Northern Colorado Plateau Network

Providing park managers with science for decisionmaking

National Park Service
U.S. Department of the Interior

Intermountain Region
Inventory & Monitoring Program

VITAL SIGNS *are a subset of physical, chemical, and biological elements and processes of park ecosystems selected to represent the overall health or condition of park resources.*

In 16 parks in four western states, the Northern Colorado Plateau Network is dedicated to providing park managers with the information they need to make sound, science-based decisions that will help support the National Park Service mission of preserving the resources of America's most special and treasured places for future generations.

Science for Management

Each day, National Park Service (NPS) managers make decisions with the potential to affect park resources for years to come. But in the past, many park managers lacked even baseline information about which resources were in the parks—let alone about the overall state of the ecosystem. This lack of reliable data often made informed decisionmaking difficult.

The NPS Natural Resource Inventory & Monitoring (I&M) Program was created by Congressional mandate in 1998, with the purpose of providing park managers with a broad-based understanding about the status and trends of natural resources to be used in management decisionmaking. Today, 32 I&M networks supply park managers with a stream of reliable scientific information about key park resources, known as "vital signs."

The Northern Colorado Plateau Network (NCPN) is one of those 32 networks. Our overall purpose is to develop scientifically sound information on the current status and long-term trends in the composition, structure, and function of park ecosystems, and to determine how well current management practices are sustaining those ecosystems. In short, during decisionmaking, the NCPN helps park managers turn "I don't know" into "Let's look at the reports."

NCPN Monitoring Program

Monitoring Protocol	Vital Sign(s)
Air Quality	Ozone Wet and dry deposition Visibility and particulate matter
Big Rivers	Riparian plant communities Surface water dynamics Fluvial geomorphology
Climate	Climate and weather
Invasive Exotic Plants	Early detection of invasive plants
Land Surface Phenology	Vegetation phenology Phenology and climate correlates Extent and duration of snow cover
Landbirds	Landbirds
Landscape Dynamics	Remotely sensed land-cover change
Seeps, Springs and Hanging Gardens	Seeps, springs, and hanging garden communities
Uplands	Native grasslands Shrublands Predominant plant communities Upland nutrient cycle Biological soil crusts Upland hydrologic function Upland soil/site stability
Wadeable Streams	Riparian plant communities Surface water dynamics Groundwater dynamics Stream/Wetland hydrologic function
Water Quality	Water chemistry

Science in Action

In cooperation with park staff, as well as staff from other federal and state agencies, non-profit organizations, and universities, the Northern Colorado Plateau Network (NCPN) collects, organizes, analyzes, and synthesizes natural resource data and provides the results in a variety of useful formats.

Park visitors and staff might see us shooting a laser at the ground, lowering a sensor into a stream, or counting the plants in a quadrat, among other activities. After field work is complete, our staff can be found at a computer, crunching numbers, then analyzing and reporting the results for use by park managers.

Moving in and out of parks for a week or a day at a time, the work of the NCPN largely takes place behind the scenes of everyday park management. However, the data collected by the NCPN can provide early warning of ecosystem changes, allowing park managers to develop effective mitigation measures and reduce management costs.

The NCPN collects data in strict accordance with a set of peer-reviewed protocols that describe what will be measured where, how, and how often. These protocols are also designed to ensure that changes detected by monitoring actually are occurring; that is, that they are not the result of different people or methods being used to collect the data. Most protocols address multiple vital signs.

We collect a lot of numbers. Storing those data so they are useful in the future is a significant part of what we do, but making it useful now is equally important. Reporting is done annually; full-scale analysis occurs on five- and ten-year cycles, because ecological change can be gradual. Network communications include briefs, data summaries, annual reports, and synthesis and trend reports. Our website provides access to these documents, along with GIS maps, analytical tools, and searchable databases for park species lists as well as climate and water-quality information.

