



Natural Resource Monitoring at Pipe Spring National Monument



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Pipe Spring 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 Pipe Spring National Monument.

Aquatic Contaminants



Tunnel Spring.

In 2010, as part of a special project in cooperation with the Environmental Protection Agency (EPA), the NCPN sampled Tunnel Spring at Pipe Spring 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. Two analytes, neburon (herbicide) and tri(dichloroisopropyl) phosphate (TDCP flame retardant), were detected at low levels. The network will publish final results from this work at a later date.

Flora Update



Okra, one of many cultivated species in the park.

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. Pipe Spring NM has seen an increase of 56 new plant taxa since 2007, an increase of 19% that brings the known and reported park flora to 330 taxa.

Landbirds



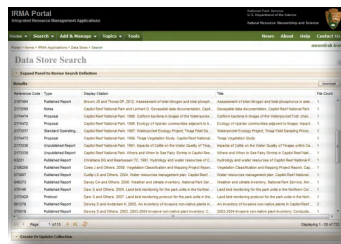
Black-throated gray warbler.

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Birds play an important role in the flow of energy through ecosystems and are sensitive to habitat changes, making them good indicators of habitat quality. The NCPN is partnering with the Rocky Mountain Bird Observatory (RMBO) to assess breeding bird species trends in three habitats across the network. At Pipe Spring NM, the NCPN adjusted existing protocols to fit the park's small size and the specific concerns of park managers. The methods employed by RMBO will enable park managers to follow bird trends as they change management practices, and be comparable to those used in the larger NCPN bird monitoring study.

In 2011, staff conducted four point counts two times each, as well as four area searches at Pipe Spring NM, detecting a total of 286 birds of 36 species. To date, 644 birds of 48 species have been detected. Likely due to the late migration season and the early date of the first survey visit, two species not previously detected in the park were found in 2011: black-throated gray warbler and sage thrasher. Long-term monitoring will continue to be necessary for interpreting population status and trends for avian species of the NCPN.

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, [40 were linked to Pipe Spring NM](#). These documents covered topics including water quality, springs, and birds.

Climate



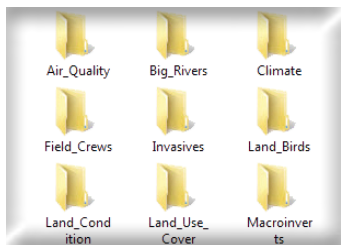
Weather station.

NPS

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 Pipe Spring NM. In 2011, mean annual maximum temperatures tended to be below average, while mean annual minimum temperatures were average to below average throughout much of the NCPN region, including at Pipe Spring NM. Although precipitation at the monument was lower than long-

term averages, snowfall was slightly above the historical mean. Most NCPN stations with long observation periods show a general increase in average annual minimum temperature over the past 30–50 years. There is evidence for a declining trend in snowfall from the 1980s to the mid-2000s; however, snowfall during many of the last few years was higher than the long-term average. A climate report will be produced by the NCPN and posted on the network's web site in 2012.

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.

For more information

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