



Natural Resource Monitoring at Hovenweep National Monument



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Hovenweep National Monument.

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 Hovenweep National Monument.

Aquatic Contaminants



Hackberry Pool.

In 2010, as part of a special project in cooperation with the Environmental Protection Agency (EPA), the NCPN sampled three water bodies at Hovenweep NM 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. Camphor (multiple sources) and 3-methyl indole (multiple sources) were detected in Cajon and Hackberry springs, with the herbicide Diuron surpassing a known level of biological concern at the latter site. Follow-up samples will determine if these analytes are persistent. Hackberry Spring will be re-sampled in 2012 and additionally tested for the presence of pharmaceuticals and personal care products. The network will publish final results from this work at a later date.

Springs and Seeps



Goodman Point Spring.

In cooperation with Southeast Utah Group staff, water quantity and quality monitoring continued at two spring sites in 2012, and other measures, including vegetation sampling, were initiated at these sites. The NCPN also completed a power analysis of pilot data and selected long-term monitoring locations for the proposed sampling design for springs monitoring. Results from a two-year study investigating the

effects of anthropogenic disturbance on aquatic macroinvertebrate communities and habitat quality across 40 impacted springs, including two springs at Hovenweep NM, are in press for the journal *Western North American Naturalist*. Data suggest that springs are resilient to—and perhaps even adapted to—moderate levels of disturbance, but there is a threshold beyond which negative impacts begin to accrue.

The overarching goal of NCPN climate monitoring is to compile and present climate data in a form that helps us to understand the reasons for trends seen in other network vital signs. The NCPN compiles and analyzes climate data from one weather station in Hovenweep NM. In 2011, mean annual maximum temperatures were slightly below average, while mean annual minimum temperatures were slightly above average at Hovenweep NM. As was true for many park units in the region, total precipitation and

Flora Update



Irony Rates

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. Hovenweep NM has seen an increase of five new plant taxa since 2007, an increase of 1.5% that brings the known and reported park flora to 345 taxa.

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, 43 were linked to Hovenweep NM. These documents covered topics including water quality, mammals, and invasive exotic plants.

Air_Quality

Big_Rivers

Climate

Field_Crews

Invasives

Land_Birds

Land_Condition

Land_Use_Cover

Macroinvertebrates

of strength for the NCPN, including databases, data distribution, quality assurance/quality control, and data management roles/responsibilities. The network will share its expertise in these areas with other networks as needed to help them make improvements. Two main areas needing improvement were also identified: data documentation and water quality data management. The NCPN will work with the national I&M Program and other networks to make improvements in these areas.

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