

Case Studies

Protecting the acoustic conditions at Great Sand Dunes National Park and Preserve

By Frank Turina

IN A DECISION THAT HIGHLIGHTS THE

importance of scientific data and analyses in the protection of park resources and values, a federal judge in Colorado indefinitely blocked any drilling in a wildlife refuge next to Great Sand Dunes National Park and Preserve. Given the potential consequences of the judge's ruling, the value of accurate and reliable information supporting the decision cannot be overstated.

U.S. District Court Judge Walker Miller granted a preliminary injunction, ruling that local environmental groups presented adequate evidence that oil and gas drilling would cause irreparable injury to Colorado's Baca National Wildlife Refuge. The decision blocks drilling while the lawsuit moves through the courts.

In his ruling, Judge Miller noted that the refuge contains wetlands, habitat for a variety of wildlife and fish, and a "large expanse of undeveloped land with a significant sense of place and quiet." This statement was based in part on data collected by the Natural Sounds Program at Great Sand Dunes National Park in an area near the proposed drilling sites.

At the request of park managers, the Natural Sounds Program deployed an acoustic monitoring system in the park close to the Baca National Wildlife Refuge from 24 September to 10 October 2008 to assess potential effects from proposed oil and gas development on U.S. Fish and Wildlife Service land adjacent to the park (see the

Table 1. Sound pressure levels at Great Sand Dunes National Park

Year	Existing Ambient (L_{50})		Natural Ambient (L_{nat})	
	Day 08:00-19:00	Night 20:00-07:00	Day 08:00-19:00	Night 20:00-07:00
2008 data	20.5	15.0	17.3	14.7
2009 data**	22.3	11.0	17.0*	8.7*

*Levels are estimated using the L_{90} exceedence level.

**Low noise microphone.

site photo on page 34). Equipment was used to characterize the existing ambient sound levels and calculate natural ambient sound levels.

This monitoring led to the discovery that the acoustical environment in Great Sand Dunes National Park and Preserve ranks as one of the quietest ever monitored by the Natural Sounds Program. The levels recorded during 2008 were extremely low and likely represented the technical limits of the data collection systems used, rather than actual sound pressure levels present at the site. In order to more accurately capture actual acoustic conditions in the park, the Natural Sounds Program returned to the park in 2009 to deploy a highly sensitive, low-noise microphone as sensitive as the human ear at a location known as Alpine Camp. The table shares the existing and natural ambient sound levels at the park from the 2008 and 2009 data.

Preliminary analyses of the low-noise microphone data indicate a nighttime existing ambient sound level of 11 dB(A) and an estimated nighttime natural ambient level of 8.7 dB(A). To put these levels

into perspective, consider that the sound of human breathing at a distance of 3 meters (9.8 ft) is approximately 10 dB(A). Previously, the lowest sound level in a national park (10 dB(A)) was recorded in the volcanic crater at Haleakala National Park, Hawaii.

This monitoring effort was instrumental in describing the acoustic environment of the area and will provide valuable information that can be used to help mitigate potential adverse effects from the proposed energy development. The Natural Sounds Program looks forward to continuing to provide important scientific data and support to help parks characterize and mitigate potential acoustic impacts to park resources from energy development and other activities throughout the National Park System.

About the author

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