Natural Resource Information Division

NEW HORIZONS

In 1996, the National Park Service developed innovative approaches to preserve the natural resources of the national park system. Driven by the need to progress in light of rising threats and declining expenditures for natural resource management, managers across the country developed new and better ways of protecting natural resources with the staff and funds that they have. Working smarter, this technical yet passionate work force created opportunities where few initially seemed to exist and made some exciting improvements that advanced our efforts to meet mounting challenges.

Innovative staffing

New program prescribed for wildfire management

by Ben Jacobs

Fuel accumulation has reached dangerous levels throughout most western U.S. forests. All one has to do is look at the onslaught of wildland fires that affected national parks in the summer of 1996 to realize that resource managers no longer have the luxury of responding solely in the tradition of full fire suppression. To do so ultimately contributes further to increased fuel loads. The Ackerson Complex in Yosemite, the Chapin Fire in Mesa Verde, and the Dome Fire in Bandelier all bear testimony to nature's furious reply to decades of fire exclusion.

Using a proactive approach to the hazard fuel problem, the National Park Service created the Prescribed Fire Support Module Program in 1995. What started out as a trial experiment evolved into a full-fledged undertaking during the 1996 fire season. The program consists of 28 individuals divided into five modules and distributed between Bandelier National Monument, Whiskeytown National Recreation Area, and Yellowstone and Zion national parks. According to the program operations guide, "the purpose of the modules is to provide the National Park Service with skilled and mobile personnel that are dedicated principally to prescribed fire management." In 1996, this was the only program of its kind in the nation.

The primary mission of the module is to assist with prescribed natural fires in the areas of holding, monitoring, and mapping and predicting fire behavior. Prescribed natural fires are naturally ignited wildland fires that are allowed to burn as long as they are within specific weather and fuel prescriptions; experts are needed on site to monitor their behavior and keep them within designated boundaries. Module members were a key resource on 14 prescribed natural fires in the national park system in 1996. From Sequoia-Kings Canyon to the Everglades, module personnel rotated through prescribed natural fires in six national parks. While some of the fires never grew larger than 1 acre, five of them reached acreages greater than 1,000. Large landscape fires of this size are exactly what many parks need to reduce fuels to manageable levels.

Another tool the modules use to achieve this end is to ignite, hold, monitor, and prepare management-ignited prescribed fires. This is the second priority of the program, and in 1996, modules assisted 16 parks with over 40 of these burns.

Despite these successes, more is needed to restore fire to its proper ecological role in the national park system. During busy times, such as the autumn burning season, demand for the modules far exceeds the supply. By some estimates, six to seven modules are needed year-round to manage just the management-ignited prescribed

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A researcher prepares to look for lofty lichens *at Sequoia National Park.*

fires throughout the park system. Other federal agencies have become increasingly interested in using modules for holding prescribed natural fires and executing management-ignited prescribed fires, or as models for similar programs to reduce their own hazard fuels.

As we head into the 1997 fire season, the Prescribed Fire Support Module Program will possibly expand into the Midwest Region. To mitigate budget constraints, future modules may be partially funded by other federal agencies. Dedicated prescribed fire resources are an important step toward our commitment to reduce fuels in national parks. With the establishment of this program, we continue to be at the forefront of progressive fire management.

Fire Management Program Center

The Prescribed Fire Support Module *monitored, controlled, and mapped several blazes in the national park system in 1996, including the Wildcat prescribed natural fire at Zion National Park, Utah.*

New methods

Katmai takes on a dirty job and does it right

by Mark Ziegenbein

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Park visitors demand smooth roads, well-maintained campgrounds, and safe facilities. Few, however, consider the millions of tons of sand, rock, and gravel needed to build and maintain the conveniences we all take for granted. Fewer, yet, think of the large areas of land that we disturb to get these raw materials. In 1996, the NPS Geologic Resources Division and Denver Service Center developed a blueprint for Katmai National Park and Preserve, Alaska, to achieve its maintenance goals while reducing overall impacts to its natural resources. The *Katmai Sand, Rock, and Gravel Plan* may serve as a template for other parks with similar maintenance concerns.

