

**Socioeconomic Research and Monitoring Program in Florida Keys National Marine  
Sanctuary: Recreation/Tourism in the Florida Keys: A 10-year Replication**

**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 governmental units, households, or persons) in the universe and the corresponding sample are to be provided in tabular form. The tabulation must also include expected response rates for the collection as a whole. If the collection has been conducted before, provide the actual response rate achieved.**

**a. Resident Mail Survey**

In 1995-96, the Resident Survey was done using a combination telephone and mail survey. Basic demographics and participation in outdoor recreation in the Florida Keys was obtained by random digit dialing, which achieved a response rate of 66 percent. Detailed activity participation and use; expenditures, importance-satisfaction ratings; and environmental concern were obtained by a follow-up mail survey with a net response rate (telephone and mail) of 25 percent.

The current resident population of Monroe County is estimated at about 80,000 living in about 37,000 households. We plan to achieve at least 5,000 completed questionnaires out of the 37,000 households. This time a mail survey will be used by purchasing samples from either Survey Sampling, Inc. or Info USA and sending out a mail survey. The Dillman Method will be used with a pre-notification letter. A pre-notification letter will be sent out followed by a mailing with the full survey package. After two weeks, all those who have not responded will be sent a post-card reminder. After one month, all those who have not responded will receive the full survey package. We expect to achieve between 50 and 60 percent response rates.

The resident survey, as explained in Part A, is done in three samples of 1,000 completes and one sample of 2,000 completes, assuming a 50% response rate or 6,000 completes assuming a 60% response rate. Within samples, there are different versions. Table 4 shows the different versions, number of mail outs planned and the expected number of returns per version at both the 50 and 60 percent response rates.

**Table 4. Resident Mail Survey: Expected Completes**

Survey Version	Response Rates <sup>2</sup>		
	# Mailed Out <sup>1</sup>	50%	60%
1	2,000	1,000	1,200
2a <sup>3</sup>	500	250	300
2b	500	250	300
2c	500	250	300
2d	500	250	300
3	2,000	1,000	1,200
4a <sup>4</sup>	667	333	400
4b	667	333	400
4c	667	333	400
4d	667	333	400
4e	667	333	400
4f	667	333	400
<b>Total</b>	<b>10,000</b>	<b>5,000</b>	<b>6,000</b>

1. Will purchase household mailing list from Sample Survey, Inc. or Info USA.
2. Assumed range of response rates using full Dillman Method plus pre-notification letter. Will send pre-notification letter followed by full survey. Two weeks later, for those who have not responded, a post-card reminder will be sent. After one month, for those who still have not responded, another full survey package will be sent.
3. The Global Climate Change/Coral Bleaching module of questions are included in Version 2 and there are four versions.
4. The Substitution/Management Alternatives module of questions are included in Version 4, which has six versions of the choice questions.

### **b. Visitor Survey: Auto, Air and Cruise Ship Survey (Sample 1)**

The Auto, Air and Cruise Ship Survey (Sample 1) will be done the same way it was done in 1995-96 with only a few adjustments for changes in institutional structure (e.g. Marathon Airport now doesn't have commercial flights but has private planes). This survey is a stratified random survey with stratifications by season (summer and winter), type of day (weekday, weekend, and holiday), and mode of access (auto, air and cruise ship). There is an on-site survey and a mailback survey. In the mailback survey, respondents are asked to participate in two mailbacks; the expenditure and satisfaction mailbacks.

We don't know a priori how to exactly stratify the sample since this requires knowing how many visitors there will be in each season. The project will estimate the number of person-trips and person-days of visitation by season and mode of access. See Leeworthy (1996) for how this was done in 1995-96. In recent years, the cruise ship portion of visitation has grown rapidly going over the one million mark in 2004. In 1995-96, there were 312 thousand cruise ship passengers. So cruise ship passengers have increased as a share of visitors. We have used a combination of the 1995-96 results and the increase in cruise ship passengers to arrive at a sampling stratification. The data will later be post weighted for estimates of the actual distribution. Table 5 shows the sampling stratifications for the on-site component of the survey and the expenditure

and satisfaction mailback expected number of completes under different expected response rates.

Again, our definition of seasons is based on past research in South Florida. The summer season is defined as June through November and the winter season is defined as December through May. The summer season sampling will take place from mid-June through the end of August and the winter season sampling will take place from mid-January through the end of April.

