

The 2014 Supporting Statement B for OMB 0596-NEW **Arctic National Wildlife Refuge Visitor Study**

B. Collections of Information Employing Statistical Methods

- 1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method to be used. Data on the number of entities (e.g., establishments, State and local government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.**

In 1977, about 300 visitors responded to a visitor study with contacts made by mailing surveys to customers of air taxis, from obtaining aircraft information from aerial surveys and from hunter license permits for the area that included the Refuge. An 86 percent response rate was achieved.

The target population for this study in 2015 will include recreation visitors and recreational hunters to the Arctic National Wildlife Refuge from June 1 to the end of October in 2015. The target population does not include local individuals living within the subsistence zone and visitors who are qualified to participate in subsistence activities in the refuge regardless of their current activity. These individuals do not consider themselves to be visitors at the Refuge because they live there. Recreational flight-seers that do not land in the refuge are not considered to be part of the study population.

Most visitors to the Arctic Refuge occur during the summer season of June, July and August; though there is some hunting on through September and into October. Visitor numbers are thought to have remained stable since 2001, with estimates ranging between 976 and 1088 commercially guided and/or transported visitors each year. Each commercially guided or transported visitor spends, on average, between 7 and 12 days in the Refuge. Because of the size of the Refuge and the unlimited number of entry points, it is difficult to estimate the number of independent visitors who come into the Refuge using their own planes, boats, or on foot, but we believe it is a relatively low number, perhaps about 200 individuals each year (visitor statistics from the Refuge's web site, USFWS data).

The number of commercial visitors (latest estimates)

Commercially guided hunters:	75	
Commercially transported but unguided hunters:	123	
Commercially guided recreational visitors:	543	
Commercially transported, unguided recreational visitors:		239
Independent visitors (<i>estimate - no direct count</i>)	200	
Estimated total population	1,180	

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2. Describe the procedures for the collection of information including:

- **Statistical methodology for stratification and sample selection,**
- **Estimation procedure,**
- **Degree of accuracy needed for the purpose described in the justification,**
- **Unusual problems requiring specialized sampling procedures, and**
- **Any use of periodic (less frequent than annual) data collection cycles to reduce burden.**

Sampling vs. Population Estimation

Because of the small population (maximum estimated at only 1,180 people) the sampling method will be designed to achieve a cluster sample (assumed heterogeneity of sample members) by systematically selecting sampling weeks to make contacts throughout the use season. With 22 total weeks, 50% systematic sample from a random start would produce 11 weeks of sampling and approximately 590 visitor contacts (and 65% response for 384 responses for analysis). Assuming that the response is not biased, a sample of 384 returned questionnaires is sufficient to obtain good representation of the population and to draw significant statistical conclusions and comparisons across types of use. If a random sample of 384 were selected from a large population, statistics for continuous variables could be estimated with a confidence interval of +/- 5% or less at a confidence level of 95%. This confidence interval and level is generally accepted as sufficient for peer-reviewed survey research. Researchers will contact the visitors through several known and previously tested channels, assuming that stratifying efforts to capture a heterogeneous sample of representatives from would represent the actual population.

Air taxi pilots are a primary contact point for most visitors to the refuge, and these pilots have been asked to distribute postcard invitations to participate in the study to each of their clients during each study week of the 2015 use season. Postcards handed to visitors by the air taxi operators or taken voluntarily at regional transportation hubs and federal agency visitor centers will ask the respondents for their contact information - both postal and email, and ask them for their preferred method of contact for participating in the study. The postcards will be self-sealing to protect confidentiality, include pre-paid postage, and will be addressed to be mailed to the study sponsors.

The returned postcards will be used to initiate participation in the actual study. All responses will be voluntary and confidential. Each respondent will then receive their choice of either an e-mail letter with a link to an electronic survey or be mailed a copy of the questionnaire booklet and a letter explaining the purpose of this information collection activity. Those receiving the mail back version will also get a pre-paid, addressed envelope to use for returning the questionnaire.

All mailings will come from the Aldo Leopold Wilderness Research Institute, where all databases will be maintained. Names and addresses of visitors will be destroyed upon completion of their returned survey. These items will not be held indefinitely or associated with any of the respondent answers for this type of information collection. A project manager in Alaska will work full-time to keep in contact with air

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taxi operators and visitor center operators in order to monitor contact levels and assure high contact success.

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Data Management

All data will be collected, stored in multiple copies, and archived according to established data management procedures at the Leopold Institute and the USDA Forest Service. The quality of electronic data entry from questionnaires will be verified by the project manager. Visitor contact information will be kept in strict confidence, will not be used for any purpose other than to mail questionnaires and requested study results, will not be released to anyone outside of the Leopold Institute, and will be destroyed at the end of the study.

Upon study completion the data collected from the interviews and questionnaires may be obtained from the Leopold Institute in a suitable electronic format along with proper documentation for secondary analysis. Long term plans at the Leopold Institute are to make all public domain data sets archived in a standard format and available for secondary analysis.

Analysis of Study Results

The quantitative data collected with the survey questionnaire will be analyzed for interpretation using the procedures described in this section of the study plan. The analysis of the data will be guided by the overall study goal and four specific objectives.

