



Natural Resource Monitoring at Curecanti National Recreation Area



Curecanti National Recreation Area (NPS/L. Lynch)

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 Curecanti National Recreation Area.

Landbirds



Northern harrier/©R. Bennetts

Birds play an important role in the flow of energy through ecosystems because they occupy various levels in the food web. Birds are also sensitive to habitat changes, which make 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: riparian, pinyon-juniper, and sagebrush-shrubland.

NCPN data will contribute to the RMBO's broader, landscape-scale, breeding-bird monitoring program. The network has monitored five plots in sagebrush shrublands at Curecanti NRA since 2005. The NCPN and RMBO will begin to look at trend data in 2009, after five years of data collection. The NCPN also completed a review of the park's existing bird monitoring program in 2007.

Vegetation Mapping



Vegetation-mapping plot/NPS

The NCPN is nearing completion on a multi-year, multi-partner effort to map the vegetation at Curecanti NRA. 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 interpre-

tation, 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.

Uplands



Sagebrush/NPS

Aspen woodlands, sagebrush, oak woodlands, and pinyon-juniper woodland vegetation types were selected for integrated upland monitoring, which includes measuring soil and site stability, hydrologic function, biotic integrity, and vegetation composition and structure. In cooperation with park staff, vegetation community types were visited in 2007 to determine which combinations of types to include in the monitoring effort. A three-year

pilot study designed to obtain an estimate of the variance in key parameters will begin in 2008. This information will be used to determine the number of plots necessary for long-term monitoring. Pilot sites were selected in a manner that ensures they will be incorporated into data analysis in the future, full-scale monitoring program. The NCPN also completed a review of the park's existing long-term vegetation monitoring program in 2007.

Water Quality



Dillon Pinnacles area/NPS

The NCPN provides support to the existing long-term water quality monitoring program in Curecanti NRA. These data are used to determine compliance with the Clean Water Act and state standards, and to assess trends over time. Additionally, they have demonstrated that Curecanti NRA's reservoirs and their tributaries may qualify for designation

as outstanding natural resource waters, which would preserve them at their current quality. The potential introduction of quagga and zebra mussels would pose a serious threat to park waters, dramatically affecting water quality, recreation, and the function of the reservoir system as a whole.

Species Lists



Bighorn sheep/NPS

The NCPN has completed NPSpecies certification at Curecanti NRA for six taxonomic categories—birds, mammals, reptiles, fish, 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 Curecanti NRA have a verified report of a bighorn sheep? The resulting species list can be downloaded into an Excel spreadsheet for use by the public, park staff, or park cooperators.

Climate



Rain gauge/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 Curecanti NRA. A record-high average minimum temperature was recorded in January and Febru-

ary 2005, while record-low mean maximum and minimum temperatures were recorded in December 2005. Snowfall has been below average at this station for the last nine years. Curecanti NRA climate data for the years 1967–2006 are available in an interactive, graphical format on the NCPN webpage.

Future Projects

The NCPN is continuing to expand ecological monitoring at Curecanti NRA. Protocols for monitoring aquatic macroinvertebrates; land condition; land cover and land use; integrated riparian communities; springs, seeps,

and hanging gardens; invasive exotic plants; and human demographics and development are underway and planned for future implementation.

For more information

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