National Park Service
U.S. Department of the Interior

Social Science Division

Expedited Approval for NPS-Sponsored Public Surveys

1. **Project Title | Submission Date:**

Understanding Visitors' Reactions to Soundscapes in Sequoia and Kings Canyon National Parks	November 9, 2010

2. **Abstract:**

The purpose of this project is to conduct onsite surveys of visitors to the Giant Forest area of Sequoia and Kings Canyon National Parks in order to collect information regarding visitor experiences, perceptions, and attitudes towards sounds in the park. Results will be used to inform park planning and management, including developing indicators and standards for visitor experiences of soundscapes. Of particular interest is whether visitors' knowledge of the sources and purposes of human-caused sounds affects their evaluations of soundscapes.

(not to exceed 150 words)

3. **Principal Investigator Contact Information**

First Name: Peter **Last Name:** Newman

Title: Associate Professor

Affiliation: Colorado State University

Street Address: 232 Forestry Building

City: Fort Collins **State:** CO **Zip code:** 80523

Phone: (970) 491-2839 **Fax:** (970) 491-2255

Email: Peter.Newman@colostate.edu

4. **Park or Program Liaison Contact Information**

First Name: Annie **Last Name:** Esperanza

Title: Air Resource Specialist

Park: Sequoia and Kings Canyon National Parks

Park Office/Division: Division of Resources Management and Science

Street Address: 47050 Generals Highway

City: Three Rivers **State:** CA **Zip code:** 93271

Phone: (559) 565-3777 **Fax:** (559) 565-4253

Email: annie_esperanza@nps.gov

Project Information

5. **Park(s) For Which Research is to be Conducted:** Sequoia and Kings Canyon National Parks (SEKI)

6. **Survey Dates:** 07/01/2011 (mm/dd/yyyy) to 08/30/2011 (mm/dd/yyyy)

7. **Type of Information Collection Instrument (Check ALL that Apply)**

Mail-Back Questionnaire X On-Site Questionnaire Face-to-Face Interview Telephone Survey Focus Groups

❑ **Other (explain)**

8. **Survey Justification: (Use as much space as needed; if necessary include additional explanation on a separate page.)**

Social science research in support of park planning and management is mandated in the *NPS Management Policies 2006* (Section 8.11.1, "Social Science Studies"). The NPS pursues a policy that facilitates social science studies in support of the NPS mission to protect resources and enhance the enjoyment of present and future generations (National Park Service Act of 1916, 38 Stat 535, 16 USC 1, et seq.). NPS policy mandates that social science research will be used to provide an understanding of park visitors, the non-visiting public, gateway communities and regions, and human interactions with park resources. Such studies are needed to provide a scientific basis for park planning, development, operations, management, education, and interpretive activities.

Protecting natural sounds is an important goal set by the National Park Service in management policy 4.9:

> Park natural soundscape resources encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the interrelationships among park natural sounds of different frequencies and volumes. Natural sounds occur within and beyond the range of sounds that humans can perceive, and they can be transmitted through air, water, or solid materials. The National Park Service will preserve, to the greatest extent possible, the natural soundscapes of parks. The Service will restore to the natural condition wherever possible those park soundscapes that have become degraded by unnatural sounds (noise), and will protect natural soundscapes from any unacceptable impacts (National Park Service Management Policies, 2006).

Literature Review. Although the NPS has been measuring natural ambient and human-caused sound levels in parks for over 20 years (Ambrose and Burson, 2004), fewer studies have examined visitors' responses to these sounds (Krog & Engdahl, 2005). Yet there are several reasons why the NPS considers visitors' reactions to sounds in parks to be important inputs into planning and management. Research shows that park visitors often seek out natural soundscapes as part of their experience (Newman, Pilcher, and Stack, 2006a, 2006b). Gramann (1999) concluded that, for some visitors, noise (defined as unwanted sound) can interfere with many benefits that they seek from nature, including temporary escape from psychological and physical stressors. In contrast, anecdotal evidence suggests that other visitors accustomed to urban acoustical environments are sometimes uncomfortable in the absence of familiar human-caused sounds. However people may react, Anderson et al. (1983) showed that visitors' perceptions of sound in outdoor settings influences their evaluations of those environments, And the impact of noise can be more than a nuisance. In some cases, it endangers people's health by producing elevated levels of both physical and psychological stress (Ouis, 2001). For all of these reasons, the soundscape that visitors experience in a park can have an important impact on their enjoyment. Consequently, research on how visitors perceive natural and unnatural sounds in parks--and on the variables that condition these responses—is important to the National Park Service. Of particular interest in this study is whether visitors' knowledge of sources and purposes of human-caused sounds affects their evaluations of these sounds as positive and negative. If it does, then one conceivable approach to managing how people experience park soundscapes (when the sound source

itself cannot be changed) is to educate visitors about the sources and purposes of the sounds. In addition, information from this research can contribute to soundscape management by informing the identification of potential indicators and standards for soundscape conditions in parks.

