

Acoustic Environment and Soundscape Resource Summary Dry Tortugas National Park

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Natural Sounds & Night Skies Division



The acoustic environment is a resource with intrinsic value. It is important as a natural resource, a cultural resource, or both. It is a critical component of wilderness character and plays an important role in wildlife communication, behavior, and other ecological processes. Results from multiple surveys of the American public indicate that hearing the sounds of nature is an important reason for visiting national parks. Therefore, the value of acoustic environments and soundscapes is related to an array of park resources and has broad implications for park management. The quality of the acoustic environment is relevant in nearly every unit in the NPS System. When developing the foundation document, park staff should consider the acoustic environment as a resource with inherent value. The topics in Attachment 1 discuss the importance of the soundscape and the acoustic environment in relation to park resources and values.



At **Dry Tortugas Park Name**, acoustic resources protection and noise reduction are related to the following park priorities:

- enhancing visitor experience
- conducting interpretive programs
- historic and coastal settings throughout the park
- birding and other wildlife viewing
- preserving quality wildlife habitat
- camping opportunities

Potential Threats

- Noise from park facilities and operations, HVAC systems
- Noise from nearby development, transportation, watercraft and aircraft
- Noise from visitors such as visitor vehicles, music, shouting, electronics

Potential Opportunities

- Reduce noise from park operations (time activities to preserve quiet times, purchase quieter equipment)
- Outreach to visitors about reducing noise
- Communicate with public about benefits of noise reduction to park experience and wildlife health

Existing data/planning:

- Baseline acoustic conditions from sampling in 2008, 2009
- Predicted acoustic conditions based on continental acoustic model

Future data/planning:

- Re-measure acoustic conditions to describe trend or address a specific noise issue
- Develop acoustic goals, indicators and standards in an acoustic resources plan or related park plans or strategies

Quality of the Resource at Dry Tortugas NP

NSNSD examines whether existing sound levels exceed certain decibel (dBA) values that relate to human health and speech. At 35 dBA, human and wildlife sleep can be interrupted (Haralabidis, et. al., 2008). The World Health Organization's recommends that noise levels inside bedrooms remain below 45 dBA (Berglund, et. al., 1999). At 52 dBA, a listener wouldn't clearly hear another person speaking in a raised voice at 10 meters (Environmental Protection Agency, 1974). At 60 dBA, normal voice communications can be interrupted at 1 meter. Visitors in the park would likely be conducting such conversations.

A baseline acoustic inventory was conducted for Dry Tortugas NP in 2008 and 2009. This research provides a comprehensive description of the acoustic environment by characterizing existing sound levels, estimating natural

ambient sound levels, and identifying audible sound sources. The methods, data and results of this monitoring effort are provided in an Acoustic Snapshot Report, an Acoustic Monitoring Report, included as attachments. The sound levels at Dry Tortugas NP are displayed in Table 1. At these levels, campers would begin to be interrupted during sleep but personal and interpretive speech likely could be heard by a listener but since sound fluctuates there may be periods when noise exceeds the listening thresholds described above.

Table 1. Summary of measured ambient sound level data for both summer and winter seasons.

Acoustic Zone	Site Name	Site ID	Total # Days	Existing Ambient						Existing Ambient Without Air Tours		Existing Ambient Without All Aircraft		Natural Ambient	
				Daytime Data (7 am to 7 pm)			Nighttime Data (7 pm to 7 am)			Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
				L _{Aeq} (dBA)	L ₅₀ (dBA)	L ₉₀ (dBA)	L _{Aeq} (dBA)	L ₅₀ (dBA)	L ₉₀ (dBA)	L ₅₀ (dBA)	L ₅₀ (dBA)	L ₅₀ (dBA)	L ₅₀ (dBA)	L ₅₀ (dBA)	L ₅₀ (dBA)
Summer Season															
Developed	DRT0001	Fort Jefferson	4	47.9	45.3	36.3	47.7	46.3	40.6	45.3	46.3	44.7	46.3	37.8	46.2
Winter Season															
Developed	DRT0001	Fort Jefferson	49	50.5	46.0	42.1	45.9	43.5	40.1	46.0	43.5	45.8	43.5	42.1	40.1