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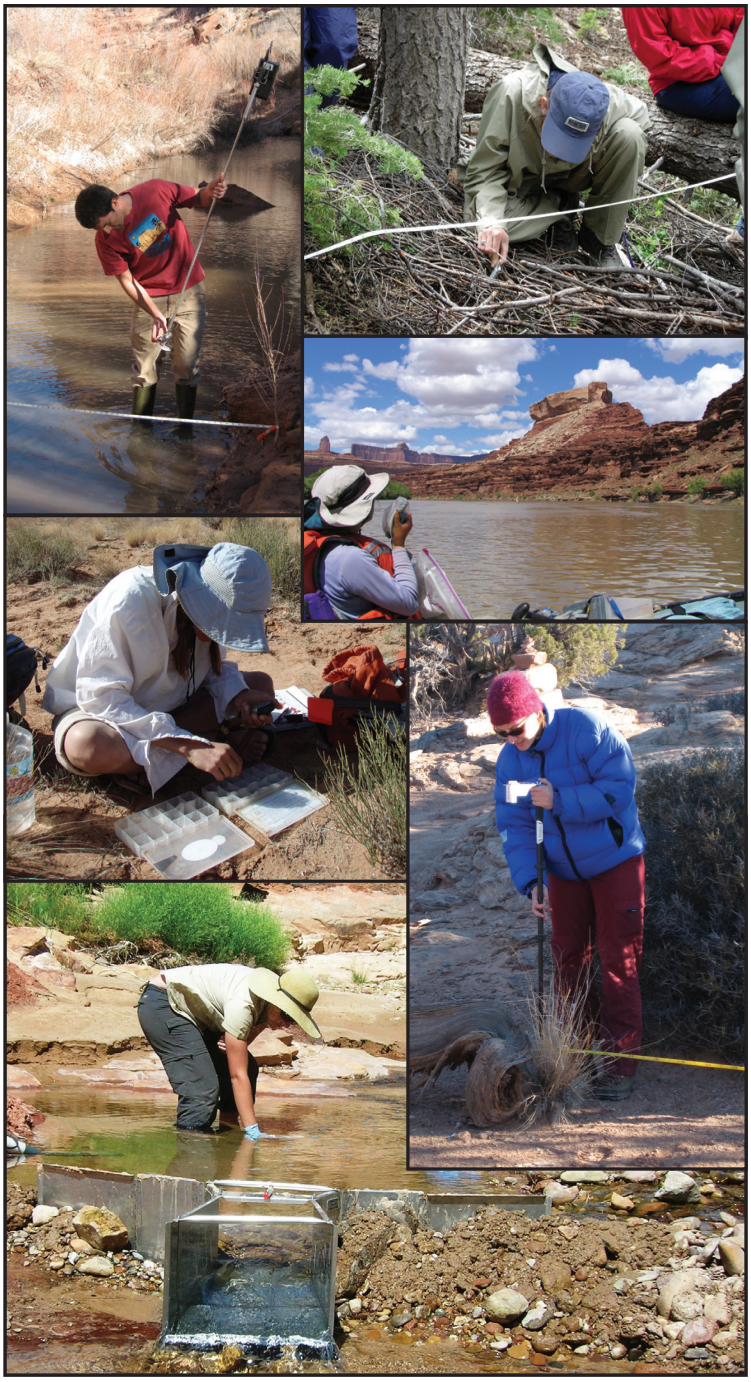
Network Parks

The NCPN consists of 16 parks with diverse cultural and natural resources distributed across four states and three physiographic regions. Ecosystems include desert grasslands, shrublands and woodlands, forested terrestrial systems, and aquatic systems, including large rivers, perennial streams, seeps, springs, and cave systems. Parks in the network range in size from 16 to more than 136,000 hectares, and include one national historic site, one national recreation area, eight national monuments, and six national parks.

Science in Use

Since the release of its monitoring plan in 2005, the NCPN has:

- Implemented monitoring on all 11 protocols and in all 16 network parks.
- Produced around 30 briefs and 20–50 reports, papers, posters, and presentations each year.
- Completed comprehensive vegetation mapping, classification, and distribution projects in all 16 network parks. These reports have been actively used during decisionmaking relative to management of wildlife, fire, and trails, and also been used for park goals reporting.
- Cooperated with State of Utah to determine the source of bacteria levels noted during NCPN sampling in Zion NP and devise solutions, including working with local landowners to improve water quality conditions.
- Produced weed mapping and monitoring reports that track trends and are used by park and Exotic Plant Management Team staff during planning for control efforts.
- Used satellite remote sensing data to analyze and report on 10 years of vegetation productivity along a north/south latitudinal gradient across the Colorado Plateau that appears correlated with monsoon storm tracks.



- Released several reports tracking landbird population trends in NCPN parks.
- Released a series of reports updating the flora for each network park, ensuring the reliability of park plant species lists.
- Cooperated with Zion NP and the Utah Division of Water Quality staff to facilitate the upgrade of protection status on the North Fork Virgin River from secondary contact (wading, fishing) to primary contact (swimming).

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