



National Park Service
U.S. Department of the Interior

Social Science Program

OMB Control Number 1024-0224
Current Expiration Date:8-31-2014

Programmatic Approval for NPS-Sponsored Public Surveys

Submission Date :8/5/2014

1. **Project Title:** Analyzing the Importance of Night Sky Quality at Bryce Canyon National Park

2. **Abstract:** *Concern for the preservation of dark skies and the problem of light pollution is rising in public consciousness. This shifting attitude is evidenced in national parks by increasing attendance at stargazing programs. However, it is important to establish indicators and standards for high quality nighttime experiences in parks. To address this concern, a survey will be conducted to assess the importance of night skies and related resources to visitors and support the establishment of visitor-based indicators and standards of quality for night sky viewing experiences.*

(not to exceed 150 words)

3. **Principal Investigator Contact Information**

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

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Project Information

5. **Park(s) For Which Research is to be Conducted:** Bryce Canyon National Park (BRCA)

6. **Survey Dates:** 9/1/13 TO 10/31/13

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

Mail-Back
Questionnaire

On-Site
Questionnaire

Face-to-Face
Interview

Telephone
Survey

Focus Groups

Other (explain)

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

Since 2001 the National Park Service (NPS) has systematically inventoried night sky quality in approximately 100 parks. The data show that nearly every park measured exhibited some degree of light pollution. There is very little research available that points to the impact that light pollution has on human expectations and attitudes related to night skies. Combined with growing night sky data, social science research will help the NPS to manage this resource for the benefit of parks and the people who visit them.

The NPS Dark Skies Program has commissioned the Park Studies Laboratory at the University of Vermont (UVM) to conduct a survey that will address questions of visitor attitudes, expectations and acceptable thresholds -of what they consider natural, beautiful, and inspirational - using normative theory and related empirical methods. The purpose is to investigate the meanings of, preferences for, and attitudes about night sky experiences expressed by a sample of park visitors at Bryce Canyon National Park. The overall goal is to help the Night Skies Division understand the qualities that make personal experiences of night skies at park settings rewarding in the context of other activities undertaken during a national park visit.

The interest in night skies extends well beyond the NPS. This research will also be helpful to multiple state, federal, and private business that report well-attended stargazing programs and private tours. Public interest in connecting with night skies has resulted in the appearance of the term *Astro-Tourism* that focuses tourism and the night skies, which is a quickly becoming a significant economic force in regions still retaining relatively dark night skies. This collection will provide the information that is at the heart of various campaigns to develop and dedicate 'dark sky' parks and reserves where the night sky is

preserved for future generations from light pollution.

A previously OMB approved survey (OMB Control Number: 1024-0224) administered at Acadia National Park in the fall of 2013 will be modified and will be used to survey visitors at Bryce Canyon National Park. Comparisons between the data collected at the two parks will be used to understand visitor norms and attitudes about night skies at the two different parks.

This research will help enhance the mission of the Night Skies Program by:

- 1) providing an understanding of the importance of night skies to the general public
- 2) allowing the NPS to set management targets related to visitor use for night sky quality conditions
- 3) adding to the general understanding of the value of conservation of natural places
- 4) adding to the knowledge base of the ecosystem services valued by modern society.

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

(a) Respondent Universe:

The respondent universe for the on-site questionnaire will be all visitors (age 18 and over) to trailhead, and viewpoint sampling sites at Bryce Canyon National Park, between September 1 and October 31, 2014.

(b) Sampling Plan/Procedures:

The sampling period will include the park's peak use periods, during the summer and during the time of day when the majority of visitation occurs day (between 8 a.m. and 5 p.m.). Sampling will be evenly divided between the trailhead, and viewpoint locations. Sampling will occur for seven days at each trailhead and viewpoint location, with weekday and weekend periods representing proportional use. This will ensure that a sufficient number of questionnaires will be completed to make inferences to the visitor populations at these locations with an acceptable degree of precision.

During each sampling period, a trained surveyor will approach groups a selected location in the park (trailheads exits or viewpoints) and ask them to participate in the survey. If members of the visitor groups agree to participate, the person in the group whose birthday is closest to the sampling day will be asked to complete the questionnaire. The completed questionnaire will be returned to the survey attendant. When the surveyor has completed contact with the group, the surveyor will ask the next available group exiting the trailhead (or viewpoint) to participate in the survey. This process will continue throughout the sampling period. Visitors will be asked to complete the questionnaire in the presence of the survey attendant, who will be available to answer any questions and collect the completed questionnaires. A screening question will be used to assure that participants will not be surveyed more than once.

