

Relict Vegetation Sites: Urgent Inventory Need for Desert Parks

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By Nicholas Van Pelt and Joel S. Tuhy

On the Colorado Plateau of Arizona, Utah and Colorado, an appreciable fraction of the land surface and its vegetation is in a pristine state. This results from the innumerable buttes and mesas so characteristic of this exceptionally scenic ecoregion. Most such terrain "islands", along with narrow canyons and steep, rocky slopes, are inaccessible to livestock, vehicles, and even humans. The plant communities of these "relict areas" have entirely escaped the influence of the major land uses of the Plateau: fossil-fuels extraction, hard-rock mining, firewood and post cutting, cattle grazing, and dispersed recreation.

The 13 national parks, monuments and recreation areas of the northern Colorado Plateau have their share of relict sites, but no verification of their existence and description of their features was undertaken until recently. Since 1986, The Nature Conservancy's Great Basin Field Office (GBFO) and the Rocky Mountain Region (RMR) have surveyed potential relict sites within NPS units in Utah and western Colorado. The first of two projects, requiring much helicopter time, yielded thorough descriptions of 22 sites within Glen Canyon NRA. The second phase involved all other units of the northern Plateau, from Zion in southwestern Utah to Curecanti in west-central Colorado. The more southerly units, in Arizona and New Mexico, have not yet been surveyed (University of Arizona scientists identified several sites within Grand Canyon in the late 1970s).

A Precious Resource

Almost all desert parks had sustained nonconforming uses before establishment. Several units, such as Capitol Reef, still support authorized grazing or cannot fully exclude trespass livestock. Accordingly, relict sites are a precious and limited resource, intrinsically valuable and useful for gauging departures from "naturalness" caused by grazing in particular. Today's inquisitive recreationists have sought out and affected a few sites, such as Canyonlands' Virginia Park.

Because relict areas are indeed remnants of pristine landscapes, and could be lost through park development, trespass, or inappropriate visitation, the Conservancy and the RMR felt that it was imperative to learn about and safeguard as many as possible. Some sites will contribute to state-based or plateau-wide Research Natural Area (RNA) networks maintained in concert with other federal agencies. Given Service-wide initiatives in climatic change monitoring and assessment, the relict sites afford secure places where monitoring equipment, sampling protocols, and photographic stations could be placed – with assurance that these will remain undisturbed. Most importantly, the sources of vegetational and faunal changes over the coming decades will not be confounded with influences present elsewhere in the same parks.

74 Catalogued Sites

The 74 sites visited and catalogued range in size from five to several thousand hectares. The largest and therefore most diverse of them occur in Canyonlands, Glen Canyon and Zion. The vegetation present

ranges from blackbrush (*Coleogyne*) semidesert shrubland through a great variety of pinyon-juniper (*Pinus edulis-Juniperus osteosperma*) woodland subtypes to montane or subalpine ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*) and Engelmann spruce (*Picea engelmannii*) habitat types. Four bristlecone pine (*Pinus longaeva*) forests, all with endemic plant concentrations, were surveyed. One, comprising the only montane forest area in Capitol Reef, will receive its first dendrochronological evaluation this year by the Laboratory of Tree-Ring Research.

Following completion of the Glen Canyon phase, the Conservancy compiled a master vegetation classification for the Colorado Plateau. The units in the forest, woodland, shrubland, grassland and "other herbland" series included were used as a checklist in the surveys, which turned up additional types. However, the sites do not constitute full samples of the vegetal types present in any of the parks, with the exception of Glen Canyon. There, it is possible for resource managers to revisit and intensively characterize pristine examples of nearly all rangeland communities affected by the NRA's grazing program.

Photo Stations Installed

A key adjunct of the largely qualitative surveys was the installation of permanent, unobtrusive photographic stations. Surveyors acquired 50- to 400-mm color slide panoramas with a professional camera and tripod set up at measured distances above the station nadirs. The resulting pictures afford a vivid and repeatable record of vegetation and surfacial features. Trees and shrubs are frequently identifiable, making some of the 740 images useful for long-term, individual-plant-based studies. The photographs are archived in three final-report volumes (one each for southwestern/south-central Utah, western Colorado, and Canyonlands). Directions for rephotographing the scenes (perhaps in 10 years) are included. The project has therefore substantially augmented the collective portfolio of

desert landscape photographs that can be reliably matched in the future. They can be used to complement more specialized, data-based resource monitoring and research efforts. In the 1990s, ecologists and photogrammetrists may devise novel ways of extracting insights from conventional photographs, especially those that are carefully matched.

Surveys Inexpensive

These surveys of parklands typifying "base conditions" are timely and comparatively inexpensive. They also respond to the Park Service's mission of retaining a sample of pristine natural environments for inspiration, upper-level education, and both park-based and academic research. Some relict sites can become RNAs, but in any case all can be better understood and more knowledgeably managed with the information, data, and photographs the Conservancy and the Park Service have acquired. The site writeups will appear in three volumes (companion to the photo archives) this winter, and both project phases will be described in a forthcoming *Natural Areas Journal* article.

The project originators envisioned a third phase involving northern Arizona parks and monuments, plus Chaco Canyon in northwestern New Mexico. Grand Canyon and Petrified Forest are the most likely to harbor significant relict vegetation occurrences. Still other parks, in the Mojave and Sonoran deserts, could likewise benefit from surveys (augmented with repeatable photography) that are performed before anticipated global-warming effects on drylands begin to register. The relict sites within NPS lands in the southwest could well be crucial in meeting the challenge of understanding and controlling these effects, plus those of steadily increasing visitation.

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Junction Butte, Canyonlands National Park, Utah. A relict area showing differences in plant composition in comparison to the nearby "mainland." Photo by Charles Schelz.