



Natural Resource Monitoring at Hovenweep National Monument



Cutthroat Castle, Hovenweep National Monument/NPS

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 plants, 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.

Exotic Invasive Plants



Tamarisk
(U.S. Peterson/USDA-NRCS PLANTS database)

Exotic invasive plants represent one of the most significant threats to natural resources in national parks. Exotic plants are a concern because they are able to reproduce prolifically, rapidly colonize new areas, displace native species, and alter ecosystem processes across

multiple scales. To minimize costs and maximize the potential for eradication, it is critical to detect new populations of invasive species early. At Hovenweep NM, surveys will cover the places where exotic invasives are most likely to occur: roads, trails, and riparian corridors.

Species Lists



Tiger salamander/NPS

The NCPN has completed NPSpecies certification at Hovenweep NM for five taxonomic categories—birds, mammals, reptiles, amphibians, and vascular plants—and has posted the results on its website. An interactive application allows users to select a desired taxonomic category and an alphabetic sort function (i.e., by common name, scientific name, or family—scientific name). Additionally, users

can search by park, by status of the species in the park (e.g., present, historic, unconfirmed), and by individual species—allowing users to query, for example, does Hovenweep NM have a verified report of a tiger salamander? The resulting species list can be downloaded into an Excel spreadsheet for use by the public, park staff, or park cooperators.

Vegetation Mapping



Pinyon-juniper woodland/NPS

The NCPN is nearing completion on a multi-year, multi-partner effort to map vegetation at Hovenweep NM. This project has included gathering aerial photography, collecting initial vegetation-plot data, using the vegetation data to classify vegetation types and write vegetation descriptions, writing a dichotomous vegetation-type key, performing photo interpretation, collecting accuracy-assessment data, creating a geodatabase, and writing the

final report. These maps will be a valuable resource for use in park management, natural resource monitoring, interpretive programs, park planning, prescribed fire, and as a baseline for designing ecological studies. Potential uses could include estimating the number of acres of potential habitat for rare species, and fire-management assessments. The map is currently planned for completion in spring 2008.

Climate



Cajon Group/NPS

Climate plays a crucial role in regulating biological and physical processes; rainfall and temperature are the primary factors that limit an ecosystem's structure and function. The NCPN compiles and analyzes climate data from an existing weather station in Hovenweep NM. Over the past 49 years, Hovenweep

NM has shown an increase in average annual minimum and maximum temperatures—including record-high temperatures for January and February 2005—and a decrease in snowfall. Hovenweep NM climate data for the years 1957–2006 are available in an interactive, graphical format on the NCPN webpage.

Land Condition



MODIS satellite image of southern Utah
(USDA Forest Service)

Information on landscape-scale plant vigor and productivity (land condition) is key to understanding natural and human-caused ecosystem changes. Land-condition monitoring involves the use of MODIS (MODerate Resolution Imaging Spectroradiometer) satellite imagery. A measure of vegetation productivity, Normalized Difference Vegetation Index (NDVI), is calculated over time to estimate the

start and end of the growing season, the time of peak production, and seasonal productivity. This coarse-scale assessment of land condition can reveal important trends in the overall health of a park and surrounding ecosystem. A draft protocol for land-condition monitoring is scheduled to be complete in spring 2008, with monitoring to follow.

Land Cover and Land Use



Goodman Point/NPS

The composition, configuration, and connectivity of land-cover types determine habitat availability, energy and material flows, and the movement of organisms on a landscape. Large changes in landscape structure occur in response to natural and human-caused disturbances. Land-cover information will be estimated by maps derived from satellite imagery of park units and a surrounding >10-km buffer, on a four-year, rotating basis. Change, status, and trends in land cover will be as-

essed by comparing baseline maps to maps from the last monitoring period. These data will provide park managers with a baseline against which to assess future changes in landscape structure and composition; the ability to detect large-scale disturbances in remote areas; and information on land-use activities along park boundaries. A draft protocol for land cover and land use monitoring is scheduled to be complete in fall 2008, with monitoring to follow.

Future Projects

The NCPN will continue to expand ecological monitoring at Hovenweep NM. A protocol for monitoring human demographics is underway and planned for future implementation. The

network hopes to further expand ecological monitoring at Hovenweep NM through partnerships and cost-sharing opportunities.

For more information

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