



Integrated Riparian Monitoring

2009

Importance

Riparian ecosystems are potentially sensitive indicators of landscape-level change because they are linked to both aquatic and upland systems, perform important ecological functions, and have high levels of biological diversity. Riparian systems face a number of anthropogenic threats, including damming or diversion of streamflow, channel-stabilization structures, invasive exotic species, livestock grazing, timber harvesting, agricultural clearing, groundwater pumping, and the creation of trails within riparian corridors. These disturbances can alter watershed conditions and thus indirectly influence downstream riparian ecosystems. Developing credible, efficient monitoring approaches will help in assessing riparian-system health and provide early warning of system degradation.

A field crew monitors riparian vegetation at Zion National Park.



NATIONAL PARK SERVICE

Long-term Monitoring

Integrated riparian monitoring involves the collection of both biological and physical measures. In conjunction with existing information (e.g., historical photos), repeat sampling of permanent transects will be used to track changes in the aerial coverage and species richness of riparian vegetation, including the rela-

tive abundance of native and non-native species. Integrated measures of physical drivers, including streamflow, alluvial groundwater dynamics, and changes in channel form, will be used to assess the extent to which observed changes are primarily the result of either inherent natural variability or anthropogenic stressors. Integrated riparian pilot monitoring began at Zion NP in the fall of 2007 and continued in 2008. Monitoring will begin at Capitol Reef NP and Natural Bridges NM in 2009.

Preliminary objectives of the integrated riparian monitoring protocol are to determine status and trends in:

1. The key physical drivers of riparian ecosystems
 - a) Surface and groundwater dynamics;
 - b) Geomorphic processes as reflected in channel and flood plain form;
 - c) Depth to alluvial groundwater; and
2. The composition, diversity, and structure of riparian vegetation.

Management Applications

The health of riparian systems is of high interest to park managers in the arid Colorado Plateau. Information gathered from this protocol will provide park managers with (1) a baseline against which to gauge the long-term status and trends of riparian resources relative to natural processes and anthropogenic stressors; and (2) information for evaluating the effectiveness of management interventions aimed at protecting or restoring these ecosystems.

Contact

Dana Witwicki,
Dana_Witwicki@nps.gov

Network park units where this monitoring will occur

Arches NP
Black Canyon of the Gunnison NP
Canyonlands NP
Capitol Reef NP
Curecanti NRA
Dinosaur NM
Natural Bridges NM
Zion NP

NP = National Park; NM = National Monument;
NRA = National Recreation Area

NATIONAL PARK SERVICE



Vegetation transect used for riparian monitoring at Zion National Park.