



Aircraft Overflights Quarterly Focus - December 2005

Last quarter's Focus article was on "natural ambient" and how it is determined and used in soundscape characterization at GCNP. The "natural ambient" was defined in last quarter's article as "The natural sound conditions found in a given area, including all sounds of nature." The natural ambient sound level of a park is comprised of the natural sound conditions in an area of the park, also called an acoustic zone, which exists in the absence of mechanical/electrical human-produced noise.

This Focus article is on the two-zoned system used at Grand Canyon National Park to model aircraft noise within the park. The following information was recently provided to the National Parks Overflight Advisory Group (NPOAG) to present the reasons and purpose for establishing a two-zoned acoustic baseline at Grand Canyon National Park (GCNP) to assess noise impacts from aircraft overflying GCNP. To aid in understanding this concept, a map is included that illustrates the modeling zones.

In the 1994 Report to Congress, the NPS had divided the park into three ambient zones, based on vegetation classes (Pinyon-Juniper Woodland, Desert Scrub, and Sparse Coniferous Forest). The natural ambient sound used for these three categories were based upon the recommendations of NPS contractor BBN Systems and Technologies. Later, Harris Miller Miller and Hanson, Inc. (HMMH) conducted acoustic measurements in these classes, and increased the accuracy of river corridor by establishing a Colorado River Rapids category.

In December, 1998 HMMH was tasked by the NPS to review acoustic data for GCNP to determine the appropriate ambient sound levels for use in the on-going Federal Aviation Administration's (FAA) rulemaking. The NPS was interested in pursuing the Model Validation Study to further explore these and other questions that arose from the work, with the goal of improving the accuracy of the modeling of aircraft noise in the park environment.

On Wednesday July 14, 1999 the NPS released the Federal Register Notice (Vol. 64, No.134) to clarify its reasons for and expected effects of the proposed refinement in the methodology used to assess aircraft noise impacts. In this notice several reasons are given for the changes:

- NPS policy has been consistent that "audibility" is the basis for assessing progress towards P.L. 100-91 for "substantially achieving restoration of natural quiet to GCNP, for a 12-hour day);"
- The NPS recognized that aircraft noise management in park environment's was an evolving science, and therefore relied on contracted professional consultants in the acoustic field, like BBN Systems, to generate audibility-based sound metrics. BBN Systems designed the NPS noise model "National Park Service Overflights Decision Support System" (NODSS);
- Another NPS concern at this time was the reliability of information about the numbers of air tour operations over the park. Given the limitations of the available data (this predated the requirement for operators to report to FAA on number of operations), the NPS opted to model aircraft noise impacts using the more conservative standard, "noticeability," as the threshold of impact. The results of this modeling were interpreted with full knowledge that the definition of substantial restoration was based on audibility.
- Even when NPS used the least stringent standard of noticeability, the NPS determined in it's 1995 Report that natural quiet had not been substantially restored to GCNP;
- Finally, since the start of the 1996 rulemaking, FAA and NPS agreed that continuing to gather additional sound information and research was necessary to improve their knowledge and accuracy of the modeling effort.

This 1999 Federal Register went on to clarify the NPS two zoned system and changed the threshold for measuring the onset of aircraft noise impacts for certain areas of the park for noise modeling purposes only.

Zone one, which would encompass about one-third of the park area, has a "noticeability" threshold, and includes developed areas of the park, recreational use, and limited accessible locations. Public health and safety, and the pollution of water resources are also of concern.

Zone Two, which would encompass about two-thirds of the park's area, has an "audibility" threshold, and includes proposed wilderness and backcountry hiking areas, a large portion of the river corridor, resource characteristics, and many scenic view points and visitor gathering locations.

NPS believed, in 1999, that the thresholds for both Zones One and Two are affected by use of the "averaged" natural ambient sound levels in the respective zones, and this was a way to address those concerns.



Dual Noise Standard Zones

as set forth in a 1999 Federal Register Notice 64FR3969 and defended in 64FR38006

Noise Standard

- Noticeability, 34%
- Detectability, 66%

Tuweep and Phantom Ranch are included in the detectability standard because they are managed to more primitive standards than the other developed areas. The North Rim paved roads are included in the detectability standard because they are narrow and surrounded by proposed wilderness.