9. **Survey Methodology: (Use as much space as needed; if necessary include additional explanation on a separate page.)**

(a) Respondent universe:

The respondent universe for the visitor survey will be all recreational visitors (18 years of age and older) to the Giant Forest area of Sequoia and Kings Canyon national parks from July 11, 2011 to August 30, 2011.

(b) Sampling plan/procedures:

Note: There are 4 versions of the onsite questionnaire. Two of these function as treatments and two as controls.

Instrument 1(Helicopter Treatment). This instrument focuses on sounds generated from helicopter overflights. This questionnaire informs respondents that helicopters are a function of search and rescue operations, wildfire management, and support for research and resource management. After receiving this information, respondents listen to recordings made in the park of helicopter overflights and evaluate their acceptability. The percentage of time that helicopters are audible will be manipulated in the recordings while holding all other acoustical variables constant (e.g., decibel).

Instrument 2(Helicopter Control). This instrument is a control for Instrument 1. It also focuses on sounds generated from helicopter overflights, but no information is given regarding the purpose of the flights. Respondents will listen to the same recordings as in Instrument 1.

Instrument 3 (Military Treatment). This instrument focuses on sounds generated from military overflights. The questionnaire informs respondents that military aircraft are allowed to conduct flights over the park, and that consequently visitors occasionally hear aircraft flying overhead. After receiving this information, respondents listen to recordings made in the park of military overflights and evaluate their acceptability. The percentage of time that military overflights are audible will be manipulated in the recordings while holding all other acoustical variables constant (e.g., decibel).

Instrument 4 (Military Control). This instrument is a control for Instrument 3. It focuses on military overflights, but no information will be given regarding to the purpose of the flights. Respondents will listen to the same recordings as Instrument 3.

Instrument 5 (Visitor Log). The visitor log sheet will be used by the surveyor to record non-intrusive information about the visitor based on observation. The surveyor will also note any language barrier that may cause the visitor to refuse to take the on-site survey. The surveyor will ask one question to inquire about previous visits to the park. The information from the visitor logs will be used to when reporting the non-respondent bias.

A total of 6 days will be sampled for each version of the questionnaire (24 days total) and sampling days will be stratified by weekend vs. midweek periods. Furthermore, assignment of questionnaire versions to sampling days within these stratums will be random. Questionnaires will be administered at 1 site in Sequoia and Kings Canyon national parks. This site represents a frontcountry site (Giant Forest). Only one version of the questionnaire will be administered on any given day. Questionnaires will be administered to visitors exiting this area at the formal entry/exit point. On each sampling day a trained surveyor will be stationed at the entry/exit point to Giant Forest from 8:00 a.m. to 5:00 p.m. When the sampling period begins, the surveyor will ask the first visitor to pass if they have previously completed the onsite questionnaire. If the visitor did not previously complete the onsite questionnaire, the surveyor will ask if they would be willing to participate in the survey. Visitors who agree to participate will be administered one version

of the onsite questionnaire. Visitor groups who are unwilling or unable to participate in the survey will be thanked for their consideration. When the surveyor has completed the visitor contact, he/she will contact the next exiting visitor group. This process will continue throughout the sampling period. A series of short breaks for the surveyor will be designed into the sampling schedule.

(c) Instrument administration:

Visitors selected for the study will be read the following script:

"Hello, my name is _____. I am conducting a survey for the National Park Service to better understand your attitudes toward sounds at Sequoia and Kings Canyon National Parks. Participation is voluntary and all the responses are anonymous. Would you be willing to spend a few minutes to answer some important questions regarding your visit here?"

If "NO" then, "Thank you, I hope you enjoy your visit."

If "YES" then, "Thank you, has any member of your group participated in this survey before?"

If "YES" then, "Thank you for participating in this study but you have already provided us with the information we need. Have a great day."

