



Natural Resource Monitoring at Dinosaur National Monument



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Dinosaur 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 Dinosaur National Monument.

Big Rivers



Gates of Lodore.

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 imple-

menting a big rivers monitoring program at four network parks. In collaboration with the U.S. Geological Survey and Utah State University, the network has completed a report outlining the protocol development progress and results from pilot study work. In 2012, we will conduct the third year of monitoring sentinel sites at Dinosaur NM and complete several rapid assessments on all three river reaches. The big rivers protocol will be submitted for peer review in the winter of 2012–2013.

Flora Update



Whorled milkweed.

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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. Dinosaur NM has seen an increase of 57 new plant taxa since 2007, an increase of 6.5% that brings the known and reported park flora to 812 taxa.

Aquatic Contaminants



Yampa River.

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In 2010, as part of a special project in cooperation with the Environmental Protection Agency (EPA), the NCPN sampled the Green and Yampa rivers at Dinosaur 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. The Yampa River contained the highest number of analytes detected at any location in the network,

with several analytes surpassing known levels of biological concern: 17-Beta estradiol (livestock feed supplement), 4-n-octylphenol (multiple sources), Bromacil (herbicide), caffeine, Carbaryl (insecticide), Chlorpyrifos (insecticide), Dichlorvos (insecticide), ethinyl estradiol (birth control), and triclosan (antimicrobial). Follow-up samples will determine if these analytes are persistent. The Yampa River 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.

Invasive Exotic Plants



Leagy spurge.

R. Old, XID Services, Inc., 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. During surveys conducted in July 2010 and 2011, NCPN staff detected 14 priority IEP species and 15

additional IEP species on monitoring routes and transects along 171 kilometers (727 hectares) of the Green and Yampa rivers. Tamarisk (*Tamarix chinensis*), broad-leaf pepperwort (*Lepidium latifolium*), and yellow sweetclover (*Melilotus officinalis*) were widespread along all three monitored sections (upper Green, lower Green, and Yampa) of the river corridor. Invasive species rates were generally higher along the upper Green River, followed by the lower Green River, and lowest on the Yampa River. A [full report](#) is available at the NCPN web site.

Uplands



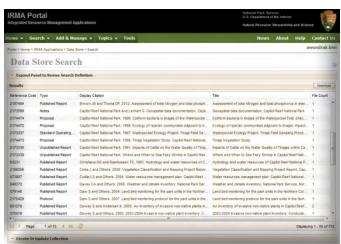
Sagebrush in Zenobia Basin.

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, and plant community characteristics. Sagebrush, grasslands, and, to a lesser extent, pinyon-juniper woodlands were selected for integrated uplands monitoring at

Dinosaur NM. Monitoring began in 2009, the first of a three-year pilot study (2009–2011) to obtain an estimate of the variance in key parameters. The network implemented a full-scale monitoring design based on the results of the pilot study in 2012. [Annual reports](#) of upland monitoring are available at the network's web site.

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, [68 were linked to Dinosaur NM](#). These documents covered topics including hanging garden communities, water quality, and birds.

For more information

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