

Soundscape management at Grand Canyon National Park

NPS PHOTO/SARAH PALZARANO



Acoustic Technician Laura Levy samples sounds from Colorado River rapids.

By Jane Rodgers

IN FEBRUARY 1919, THE FIRST AIR TOUR over the Grand Canyon was recorded; that fall the area was officially designated as Grand Canyon National Park. Fifty-six years later, the 1975 Grand Canyon National Park Enlargement Act established that where impacts from aviation occur, natural quiet should be protected as both a resource and a value in the park. Following the National Parks Overflights Act of 1987, the Federal Aviation Administration established a special flight rules area for the park. In an effort to restore natural quiet at Grand Canyon and to improve aviation safety, flights were restricted below 14,500 feet, flight-free zones were established, and special routes for commercial sightseeing tours were created. After another 20 years of interim regula-

tions, congressional interest, departmental reports, negotiations and consultation, and the establishment of a National Park Service-Federal Aviation Administration Grand Canyon Working Group, Grand Canyon National Park is finally on the verge of completing an environmental impact statement to achieve substantial restoration of natural quiet at the park.

So where's the science? In 2003, the park's Science and Resources Management Program recognized the critical need to establish a soundscape program to collect and analyze local acoustic data. The Grand Canyon Soundscape Program has since played an active support role in park planning to better steward park soundscapes. In support of overflights planning,

Grand Canyon staff recorded 12 months of continuous audio data and measured decibel levels under air tour corridors (see photo, opposite, at right). These data allowed park managers to determine natural sound levels for winter and summer seasons in four vegetation zones. Because *NPS Management Policies* states that the natural ambient sound level is the baseline condition or standard for determining impacts to soundscapes, these data provide park managers with essential information needed for soundscape planning in the park. Data were used to compare noise models, assess developed and transitional area soundscapes, and create visual spectrograms for aircraft audibility analysis (see article, page 48). In order to assess impacts to the threatened Mexican spotted

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owl, acoustic data were collected adjacent to breeding sites; data are currently being analyzed using sound analysis software such as Raven (<http://www.birds.cornell.edu/brp/raven/RavenOverview.html>) to look for correlations between aircraft noise and the disturbance of birds.

In addition to overflights monitoring and management, the park has been interested in a variety of other planning and stewardship activities relating to soundscapes. Activities included collection and analysis of acoustic data from river rapids (see photo, opposite), fire-fighting equipment (see photo, below), and popular visitor use areas. Recently, a sound system was deployed at Tusayan Ruins, located near Desert View, to quantify noise from air tours interfering with ranger programs (using the U.S. Environmental Protection Agency criterion for speech interference for interpretive programs). In 2008 and 2009, soundscape staff collaborated with the Grand Canyon Youth program to develop a soundscape-themed science

project for visually impaired teenagers (see article, page 50). Outdoor recreation planning staff also used acoustic data to determine if helicopters exchanging river trip passengers are complying with Colorado River Management Plan guidelines. Finally, in an effort to support our neighboring parks, Grand Canyon National Park staff established 2007 baseline sound levels at Walnut Canyon National Monument prior to runway expansion at Flagstaff's Pulliam Airport.

While the current focus of the park's soundscape work relates to overflights planning, park staff hopes to broaden the program across all cultural and natural soundscape issues. Future efforts will include the development of a parkwide soundscape management plan and implementation of the overflights environmental impact statement.

Further information

For more information and copies of all park reports and publications, please visit our Web site at <http://www.nps.gov/grca/naturescience/soundscape.htm>.

About the author

Jane Rodgers is the Science and Resources Management deputy chief for socio-cultural resources at Grand Canyon National Park and coordinates work on soundscape issues on a part-time basis. (The park plans to hire a full-time acoustic technician to monitor the soundscape following completion of the overflights environmental impact statement.) Rodgers can be reached at 928- 606-5793 and by e-mail at jane_rodgers@nps.gov.

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(Above) Sampling sounds from firefighting equipment. (Right) This acoustic monitoring station records aircraft overflight noise occurring in the special flight rules area of Grand Canyon National Park.



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