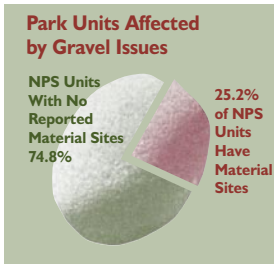
At last count, the National Park Service was responsible for maintaining at least 16,000 buildings, 8,000 miles of roads, 1,450 bridges and tunnels, 400 dams, 5,000 housing units, 1,500 water and sewer systems, 300 fueling facilities, and 2,000 fuel storage tanks. All these require sand, rock, clay, or gravel to build and maintain. Resurfacing a typical two-lane road can take 12,000 cubic yards of aggregate per mile (equivalent to 3.2 Washington Monuments), even when the pavement is recycled. Consider the miles of roads in parks and that

An active gravel source, *this pit at Katmai will be reclaimed as addressed in the recent sand and gravel management plan.*

Geologic Resources Division

each mile will be resurfaced every 15 years and the staggering consumption rate becomes evident. While most parks get gravel outside their boundaries, others may need to extract internally due to material availability, the park's remoteness, or the economic and environmental impacts of gravel importation. Nationwide, over 1,000 extraction sites exist in more than 80 units of the national park system, and parks are currently mining 165 of these sites for maintenance or construction projects.

Katmai has just completed a sand, rock, and gravel plan. This plan serves as an example of how thoughtful planning can reduce costs, restore old extraction areas, and minimize the impact of future mining. The integrated project planning and environmental review process at Katmai involved quantifying current and long-term gravel needs; identifying potential gravel sources within and outside the park; investigating potential resource conflicts with the help of park experts and the public; documenting the dollar and environmental cost of importing material versus in-park extraction; and, once it was clear that in-park extraction was the only reasonable option, designing an extraction and restoration plan that reduced the overall area of disturbance, closed unneeded pits, and concentrated activities in areas that avoided adverse impacts. As demonstrated at Katmai in 1996, with careful design, documentation of environmental effects, and the involvement of resource experts and the public, parks can provide for sand, rock, and gravel needs without excessive impacts.



Number of park units *affected by gravel issues. Figures are derived from a 1992 administrative sand and gravel questionnaire.*

Collaborative decision making in the Pacific Northwest

by Cathy Rhodes

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The Clean Air Act provides a regulatory process called Best Available Retrofit Technology (BART) for protecting visibility in Class I areas, which include many units of the national park system. This process is complex and requires economic analysis and scientific studies to determine if control technology should be applied to a pollution source that is contributing to visibility impairment. In 1996, the potential for diminished views at Mount Rainier National Park, Washington, led to an alternative process for protecting natural resources that resulted in a quicker and better solution.

Located 50 miles south of Mount Rainier, the Centralia Power Plant is coal-fired and does not currently control sulfur dioxide emissions. National Park Service research from 1990 indicates that the plant contributes significantly to visibility impairment at the park, making it a candidate for BART. In 1995, a state permit action that could have precluded future control requirements under BART forced the National Park Service to take action.

To avoid the staff and research-intensive requirements of the BART process, the National Park Service, plant owners, the U.S. Forest Service, and regulatory agencies formed a collaborative decision making group. Intense monthly meetings in 1996 required participants to understand and evaluate complex technical processes and economic information, changing regulations, and each other's concerns. The resulting solution reduces the frequency of the plant's impact on visibility at the nearby Class I areas from 26% of "clear" days to 1% of clear days in eight years. BART could have taken much longer due to "dueling research" and litigation of results.

Also, because of the factors considered, BART would likely have resulted in less emissions reductions than the collaborative solution, which meets the goal of achieving greater benefit for park resources without adversely affecting the economy of the local community.

In 1984, we identified visibility impairment in all of our Class I areas in the lower 48 United States. However, sufficient staff and money are not available to identify and pursue all contributing sources. Likewise, data are lacking to satisfy critics and sustain legal processes. Nevertheless, should the opportunity arise in the future, the collaborative decision making process serves as a model for how we can work with interested parties to resolve our concerns in a more cooperative, expeditious, and certain manner than provided by legal alternatives.

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Future emissions *from the Centralia Power Plant will be reduced according to a solution reached by a collaborative decision-making group, improving visibility at Mount Rainier National Park.*

Resources benefit from new evaluation process

by Abigail Miller

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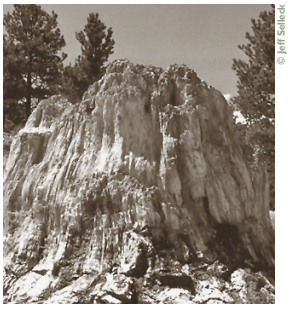
A new look for the National Park Service line-item construction program suggests that resource managers should pay more attention to construction projects as potential natural resource management solutions. This program was reengineered in 1995 and 1996, partly in response to congressional expressions of concern that included cost overruns and a finding that "the priority system [used by the National Park Service] is undecipherable."

