



Natural Resource Monitoring at Natural Bridges National Monument



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Sunset on Owachomo Bridge.

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 Natural Bridges National Monument.

Riparian Systems



Armstrong Canyon.

Integrated riparian monitoring involves the collection of biological and physical measures, such as riparian vegetation, non-native species invasions, streamflow, alluvial groundwater dynamics, and changes in channel form. Credible, efficient monitoring approaches will help the NCPN to assess riparian-system health and provide early warning of system degradation. Monitoring of Armstrong Canyon began in 2010 and has expanded each year since. To

date, four integrated monitoring reaches have been sampled for vegetation, and cross-sections of the channel and the location of the thalweg have been surveyed at three reaches. The proposed monitoring plan for Natural Bridges NM includes monitoring five reaches throughout the wash. NCPN staff are currently exploring options to monitor flood frequency and magnitude in the canyon.

Aquatic Contaminants



Owachomo Bridge Spring.

In 2010, as part of a special project in cooperation with the Environmental Protection Agency (EPA), the NCPN sampled waters in Armstrong Canyon and at Owachomo Bridge in Natural Bridges 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 cur-

rent 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. Bisphenol-A was detected at low concentrations in Armstrong Canyon. The network will publish final results from this work at a later date.

Landbirds



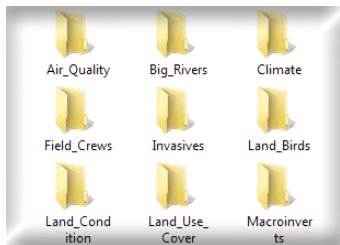
Bewick's wren.

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The NCPN is partnering with the Rocky Mountain Bird Observatory to assess breeding bird species trends in three habitats: riparian, pinyon-juniper, and sagebrush-shrubland. In 2011, the seventh year of monitoring was completed, including two transects in low-elevation riparian habitat and one transect in pinyon-juniper woodland at Natural Bridges NM, continuing the riparian bird monitoring conducted by park staff during 1993–2004. The second year of trend analyses was completed. Although populations for most species of con-

servation concern within the NCPN appeared to be stable, investigation of Bewick's wren populations in pinyon-juniper habitat is recommended, as RMBO has documented a decline of more than 50% in the last seven years for this bird. Potential explanations of Bewick's wren decline include loss of suitable nesting habitat and competition with other cavity nesters. Long-term monitoring will continue to be necessary for interpreting population status and trends for avian species of the NCPN.

Data Management Review



Data management is one of the NCPN's most pivotal tasks. In 2011, the network completed a review of its data management practices as part of a program-wide assessment facilitated by the national I&M Program. The goal of the review was to evaluate current practices and identify areas for improvement. In collaboration with network staff, the NCPN data manager completed a comprehensive self-assessment consisting of more than 200 questions spanning 12 categories. The review identified several areas

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.

Springs and Seeps



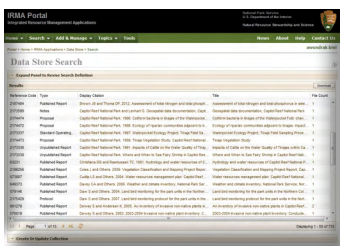
Kachina Spring.

NPS

In cooperation with Southeast Utah Group staff, springs monitoring was initiated at one site in 2012. Also in 2012, the NCPN 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 qual-

ity across 40 impacted springs, including three springs at Natural Bridges 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. Hanging garden monitoring methods will be tested in autumn 2012.

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, [63 were linked to Natural Bridges NM](#). These documents covered topics including hanging garden communities, rare plants, and water quality.

Additional Efforts

In addition to the projects described in this brief, the NCPN also monitors climate, water quality, landscape dynamics, and land surface

phenology at Natural Bridges National Monument.

For more information

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