



# Natural Resource Monitoring at Curecanti National Recreation Area



Curecanti National Recreation Area/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 Curecanti National Recreation Area.

## Flora Checklist



Sego lily.

Sheri Hagwood@USDA-NRCS PLANTS Database

In 2008, a revised checklist of the vascular flora of Curecanti NRA was completed. This entailed a thorough review of existing literature, re-examination of specimens from the Curecanti NRA herbarium and other state and national museum collections, and additional field work to corroborate unverified species reports and locate new species. Based on this study, 679 vascular plant taxa have been confirmed or reliably reported as occurring in the

park. Another 85 species formerly considered part of the park flora have now been shown to be falsely reported. Although no plant taxa are listed as threatened or endangered, at least 15 are considered species of concern by the state’s natural heritage program. Introduced plants make up 13% of the park flora (89 species), of which 23 species are considered noxious weeds by the State of Colorado.

## Water Quality



Electronic flow meter/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. Results have demonstrated that Curecanti NRA’s reservoirs and some tributaries have outstanding water quality. However, the

potential introduction of quagga and zebra mussels continues to pose a serious threat to the reservoirs. Occasional spikes in *E. coli* to levels that exceed water quality standards have been observed in six reservoir tributary streams since 2006. Manganese exceeded standards in two streams.

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## Landbirds



Juniper titmouse.  
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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. The network has monitored five plots in

sagebrush-shrubland at Curecanti NRA since 2005. The NCPN and RMBO will produce the first trend estimates for individual bird species after the 2009 field season, the fifth year of NCPN landbird monitoring. The goal is to be able to detect a population change of at least 3% within 30 years. We currently estimate that we will be able to do this for 52 species, representing more than 90% of all individual birds observed during 2005–2007.

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## Uplands



Uplands plot/NPS

Aspen forest, sagebrush shrubland, oak woodland, and pinyon-juniper woodland vegetation types were selected for integrated upland monitoring at Curecanti NRA and Black Canyon of the Gunnison NP, grouped together due to their proximity, joint management, and overlapping vegetation types. This protocol measures soil and site stability, hydrologic function, biotic integrity, and vegetation composition and structure. For all types except aspen (which has a small spatial extent

in both parks), a three-year pilot study to obtain estimates of variance for key parameters began in 2008. This information will be used to determine the number of plots necessary to detect trends for long-term monitoring. A total of 37 plots were established and monitored in 2008. These plots will be re-visited, and 16 new plots established, in 2009. Pilot sites were selected in a manner that ensures they will be included in the full-scale monitoring design.

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## Springs and Seeps



Soap Creek Spring/NPS

The primary goal for long-term monitoring of springs, seeps, and hanging gardens is to assess trends in key indicators of spring and seep ecosystem health. In 2008, the NCPN completed the first half of a two-year study investigating the effects of anthropogenic disturbance on aquatic macroinvertebrate communities and habitat quality across a range of

impacted springs. The study is being conducted at more than 30 springs in 6 NCPN parks, including 3 springs at Curecanti NRA. The information gathered will serve as the basis for selecting future core monitoring parameters and provide metrics for interpreting springs and seeps data.

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## Vegetation Mapping



Vegetation-mapping plot/NPS

The NCPN is nearing completion on a multi-year, multi-partner effort to map 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. The map is currently planned for completion in 2009.

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## Additional Efforts

A climate report, produced by the NCPN in 2008, is available on the network's web page. The NCPN is continuing to expand ecological monitoring at Curecanti NRA. Protocols

for monitoring land condition, land cover/land use, invasive plants, and riparian communities are underway and planned for future implementation.

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## For more information

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