In the past, the National Park Service relied on the collective wisdom of its senior managers in an informal process to set construction priorities. In 1996, we adopted a new system that uses a formal process and a project assessment team to rate and rank projects. Called *choosing by advantages*, the decision-making process focuses on the importance of individual contributions, or specific advantages, of each project, rather than the importance of broad, abstract categories.

Last July, the results of reengineering the priority-setting process were implemented for the first time and numerous projects with benefits to natural resources were evaluated. Most of these were projects to reduce or eliminate water pollution, and sewage treatment projects were the most common. Upgrades of such plants at Yellowstone and Glacier Bay national parks that would eliminate discharges to sensitive waters, and had good information about the discharges and the threats they pose, scored relatively high in the "eliminates threats" category. Projects to remove septic systems that were leaking near wetlands or significant water resources at Cape Cod National Seashore and Acadia National Park also scored well. Two high-scoring projects at Mammoth Cave and Wind Cave national parks dealt with preventing polluted waters from entering cave systems. Many additional projects that would benefit natural resource preservation in other ways also scored well.

We learned some lessons here. First, if construction can provide solutions to natural resource problems, resource personnel should work closely with their facility manager as they design projects. Second, the definition of what constitutes a "construction" project is broader than many believe. If a project costs more than $500,000 and less than $20 million, it may be eligible for construction funding and it could be a resource rehabilitation project. Third, projects that have resource benefits of any kind will receive more credit if objective data are included in the package. Fourth, the system is explicitly open to resource protection projects and will give them a fair evaluation. Finally, the new process adds value to parks by favoring those projects that contribute to resource protection, high quality visitor experience, or improved park operations, including operating in a sustainable and environmentally responsible manner.



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Open to the elements *and subject to vandalism, this fossilized sequoia tree stump at Florissant Fossil Beds National Monument, Colorado, will be protected in the future through construction of a shelter structure.*

William Tweed

Cabins at Sequoia National Park *are slated for removal under the new construction project evaluation process. Estimated to cost $100 million, projects of this magnitude will require specific direction from Congress in the future.*

Technical advances

Canada thistle control by insects

by Ross Rice and Dan Roddy

In 1996, biological control of the Canada thistle made the leap from research to applied resource management at Wind Cave National Park, South Dakota. A problem in western U.S. parks for years, Canada thistle is a fast-spreading exotic that overtakes native vegetation, greatly altering the natural landscape. Although herbicides offer a course of control, they have substantial disadvantages associated with them. They are not specific and kill both target and nontarget species. This can create a disturbance zone that is ripe for invasion by aggressive exotics, making restoration of a natural condition nearly impossible. The thistle can also become resistant to some herbicides over time.

© Noah Poritz, Bio-control of Weeds

Canada thistle (*Cirsium arvense*), *a widespread noxious weed in many North American parks.*

Furthermore, some of the herbicides most effective against the thistle are carried in groundwater and runoff, a particular concern for cave resources. We banned the use of herbicides around the cave and forced ourselves to find other alternatives. The answer was biological controls.

The project began in 1991 under the direction of Dr. Deborah M. Kendall, an entomologist from Fort Lewis College, Durango, Colorado. Her work has focused on using three biological control agents: a gall fly *(Urophora cardui)*, a stem mining weevil *(Ceutorhynchus litura)*, and a seed head weevil *(Larinus planus)*. All have been approved by APHIS, the Animal and Plant Health Inspection Service, and others for release in the United States. Researchers and resource managers have monitored study plots annually since the first experimental releases in 1991. Results have varied, but reductions of the thistle by as much as 48% have been recorded in a single year. Biological controls do not eliminate nontarget species, and native grasses and forbs are clearly returning where the thistle has been reduced.

In 1996, the park began harvesting biological control insects from research plots for deployment in new sites throughout the park. Seven-hundred seed head weevils and 30 galls were collected from six sites and released in eight previously untreated sites. Collection is a simple matter of removing insects from established sites and releasing them at new sites. Park staff trained a Student Conservation Association crew in about an hour, and before the day was over the crew completed the entire process of collection, transportation, and release.