The on-site sample expected number of completes is based on 1995-96 number of completions per sampling day/season/mode of access. About 40 days per season will be surveyed in the auto mode of access, with each day sampling four hours per day alternating between morning and afternoon sampling. Air surveys are done about 20 days during the summer season and 35 days during the winter season. Times of day will depend on flight schedules, which will be obtained from airport managers. Cruise Ships will also be done about 14 days during the summer season and 10 days during the winter season, but will depend on the schedule of port calls, which will be obtained from the Key West Port Authority. See Leeworthy (1996) for calendars of how days and times were chosen in 1995-96 study for all three modes of access.

Contingency planning is required for the auto survey for days delayed or cancelled due to rain. In addition, all surveying may end due to hurricane evacuation. This happened in 1995-96. Interviewers, who all have recreation vehicles and stay in campgrounds, had to be evacuated to a campground in central Florida. By law, all those in recreation vehicles must be the first to evacuate 24 hours before the storm is predicted to arrive. Make-up days are later scheduled.

In 1995-96, the expenditure mailback response rate was 37.9% in the summer season and 46% during the winter season, while the satisfaction mailback response rate was 47.1% in the summer season and 52.6% in the winter season. There was a learning effect in the 1995-96 study about how to improve mailback response rates from the summer to the winter survey. So we are basing our expected mailback response rates on the 1995-96 results and provide a range of results. Even though we hand both the expenditure and satisfaction mailbacks to the same people, response rates are always higher for the satisfaction mailback. We think we might be able to further narrow the difference by utilizing the short version of the expenditure mailback for those who are on day trips. We use a range of 45-50% for expenditure mailback response rates and 50-55% for the satisfaction mailback (Table 5).

**Table 5. Auto, Air and Cruise Ship Survey: Proposed Sampling (Expected Completes)**

Survey/Season	Mode of Access						Total
	Auto	Auto %	Air	Air%	Cruise Ship	Cruise Ship %	
<b>On-site Survey</b>							
Summer	1,280	68.1	300	16.0	300	16.0	1,880
Winter	1,720	72.6	350	14.8	300	12.7	2,370
<b>Subtotal</b>	<b>3,000</b>	<b>70.6</b>	<b>650</b>	<b>15.3</b>	<b>600</b>	<b>14.1</b>	<b>4,250</b>
<b>Expenditure Mail</b>							
			45 Percent Response Rate				
Summer	576		135		135		846
Winter	774		158		135		1,067
<b>Subtotal</b>	<b>1,350</b>		<b>293</b>		<b>270</b>		<b>1,913</b>
<b>Satisfaction Mail</b>							
			50 Percent Response Rate				
Summer	640		150		150		940
Winter	860		175		150		1,185
<b>Subtotal</b>	<b>1,500</b>		<b>325</b>		<b>300</b>		<b>2,125</b>
<b>Expenditure Mail</b>							
			50 Percent Response Rate				
Summer	640		150		150		940
Winter	860		175		150		1,185
<b>Subtotal</b>	<b>1,500</b>		<b>325</b>		<b>300</b>		<b>2,125</b>
<b>Satisfaction Mail</b>							
			55 Percent Response Rate				
Summer	704		165		165		1,034
Winter	946		193		165		1,304
<b>Subtotal</b>	<b>1,650</b>		<b>358</b>		<b>330</b>		<b>2,338</b>

**c. Visitor CUSTOMER Survey (Sample 2)**

As described in Part A, the Visitor CUSTOMER Survey (Sample 2) is a stratified random sample with stratification across 200 sites and stratification done with use of local knowledge as in 1995-96. Data is post-sample weighted using Sample 1.

One of the main objectives of the CUSTOMER On-site Survey is to estimate the intensity of use (measured in person-days of activity) by activity, by season and region (five regions). In 1995-96, we utilized 12 interviewers, who completed 1,781 on-site interviews in the summer season and 2,809 interviews for the winter season for an annual total of 4,590 interviews. Based on the

results of 1995-96 and the requirement to expand our estimates from four to five regions, we have planned to expand sample sizes to be able to reliably estimate days of activity for the five regions and seasons. To accomplish this we will expand the number of interviewers to 14. Table 6 shows our expected number of completes for the on-site survey to be 2,072 in the summer season and 3,276 in the winter season, for an annual total of 5,348.