(c) Instrument Administration:

Visitors at the study sites in the parks will be read the following script:

"Excuse me, sir/ma'am. We're conducting a study for the National Park Service to better understand visitor experiences concerning night sky viewing. Your participation is voluntary and all responses are anonymous. Would you be willing to take 15 minutes to help?"

→ If **YES**: *"Thank you. Who in your personal group (who is at least 18 years of age) has the next birthday? Would you be willing to complete this questionnaire? Have you completed a questionnaire about night skies at a different location in the park?"*

→ If **YES**: *"Thank you, but we can only accept one response per personal group. Thank you for your time."*

→ If **NO**: *"Would you complete a survey now?"*

→ If **YES**: The eligible visitors will be given a paper questionnaire and instruction necessary to complete the survey. Question 4 (a-h) will require that the respondent view and respond to a series of questions related to eight night sky simulation images mounted side-by-side on a poster. The survey attendant will assist respondents as they answer this portion of the questionnaire. After completing this portion of the questionnaire, respondents will continue to answer the remaining questions.

→ If **NO to participating in the survey**: *"I understand. I hope you enjoy your visit."*

(d) Expected Response Rate/Confidence Levels:

The overall survey sample size is expected to be approximately 285 visitors. Based on previous experience in conducting similar surveys, it is expected that about 70% of visitors (about 200 individuals) will be willing to participate. In a similar night skies study in Acadia National Park in 2013 that used similar sampling methods, a response rate of 70% was attained. Another night skies study at Acadia, Grand Canyon, and Yosemite National Parks, and Golden Gate National Recreation Area attained a similar 70% response rate. Study findings are estimated to be accurate within 7 percentage points, based on a sample size of approximately 200 from each park using a 95% confidence level. This will be sufficient for NPS planning purposes. The number of people in each visitor party and date and time of refusals will be recorded and reported on a refusal log.

Number of Initial Contacts	Expected Response Rate	Expected Number of Responses	Margin of Error +/- %
285	70%	200	7%

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

Non-response bias will be examined by comparing selected characteristics of the sample population with characteristics observed and recorded in every

group contacted (e.g., group size, gender and group type). Additionally, all visitors approached will be asked to answer three key questions from the survey:

1. *Is viewing the night sky (or “stargazing”) important to you?*
2. *Have you stargazed or observed the night sky in this park (including ranger-led programs) before this visit?*
3. *What is your home zip code or country of residence?*

The responses and observational data will be recorded. The results will be compared to results from the respondents completing the questionnaire to see if non-response bias is present. The results of the check for non-response bias will be reported and any implications for data interpretation will be discussed in any reports prepared for the NPS managers.

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

The questions included in these surveys have been designed and reviewed by the PI, research staff and graduate students at the University of Vermont, and NPS park and regional staff. The questions are nearly identical to those receiving OMB approval and used at Acadia National Park in 2013.

10 Burden Estimates We plan to approach at least 285 individuals during the sampling period. With an anticipated response rate of 70%, we expect to receive 200 total responses for this collection.

We expect that the initial contact time will be one minute per person (285 x 1 minute = 5 hours). We expect that a total of 85 (30%) visitors contacted will refuse to participate in the study, for those individuals we will record their reason for refusal and ask them to answer the three questions that will be used for the non-response check. This is estimated to take no more than 2 minutes (85 x 2 minutes = 3 hours) to complete each session.

We expect that a total of 200 visitors will agree to participate and return a completed survey. With that, an additional 15 minutes will be required for the follow through (200 response x 15 minutes = 50 hours). The total burden for this collection is estimated to be 58 hours.

Estimated Number of Contacts	
Initial Contacts	285

Estimation of Time (minutes)	
Initial Contacts	1

Estimation Burden (hours)	
Initial Contacts	5

Refusal/ nonresponse	85
Total Number of Responses	200

Refusal/ nonresponse	2
Total time to complete and return surveys	15

Refusal/ nonresponse	3
Estimated Burden Hours	50

Total Burden 58

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11. **Reporting Plan:** The results of this information collection activity will be presented in an internal agency report made available to the Night Skies division, shared with participating community leaders, and will also be available upon request.. A copy of the technical study report will be archived with the Social Science Division of the National Park Service for inclusion in the Social Science Studies Collection as required by the Programmatic Approval Process. The key estimates that will be derived from the data collected will be descriptive in nature, primarily measures of central tendency (mean and median), dispersion (standard deviation), and frequency distributions. Some tests for differences in means and proportions may be done. The project results will also be published in a peer-reviewed scientific publication discussing the methods, results, and conclusions.
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