



National Park Service
U.S. Department of the Interior
Social Science Program

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Programmatic Approval for NPS-Sponsored Public Surveys

Submission Date 02-22-2015

1. **Project Title:** A Survey of Rim-to-Rim Hikers at Grand Canyon National Park (GRCA)

2. **Abstract:** Grand Canyon National Park (GRCA) would like to understand the common hydration and nutritional behaviors of Rim-to-Rim (R2R) hikers. The Preventive Search and Rescue Team (PSAR) is responsible for promoting a strong hiker education program through GRCA's *Hike Smart Campaign*. The *Hike Smart Campaign* emphasizes adequate preparation for hiking in the Grand Canyon. In order to improve upon this campaign, this study seeks to understand the relationships between R2R hikers' preparation, hydration patterns, nutritional intake, and environmental factors in a backcountry recreation experience.

(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:** Grand Canyon National Park

6. **Survey Dates:** SPRING 05/2015 TO 06/2015
 FALL 08/2015 TO 10/2015

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

Mail-Back Questionnaire Other (explain)
 On-Site Questionnaire
 Face-to-Face Interview
 Telephone Survey
 Focus Groups

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.*

Rangers and rescue personnel at Grand Canyon Natation Park have requested a survey of visitors to better understand methods of hydration, quality of nutrition, and physiologic responses to environmental factors of hikers in the park. Park rangers need this information to develop meaningful safety and educational messages concerning hiking practices that will avoid costly and dangerous Search and Rescue (SAR) missions.

The goal of this proposed survey is to have information that will be used to update and improve current preventive management strategies as well as the *Hike Smart Campaign* at GRCA. The most recent strategies include recommendations for how much water and food is needed by Rim to Rim (R2R) hikers and how much time is needed to complete a R2R hike. We would like to add statistically valid information about preparedness and awareness of our visitors to the strategic plans and any educational materials aimed towards hikers. Finally the information will be shared to improve general knowledge about visitor experiences and understanding of safe hiking practices that can be used throughout the Southwest, other National Parks and public lands.

9.

Survey (a) Respondent Universe:

Methodology: The respondent universe for this study will include adult visitors (aged 18 and older) who plan to hike Rim-to-Rim in a single day in the GRCA backcountry in the Spring and Fall of 2015.
(Use as much space as needed; if necessary include additional explanation on a separate page.) Visitors will be contacted at the trailhead, asked if they plan to complete a R2R hike in a single day, and if yes, they will be asked to participate in the voluntary survey. All participants will be identified throughout the day by wearing a wristband with a study ID that will be used at each survey station.

A total of 1,071 R2R hikers will be approached and asked to participate in study.

(b) Sampling Plan/Procedures:

1. At the trailhead (Bright Angel, South Kaibab and North Kaibab) and hiking season (Spring or Fall), all hikers will be asked if they are planning to do a R2R hike in a single day. If yes, they will be asked to participate in the voluntary survey.
2. If they are willing, they will be given wristband with a study ID for tracking purposes. The first segment of the survey will be administered at this point as a face-to-face interview.
3. Once the first survey at the trailhead is completed, the hiker will continue with their hike and the administrator will resume recruitment.

(c) Instrument Administration:

This collection will be administered as a face to face interview by Preventive Search and Rescue (PSAR) rangers and volunteers.

The collection will be administered over the course of three stations:

- Station 1: Bright Angel, South Kaibab, or North Kaibab Trailhead
- Station 2: Phantom Ranch Ranger Station
- Station 3: Bright Angel, South Kaibab, or North Kaibab Trailhead

Eight to 12 surveyors will staff the trailheads from 02:00am to 10:00pm on rotating shifts. Because of the limited number of questions at the midpoint there will only be four surveyors at the Phantom Ranch Ranger Station. The presence of multiple surveyors allows the surveyors to quickly select and process participants during the sampling period. At each station, the date, time, location, and the participants study ID will be recorded on the instrument at the beginning of the interview.

The following will be used as the invitation to participate in the study.

“Excuse me, sir/ma’am. We’re conducting a study to understand the hydration and nutritional strategies of Rim-to-Rim hikers in the Grand Canyon. Your participation is voluntary and your responses will be anonymous. If you are planning on participating in a Rim-to-Rim hike, would you be

willing to participate in a study throughout the course of your hike?"

If YES: "Thank you. Throughout your hike we will conduct a total of three interviews, one here at your starting trailhead, one at Phantom Ranch, and one at your ending trailhead. Please wear and keep this wristband visible at all times because it will help to identify you as a participant in this study. Because we are also studying the nutritional strategies of hikers we would like to ask you to please keep all food wrappers or disposable beverage containers and give them to the surveyor at the next station. Again, thank you for your participation and happy trails!"