In 1995-96, the CUSTOMER Survey had a mailback survey only during the winter season. This was done to achieve objectives of the University of Georgia's, Department of Applied Economics and was called the "Ecosystem Mailback Survey". In 1995-96, the "Ecosystem Mailback Survey" had a response rate of 53.5%. This time there are three mailbacks included in the CUSTOMER Survey for both seasons. Each of these was described in Part A. To achieve each project partner objectives, we determined what adequate sample sizes for each objective are, and then made sample allocations according to the following rules: Each respondent would be given two of the three mailbacks:

25% of the sample would be handed the KAP/Reef Valuation and Coral Bleaching mailback (N=601, assuming a 45% response rate).

25% of the sample would be handed the KAP/Reef Valuation and Substitution/Management Alternatives mailback (N=601, assuming a 45% response rate).

50% of the sample would be handed the Coral Bleaching and Substitution/Management Alternatives mailbacks.

So in total, 50% will receive the KAP/Reef Valuation for a total expected completed of 1,203 (assuming a 45% response rate); 75% will receive both the Coral Bleaching and Substitution/Management Alternatives mailback for a total expected completes of 1,804 for each mailback (assuming a 45% response rate). Given past experience, we might expect 50% response rates. Table 6 summarizes the expected completes under the two response rates.

**Table 6. CUSTOMER Survey Sampling (Expected Completes)**

<b>Survey/Season</b>		
<b>On-site Survey</b>		
Summer	2,072	
Winter	3,276	
<b>Total</b>	<b>5,348</b>	
	<i>Response Rates</i>	
	45%	50%
<b>Knowledge, Attitudes &amp; Perceptions/Reef Valuation<sup>1</sup> Mailback</b>		
Summer	466	518
Winter	737	819
<b>Total</b>	<b>1,203</b>	<b>1,337</b>
<b>Global Climate Change/Coral Bleaching Mailback<sup>1</sup></b>		
Summer	699	777
Winter	1,106	1,229
<b>Total</b>	<b>1,805</b>	<b>2,006</b>
<b>Substitution/Management Alternatives Mailback<sup>1</sup></b>		
Summer	699	777
Winter	1,106	1,229
<b>Total</b>	<b>1,805</b>	<b>2,006</b>

1. Each respondent is given two mailbacks. Half the sample gets the Knowledge, Attitudes, & Perceptions/Reef Valuation mailback and three-quarters of the sample get the Substitution/Management Alternatives mailback and the Global Climate Change/Coral Bleaching mailback. The Global Climate Change/Coral Bleaching mailback has four versions with sample size split equally across versions. The Substitution/Management Alternatives mailback has six versions equally split across the six versions.

**d. Supply-side Surveys**

***(1) Dive Shop Owners/Operators***

Under OMB Control Number 0648-0534, we are conducting a survey of Dive Shop Owners/Operators on their Knowledge, Attitudes & perceptions of Sanctuary Management Strategies and Regulations. We identified that there are currently 68 operations in the Florida Keys. The data collection is complete for that project and 65 of the 68 responded to the survey: a 95% response rate. We have designed a post card, four-question survey as a follow-up effort to this population. We expect a similar response rate. The President of the Keys Association of Dive Operators (KADO), Bob Holston, would like us to achieve 100% response rate (a Census) and is contacting all dive shops through out the Florida Keys and asking them to please participate.

## *(2) Cruise Ships*

We have never sampled the Cruise Ships themselves, only passengers of the ships that disembark the ships in Key West. Here we propose to ask a post-card, four question survey of each Cruise Ship business. The number of cruise ships and the number of cruise ship businesses are not necessarily the same, with the same company operating multiple ships that make a port call in Key West. We will work with the Key West Port Authority to contact all the cruise ship companies that have ships planning to make port calls over our study period. We expect this to be fewer than 20 companies that will receive the post card survey. We are expecting high response rates (over 90 percent).

**2. Describe the procedures for the collection, including: the statistical methodology for stratification and sample selection; the estimation procedure; the degree of accuracy needed for the purpose described in the justification; any unusual problems requiring specialized sampling procedures; and any use of periodic (less frequent than annual) data collection cycles to reduce burden.**

Sampling Procedures and Sample Selection: In Part A, Question 2, Section on “How”, sampling procedures and sample selection methods were described for each target population and survey of that population. In Part B, Question 1, sample stratifications were discussed for each survey. In Part A, Question 2, Section on “How”, we also described the special sampling stratification using local knowledge for the visitor CUSTOMER Survey.

