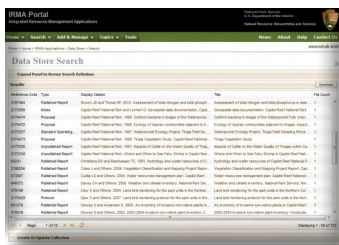
Measuring tree density.

NPS

Big rivers and their associated riparian zones provide habitat for terrestrial and aquatic species, are intimately associated with unique geologic features, and are major recreation destinations. As demands for Colorado River water increase, streamflow in virtually all rivers within its drainage has been altered by water development projects. In most cases, peak flows have been reduced, resulting in channel narrowing,

geomorphic simplification, and loss of riparian structure and related biological diversity. In response to these concerns, the NCPN is implementing a big rivers monitoring program at four network parks. Network staff initiated the first year of monitoring at the Cooper Ranch and Neversink area of Curecanti NRA in 2012. The big rivers protocol will be submitted for peer review in the winter of 2012–2013.

IRMA Data Store



Looking for something? The Integrated Resource Management Applications (IRMA) portal is your web-based “one-stop shop” for documents, data sets, and other types of NPS natural and cultural resource information. In 2011, the NCPN received funding from the national I&M Program to upload digital files to the [IRMA Data Store](#). Overall, a total of 370

digital files were uploaded. About half of those documents were already in digital form; the other half had to be scanned from hard-copy documents. Of the 370 documents uploaded, [76 were linked to Curecanti NRA](#). These documents covered topics including water quality, birds, and mammals.

Additional Efforts

In addition to the projects described in this brief, the NCPN also monitors air quality, landbirds, climate, water quality, riparian sys-

tems, landscape dynamics, and land surface phenology at Curecanti National Recreation Area.

For more information

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