20 Years Ago in Park Science

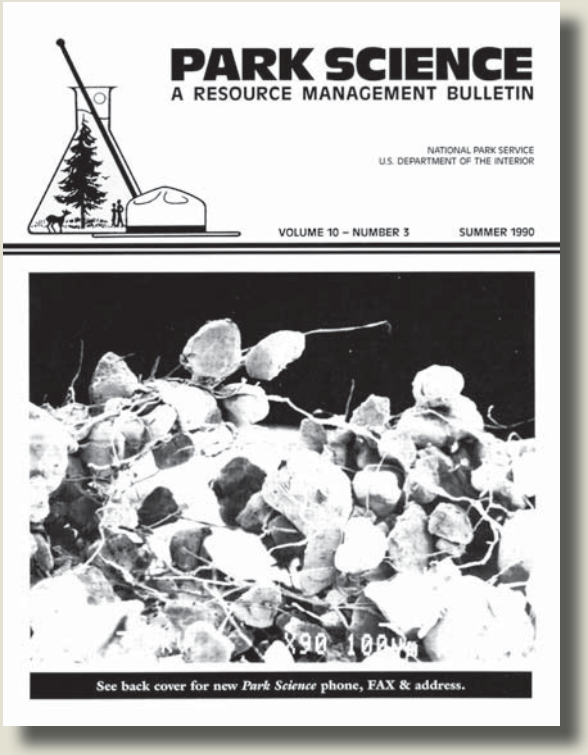
Renewable gravel sources for road maintenance in Denali NP&P

A 90-MILE GRAVEL ROAD FORMS THE MAIN TRANS-portation corridor into Denali National Park and Preserve (DENA). Decisions by previous park managers not to pave this road were based on a desire to maintain a wilderness quality to the road system. Also, it was felt that asphalt pavement might act as a hindrance to migrating wildlife within the park. As such, the gravel roadbed requires long-term material sources for annual maintenance and resurfacing. NPS requirements for in-park material sites impose special constraints upon managers considering source development. Perhaps the most important of these is that the site and method of excavation operations should lend themselves to as close a return to a natural condition as possible. . . .

A research program was initiated in 1988 to provide a detailed and comprehensive analysis of the fluvial processes that occur near and in an alluvial floodplain gravel removal site. The determination of a safe yield for gravel removal and the proper placement of removal sites on the Toklat River floodplain required a two-fold approach.

Computer modeling was employed to note the effect of annual floods on various excavation configurations. . . . The second approach method used in the study was analysis of experimental gravel pits excavated on the Toklat floodplain during the 1988 and 1989 summers. . . .

Based on the study results, it would appear that extraction design based on mimicking natural channels on a braided drainage course will encourage rapid healing and gravel replenishment. It should be noted that terms such as "healing" and even "replenishment" are difficult to quantify, and that estimates of replenished gravel (such as 77%) should be used with caution, and perhaps only in terms of general trends.



Additional hydrologic studies of the Toklat basin are continuing. A complete analysis, based on both empirical observations and mathematical modeling, should allow NPS planners to formulate a practical, yet conservative, gravel extraction management plan to meet park needs while vigorously protecting park resources and promoting rapid site rehabilitation.

Reference

Karle, K. F. 1990. Renewable gravel sources for road maintenance in Denali NP&P. Park Science 10(3):5.