Degree of Accuracy Needed: For all elements of the Resident and Visitor Surveys that are replicated from either the 1995-96 study or the 2000-2001 study, we have planned for sample sizes that exceed those achieved in previous studies that were successful, so we are confident estimates will be reliable for all of these project elements. For new project elements such as the Global Climate Change/Coral Bleaching, we are basing our selected sample sizes on other recent applications of the stated preference method used. Our planned sample sizes exceed those of most other applications so we are confident that we will be able to estimate values with acceptable statistical accuracy. For the new study on Substitution/Management Alternatives, the key aspect was sample size to support the choice questions. Dr. Chi-Ok Oh, Department of Parks, Recreation, and Tourism Management at Clemson University, designed the choice experiment and says that a sample size of 1,100 to 1,200 would meet minimum requirements for this module of questions, using his 48 choice question approach across six versions of the survey, with each version containing 8 choice questions for each activity (fishing and diving). We were able to allocate a sample size of 2,000 for the resident population and 1,804 for the visitor population, thus ensuring that statistical accuracy required will be achieved.

Frequency of Data Collection: This is a one-time application. The recreation/tourism study was recommended to be done approximately every ten years. Some sub-components, importance-satisfaction ratings, are recommended to be replicated every five years. Estimates of reef use were done in the 2000-2001 study and the FKNMS asked if we could update these estimates since reef use is a high priority given the recent declines in live coral cover due to bleaching events and various diseases.

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

a. Resident Mail Surveys: We use pre-notification letters and the full Dillman Method for mail surveys. A pre-notification letter is first sent, followed by the full survey package. After two weeks, those who have not yet responded will receive a post-card reminder with a telephone number to call to get another copy of the survey. After one month, those who not yet responded will receive a full survey package. A sweepstakes/lottery is also set up as an incentive. This will be run by the private sector as part of their contribution to the project. Prizes have not yet been determined or who will run the sweepstakes/lottery, but it will most likely be a local bank that runs the sweepstakes/lottery. We believe that following the above procedures will yield response rates between 50 and 60 percent (Table 4). We will have full demographic profiles of respondents and will be able to test for nonresponse bias (see Leeworthy, 1996 for tests conducted for nonresponse bias and sample weighting used to adjust for minor biases).

b. Visitor On-site surveys; Auto, Air and Cruise Ship and CUSTOMER: In both the 1995-96 and 2000-2001 studies, we achieve between 90 and 95 percent response rates for the on-site surveys of visitors. One of the main reasons we believe we are so successful is our use of the Bicentennial Volunteers, Inc. (BVI) as our interviewers. The BVI interviewers are typically retired Tennessee Valley Authority (TVA) personnel that volunteer their time for public projects. A group of these volunteers have their own recreation vehicles (RVs) and we negotiate with private or government campgrounds to provide free campsites to our volunteers. The volunteers, being elderly people, do not intimidate any socioeconomic group. The fact that they can approach any group without intimidation leads to high cooperation rates. The response to first contact is crucial to survey research and the BVI volunteers are very successful. The volunteers also help out with ensuring that businesses that are selected as interview sites allow our interviewers to interview their customers. Some sites that considered their sites catering to high income/high profile visitors did not at first think their customers could be bothered by surveys. However, after meeting our BVI Interviewers, all businesses allowed us to interview their customers. We were in fact successful in turning the interviews into a value-added experience. Many businesses and the Monroe County Tourist Development Council think the BVI interviewers are ambassadors for the Florida Keys.

We also believe the use of the BVI interviewers has increased our mailback response rates. Back in the mid 1980's we were using students to do the Public Area Recreation Visitor Surveys (PARVS). Because of quality problems, we switched to using the BVI in the late 1980s early 1990s. Not only did the quality of on-site interview data improve mailback response rates increased significantly.

c. Visitor Mailback Surveys; Auto, Air and Cruise Ship and CUSTOMER: In Tables 5 and 6, we show our expected response rates for the various mailback surveys in the two visitor surveys. Expected response rates are largely based on the experiences of 1995-96, but also the product of



some learning from the 1995-96 experience. From the 1995-96 experience, we learned that there was some nonresponse bias in the expenditure mailback of the Auto, Air and Cruise Ship Survey. The bias came from day-trippers. Day-trippers, except Cruise Ship passengers, were not differentiated from other visitors as to type of mailback questionnaire they were given. This time we will provide a short version (the one the Cruise Ship passengers get) to day-trippers. We think this will improve response rates for this group and eliminate nonresponse bias from day-trippers.