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The biological controls *in use at Wind Cave include the release of the gall fly* (Urophora cardui)*.*

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The flowerhead weevil *(Larinus planus) is also a biological weapon against the Canada thistle.*

While collection and release is simple, startup costs for the control agents themselves are high. In comparison with the annual cost of herbicides, however, this program may be more affordable in the long run. Training and certification for the use of herbicides is costly, and the herbicides themselves are expensive. Biocontrol requires little application training, no certification, and no hazardous materials disposal fees. Costs may also drop if the program becomes self-perpetuating and a supply of insects is readily available for collection and release on other park sites.

Like the thistle, the biocontrol program is spreading. In 1996, Badlands National Park started a similar effort in association with Dr. Kendall modeled after the Wind Cave program.

Improving communications

Building public support for natural resource management

by Lissa Fox

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Natural resource preservation and protection is a complicated and complex process. This complexity often breeds public confusion just when the parks need public support. An informed public, one that understands the critical resource issues facing the parks, can and should be our greatest ally for resource protection.

To advance public understanding of natural resource issues, an interdisciplinary group of resource managers and interpreters produced the *Natural Resource Issues Interpretation in the National Park Service: Action Plan* in 1996. Derived from recommendations made in response to *A Strategic Plan for Improving the Natural Resource Program of the National Park Service*, the plan lays out a clear strategy for educating the public on natural resource issues using the established and accomplished interpretive infrastructure of the National Park Service.

Each recommended action has been assigned a time frame and the responsible individuals identified. These individuals range from the NPS director to field resource managers and interpreters. No one individual is responsible for implementation of the plan; in order for it to succeed, everyone in the National Park Service must accept responsibility.

Ranger-guided activities *that incorporate discussions of science and resource management issues are critical to the mission of natural resource preservation in parks.*

Taking advantage of the Information Superhighway

by Jen Coffey and Chuck Rafkind

The National Park Service undertook a major redesign of its World Wide Web site and servers in 1996, affirming its commitment to use of the Information Superhighway as a valuable medium for exchanging information with partners and helping the public understand the need for preserving the resources in the national park system. Although we have made progress toward the goal of connecting all parks to DOI-NET and the Internet, limited funding has hampered this effort leaving about 150 parks still to be connected. Those parks with access to the Web are finding that this technology opens up a new world of cooperation, information resources, and ease of communication.

Through the Internet, we can access a wealth of information applicable to many different areas of responsibility. We can learn of training and conference opportunities and about issues that concern other governmental and nongovernmental organizations and what they are doing about them. This communication tool broadens our base of knowledge, understanding, and support, and is like adding a staff of hundreds of specialists and interested parties. It gives us a broader audience and can increase participation in park programs—expanding a park's network of partners. It also speeds up information transfer and can be a time and money saver. Furthermore, it has become a new forum of public outreach as parks distribute reports and other park literature to interested individuals, and governmental personnel on the local, state, regional, and federal levels quickly.

For example, during 1996, the resource management staff at Colonial National Historical Park in Virginia was able to develop and recruit new researchers for the park natural science program through the Internet. They used this tool to discuss and develop water-quality monitoring protocols for specific projects. Within two weeks, the park shared four drafts among university and NPS scientists and have a final agreed upon protocol and cooperative agreement.

The Park Service is using the Internet as a conduit to furnish information at both the park and national levels. Each park has a web page and the new NPS natural resource website, named NatureNet, was introduced in 1996. NatureNet provides information on the air, biologic, geologic, and water resources in the national park system. It incorporates an electronic publishing program, new in 1996, with electronic copies of more recent natural resource publications now available on the Internet. An e-mail button located on NatureNet allows the public to readily communicate with us instantaneously from anywhere in the world regarding their questions, concerns, and suggestions about the care of the resources in America's national parks. Visitation to NatureNet increased at a rate of roughly 10% each week throughout 1996, with about 22,000 visits per week by the year's end. Indications are that this trend will continue.

Although the National Park Service made strides during 1996 in using the Internet, additional technologies are needed to optimize the use of the Information Superhighway in helping us accomplish our mission. For example, an *intranet* for our internal use is being developed to facilitate the exchange of information between parks and central offices. The conversion of natural resource database application software is being considered so that natural resource information from parks may be easily and securely accessed, updated, and processed through the intranet. Perhaps the most important task ahead is to get all parks connected to the World Wide Web to enable them to partake in the opportunities it provides.

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The Information Superhighway *has the potential to connect parks with science agencies, libraries, museums, and other sources of information.*

Natural Resource Information Division, Philip Thys