If "NO" then, "Thank you for agreeing to participate in this study. The results from this survey will help the National Park Service better understand visitor experiences, perceptions, and attitudes towards sounds in Sequoia and Kings Canyon National Parks. This survey will take about 15 minutes to complete."

Study participants will be instructed to complete the questionnaire onsite and address any questions to the surveyor.

(d) Expected response rate/confidence levels:

A total of about 856 (214 for each version at each trailhead) visitors will be contacted during the sampling period. Out of an estimated 856 initial contacts with visitors, it is expected that at least 600 (70%, or 150 of each version at each trailhead) will agree to participate in the survey. The day use response rates are based on previous studies conducted at Yosemite National Park (White, 2006). The number of refusals will be recorded and reported (see Attachment 5 – "Sequoia and Kings Canyon National Parks Visitor Survey Log"). When conducting a two-independent sample *t*-test to look for differences between control and treatment groups (one test for the effect of messaging on acceptability of helicopter sounds and one for the effect of messaging on military aircraft sounds), the given sample sizes (150 for each group) would be able to detect a 0.49 true difference in means 99% of the time.

(e) Strategies for dealing with potential non-response bias:

The number of refusals will be recorded, reported, and screened for non-response bias (see Attachment 5 – "Sequoia and Kings Canyon National Parks Visitor Survey Log"). The data from this day use survey will be analyzed for non-response bias by comparing participating groups' characteristics (group size and activity type – i.e., day hiking, backpacking, etc.) to non-participating groups' characteristics gathered on the corresponding survey refusal log sheets. Results of the non-response analyses will be reported.

(f) Description of any pre-testing and peer review of the methods and/or instrument (recommended):

The questions included in this survey were initially designed and reviewed by the principal investigator, research staff and graduate students, scientists from other universities with expertise in survey research methods, and NPS staff. The techniques used for this visitor survey are based on results from a survey that was conducted in Muir Woods National Monument in 2005, 2006, and 2007. Similar questions pertaining to soundscapes were peer reviewed by participants of the 2006 Soundscape Workshop. This workshop was hosted by the National Park Service Natural Sounds Program and Colorado State University

10. **Total Number of Initial Contacts | Expected Respondents:**

1: 214	1: 150
2: 214	2: 150
3: 214	3: 150
4: 214	4: 150
Total: 856	**Total: 600**

11. **Estimated Time to Complete Initial Contact | Instrument (mins.):**

1	15

12. **Total Burden Hours:**

1: 37.5
2: 37.5
3: 37.5
4: 37.5
Total: 150

13. **Reporting Plan:**

A technical study report will summarize results and management recommendations. Journal manuscripts and academic papers will also be prepared. Data will be analyzed using Statistical Package for Social Sciences (SPSS) version 17.0 to compare and quantify acceptability of sounds heard in the audio recordings. These results will also be compared using treatment variables (e.g., messaging and no messaging) to look for statistical differences between groups. Journal manuscripts and academic papers will also be prepared. Copies of all reports and papers will be archived with the National Park Service Social Science Program for inclusion in the Social Science Studies Collection. All surveys will be included in one final report to the NPS.

References

Ambrose, S., & Burson, S. (2004). Soundscape studies in National Parks. *The George Wright Forum, 21*(1), 29-38.

Anderson, T.W., Mulligan, B.E., Goodman, L.S., & Regan, H. Z. (1983). Effects of sound preference for outdoor settings. *Environment and Behavior, 15*(5), 539-565.

Gramann, J. (1999). *The Effect of Mechanical Noise and Natural Sound on Visitor Experiences in Units of the National Park System.* National Park Service *Social Science Research Review* 1(1), 16p.

Krog, N. H., & Engdahl, B. (2005). Annoyance with aircraft noise in local recreational areas and the recreationists' noise situation at home. *Journal of the Acoustical Society of America, 117*(1), 221-231.

Newman P., Pilcher, E., & Stack, D. (2006a). *Yosemite National Park acoustic study: Development of indicators of quality related to soundscapes.* Final study report. Colorado State University.

Newman P., Pilcher, E., & Stack, D. (2006b). *Grand Teton National Park acoustic study: Development of indicators of quality related to soundscapes*. Final study report. Colorado State University.

NPS (2006) Management Policies 2006.

Ouis, D. (2001). Annoyance from road traffic noise: A review. *Journal of Environmental Psychology, 21*(1), 101-120.

White, D.D. (2006). Visitor experiences and transportation systems I Yosemite National Park. National Park Service Technical Report, Yosemite National Park.