As in 1995-96, we will obtain the names, addresses and telephone numbers from many of the visitors during the on-site interview so we can do follow-ups to increase response rates. The Monroe County Tourist Development Council (TDC) provides small gifts to hand out to visitors. They also provide a bookmark/brochure that explains the sweepstakes/lottery and the potential prizes visitors can win by returning their completed mailback questionnaires. If they return both questionnaires, visitors are told it doubles their chances of winning.

We are also able to analyze the data for nonresponse bias as was done in 1995-96 and adjust for nonresponse bias, if present, by sample weighting (see Leeworthy, 1996 for analyses of nonresponse bias for all mailbacks and sample weighting used to correct for any bias).

**4. Describe any tests of procedures or methods to be undertaken. Tests are encouraged as effective means to refine collections, but if ten or more test respondents are involved OMB must give prior approval.**

Most of the questionnaire modules are replications of past work and required no testing. Although, the Substitution/Management Alternatives modules are new in the Florida Keys, they have been used in many other places successfully and are merely adapted for application in the Florida Keys. The Global Climate Change/Coral Bleaching is also a new application in the Florida Keys, but the general methods have been used in tested elsewhere and we are confident in the design. The only aspect we would have liked to test is the range of randomly assigned dollar amounts. We believe that we can draw on our past experiences with willingness to pay in the Florida Keys (2000-2001 reef valuation study, see Johns et al, 2003a) to derive the range without expensive pre-testing.

**5. Provide the name and telephone number of individuals consulted on the 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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## Overview of Questionnaires

- **Resident Mail Survey**
- **Visitor: Auto, Air and Cruise Ship Survey**
  - **On-site Survey**
  - **Expenditure Mailback**
  - **Satisfaction Mailback**
- **Visitor: CUSTOMER SURVEY**
  - **On-site Survey**
  - **Knowledge, Attitudes & Perceptions of Sanctuary Management Strategies and Regulations/Reef Valuation Mailback**
  - **Global Climate Change/Coral Bleaching Mailback**
  - **Substitution/Management Alternatives Mailback**
- **Supply-side Surveys**
  - **Dive Shop Owners/Operators – Post-card Survey**
  - **Cruise Ships – Post-card Survey**

## RESIDENT MAIL SURVEY

- **Sample 1/Version 1**
  - Questionnaire
  - Activities List (White Card)
  - Activities List – Reefs (Blue Card)
  - Map of Florida Keys (Five Regions)

Sample 1/Version 1 includes the core questions (Activity Participation and Use; Specialization; and Demographics); Trip Expenditures; Annual Vacation and Equipment Purchases; and Reef Valuation.

- **Sample 2/Version 2**
  - Questionnaire
  - Version 2a
  - Version 2b
  - Version 2c
  - Version 2d
  - Activities List, Activities List – Reefs and Map are the same as Sample 1/Version 1 and are not repeated here.

Sample 2/Version 2 has four sub-versions. The difference between versions is the choice questions for the Global Climate Change/Coral Bleaching Module. Each version has six choice questions, which are different combinations of management strategies. There are 24 different choice questions across the four sub-versions. This version includes the core questions; Satisfaction; Environmental Concern; and the Global Climate Change/Coral Bleaching.

- **Sample 3/Version 3**
  - Questionnaire
  - Activities List, Activities List – Reefs and Map are the same as Sample 1/Version 1 and are not repeated here.

Sample 3/Version 3 includes the core questions; and the Knowledge, Attitudes & Perceptions of Sanctuary Management Strategies and Regulations.

- **Sample 4/Version 4**
  - Questionnaire
  - Version 4a
  - Version 4b
  - Version 4c
  - Version 4d
  - Version 4e
  - Version 4f
  - Activities List, Activities List – Reefs and Map are the same as Sample 1/Version 1 and are not repeated here.

Sample 4/Version 4 has six sub-versions. The difference between versions is the choice questions for the Alternative Management Options Module. Each version has eight (8) choice questions for each of two activities (fishing and diving). Across the five sub-versions there are 48 different choice questions for each of the two activities. This version includes the core questions; Substitution; and Management Alternatives.