If NO: When a visitor does not wish to participate in the study, they will be asked the following non-response questions to allow us to assess for non-response bias:

"Thank you. Do you mind answering three short questions to help us analyze our data later?"

If YES to non-response questions:

1. Have you hiked R2R before today?
Yes/No/Do not wish to respond"
2. "In what year were you born?
19____"
3. Where do you live?
City_____State_____ZIP_____Country (if not
US)_____"

If NO to non-response questions: "Thank you, I hope you enjoy your visit."

(d) Expected Response Rate/Confidence Levels:

A total of 1,071 Rim-to-Rim hikers will be intercepted at the beginning of their hike at one of three trailheads (Bright Angel, South Kaibab, or North Kaibab). Based on previous on-site surveys conducted in GRCA (Backlund et al 2006; Steward & Cole, 1997), a final response rate of 85% could be anticipated. However due to the nature of the study with a total of three planned interviews during this R2R hike instead of one interview at a single station –as designed in the Backlund study—, we anticipate a lower final response rate of 70%. The number of refusals will be documented in the survey log and used to calculate a response rate. A 70% response rate will yield approximately 750 completed interviews overall. We are anticipating a confidence level at 90%.

Number of Initial	Expected	Expected	Margin
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Contacts	Response Rate	Number of Responses	of Error +/- %
1,071	70%	750	10%

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

Surveyors will use an on-site contact log to document sampling location, time of day, gender, and comments, if any, regarding reason for refusal. We will ask all those refusing to participate in the dull study to answer the three non-response questions listed above.

Analyses will be performed to determine if respondents differed significantly from non-respondents, and the implications, if any, for interpreting the results will be discussed. If necessary, data weighting may be applied during the analysis phase.

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

Survey research methods and the questionnaire instrument were reviewed by NPS officials. The methods and instrument have also been reviewed by Dr. Jon Femling, MD, PhD, University of New Mexico Department of Emergency Medicine; and Dr. Hannah Heinrich, PSAR Science Advisor and research advisor for the German Delegate, European Union. The majority of interview question are either identical or variations to those used in previous studies in several other national park studies and also appear in the NPS Pool of Known Questions (OMB Control Number 1024-0224). Those that are not variations are scientifically founded questions that have been approved by both Dr. Femling and Dr. Heinrich.

Burden Estimates: We plan to approach 1,071 individuals during the sampling period. With an anticipated response rate of 70%, we expect to receive 750 total responses for this collection.

We expect that the initial contact time to invite the individual to participate in the study will be at least 1 minute per person (1071 x 1 minute = 18 hours). We expect that 321 (30%) visitors will refuse to participate during the initial on-site contact, for those individuals we will collect the information for the non-response bias check described above. This is estimated to take an additional minute per respondent (321 x 1 minute = 5 hours).

We expect that 750 people will agree to complete the process. With that, we estimate that it will take 12 minutes to complete the process (5 minutes at starting trailhead, 2 minutes at Phantom Ranch Ranger Station, and 5 minutes at ending trailhead) (750 response x 12 minutes = 150 hours). The total burden for this collection is estimated to be 173 hours.

Estimated Number of Contacts		Estimation of Time		Estimation of Respondent Burden	
Total Number of Initial Contacts	1,071	Estimated Time (mins.) to Complete Initial Contact	1	Estimated Burden Hours	18
Estimated number of on-site refusals	321	On-site Refusal/nonresponse	1	Estimated Burden Hours	5
Total Number of Responses	750	Time to complete the three surveys	12	Estimated Burden Hours	150
				Total Burden	173

11. **Reporting Plan:** Analysis and results will include frequency distributions and descriptive statistics for all questionnaire variables as well as selected cross-tabulations and other comparisons. Depending on the variable, appropriate statistical analyses will be conducted, including correlations (Pearson's rho), Chi-square, Analysis of Variance (ANOVA), factor analysis, and scale reliability analysis.

Electronic version (in PDF and MS Word file formats) of the completion report will be provided to the park representatives, NPS Denver Service Center; and the NPS Social Science Program for inclusion in the Social Science Studies Collection within 12 months after the collection is completed.

References

- Backlund, E. A., Stewart, W., Schwartz, Z., & McDonald, C. (2006). Backcountry day hikers at Grand Canyon National Park. Champaign, Ill.: University of Illinois.
- Stewart, W., and Cole, J. (1997). Bright Angel Trail Day-Hiker Study: A Preliminary Investigation. College Station, TX.: Texas A&M University.