Study Goal - As part of understanding changes in visits and visitor characteristics called for in the study goal, basic descriptive statistics will be generated for all variables included in the questionnaire. The comparison data set does not exist from 1977, though a full report of data does exist. There was not an accurate count of total visitors in 1977 so no confidence intervals were developed. Means and other measures of central tendencies, along with distributions will be included in the 2015 description, but because the data will be an approximation of the population rather than a random sample, confidence intervals will not be calculated for the descriptive statistics. Written comments will be encouraged in the questionnaire responses and these will be arranged by topic and presented in an appendix to the report of results to lend further insight and understanding to the visitors and interpretation of the study results.

Objective 1: Basic descriptive statistics will be used to address the first study objective to “understand change in visitor backgrounds and trip characteristics.” Objective 1a calls for demographic information and history of use. These are measured in the Section E of the survey instrument. Objective 1b is to assess trip characteristics, which are measured in Section A of the survey.

Objective 2: Objective 2 describes important desired elements of visitor experiences and some things that impact them. These items are contained in Sections B and C.

Objective 3: This objective describes the visitor response to potential management actions that could be used to protect visitor experiences and the resource. Visitors will be segmented in various ways to try to understand variation in response to these items. First, some data reduction will be performed on the items in Section B

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that characterizes the things visitors think are important. Segments will be compared in their support levels of various management tactics.

All data reduction (factor analysis or cluster analysis) will begin with using regression analysis to impute missing values in scale items by regressing on all other items within the same question. The imputation of missing values will maximize the number of cases that can be considered in the subsequent modeling process, as observations with any missing data are dropped from the models. Imputation is followed by conducting factor analysis on the experience dimensions (Section a). The factor analysis reduces the number of items within a dimension to a smaller number of robust sub-dimensions. High factor loadings will identify good indicators for future monitoring of influence dimensions. Correlation analysis will be used to develop general understanding of relationships between experience dimensions and factors of influence from Section C. The final step will be to use regression analysis to develop predictive models of support for management options (measured in Section D) based on the experience dimensions and factors of influence (Sections B & C).

3. Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.

Response to the on-site contacts is expected to be high and therefore adequate to meet the purpose of the study. If 590 contacts can be made with visitors, we anticipate that at least 80% (480) would respond positively by providing mail or e-mail contact information. It is common for 70-95% of a sample of visitors contacted at wilderness locations to agree to participate in a study. Unfortunately not all of those agreeing to participate on-site will complete and return the questionnaire at a later date.

It is believed that the primary reason that some do not mail the questionnaire back is due to a belief that since they may not participate in recreation often at that particular place, their opinions may not be important. Follow-up mailings are used to convince them otherwise. Past response rate examples for surveys conducted by the Leopold Institute include the Boundary Waters Canoe Area Wilderness (OMB 0596-0208) (74% response), Shining Rock Wilderness (OMB 0596-0108) (75% response), Desolation Wilderness (OMB 0596-0108) (83% response), and Gates of the Arctic National Park and Preserve (OMB 0596-0108) (95% response).

We will use a modification of The Tailored Design Method (2000) by Don Dillman, which precisely documents the appropriate ways to assure high response rates in mail back and e-mail surveys in social research. Dillman's methods have been used in many dispersed recreation visitor studies and have produced consistently high response rates. Dillman provided guidelines for writing initial and subsequent cover letters in which a justification of the information collection effort appears along with an appeal for response based upon the importance of each individual sampled to respond for a larger population of people represented. Following this approach, we will send an initial mailing (e)mail of information, a postcard reminder or email

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reminder in one week, and a follow-up (e)mailing of the questionnaire and appropriate cover letter in three weeks. Subjects will only receive a mailing related to one trip during the study, with screening prior to mailing to assure no visitor receives multiple mailings.

Whether or not a minimum response rate of 65% (of 590 contacts) is obtained using these methods, on-site responses for respondents and non-respondents will be compared. Enough basic information is being collected from all people through the initial contact post card to test whether the respondents and non-respondents differ to a significant degree on basic demographic factors and area visitation patterns. If non-response bias does exist, patterns will emerge and decisions can be made about weighting data or including qualifying statements about generalizability of findings.

The chief statistical consultant for analysis and interpretation of results for this study will be Scott Baggett, Station Statistician, Rocky Mountain Research Station, Ft Collins, Colorado.

4. Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.

While a small portion of the test instrument is intended to replicate the survey used in 1977, the larger portion comes from previous, recent surveys at other Alaska areas, including Gates of the Arctic National Park and Preserve (OMB 0596-0108) and Denali National Park and Preserve (OMB 0596-0108). Some changes have been made due to suggestions made by managers and peer reviewers. There are also some additional items to capture some issues unique to the purpose of this study or the Arctic National Wildlife Refuge and of interest to managers there.

Pilot testing of methods of contact and analysis was conducted in 2008. As a result of that testing, more intensive efforts to contact visitors, hire an additional person to monitor progress and make sure pilots and kiosks have supplies of contact information have been planned. Additional funding has been obtained and plans are proceeding to hire this person in Fairbanks, Alaska. Analysis for the survey is much simpler than for the pilot test due to simplification of the survey and the objectives being addressed.

5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

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