

SUPPORTING STATEMENT
U.S. Department of Commerce
National Oceanic & Atmospheric Administration
Economic Impacts of Reef Diving and Snorkeling
OMB Control No. 0648-0765

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.

The respondent universe that this survey will target includes individuals who have taken a dive or snorkel trip on a coral reef in Hawaii or coral reefs in U.S. territories during the past 12 months. As noted in Part A, we will employ two sampling strategies to target this audience: proportional random sampling and opportunistic sampling. For the proportional random sampling, we will mail a 1-page flyer briefly explaining the objectives of the survey and the importance of participating to a random sample of Hawaiian residents using an address-based sampling frame that we will purchase. The flyer will contain a QR code as well as a URL to the online survey instrument, where respondents can complete the survey. We will sample proportionally from mailing addresses on all islands excluding Lanai and Molokai. We expect that of the households that receive a flyer approximately 15% will have an individual who has participated in diving or snorkeling during the past 12 months. Of that number we expect that a conservative estimate of 5% will complete the survey.

For the opportunistic sampling, we will provide flyers to local dive and snorkel trip operators as well as staff at local marine parks to distribute to their patrons so that they can participate in the survey. This sampling is targeted at non-resident visitors who took a coral reef dive or snorkel trip during their visit to Hawaii or other U.S. territories. Flyers will contain a distinct QR code and URL so that data collected from the opportunistic sample can be analyzed separately from the data collected via the random sample.

We have enlisted the help of a number of tour operators and state and local marine parks in Hawaii and will engage similar operators and staff in U.S. territories. Based on previous experience using an opportunistic sampling strategy (the economic expenses of diving and snorkeling on South Florida reefs OMB Control No. 0648-0746) we find that staff are very willing to help distribute flyers and participate in the collection, as their livelihoods are reliant on coral reefs.

For the South Florida survey we received over 2,400 completed surveys using an opportunistic sampling approach and similar outreach methods to engage tour operators, dive shop staff, and marine park staff. We expect to receive a similar number - approximately 2,000 completed surveys - from the opportunistic sample targeting non-residents who are visiting reefs in Hawaii or U.S. territories. As our online survey format in Florida did not record a response unless it was completed we cannot calculate the number of survey links that were opened by individuals, therefore we do not know the number of surveys that were distributed.

ENTITIES IN THE RESPONDENT UNIVERSE

Entities	Description of Sampling			
Residents on Target Islands	Total target population*	Number of postcards mailed	Expected response rate	Expected number of respondents
Oahu	974,563	20,650	5%	1,033
Kauai	72,293	1,532	5%	77
Maui	167,417	3,547	5%	177
Hawaii	201,513	4,270	5%	213
TOTAL	1, 415,786	30,000		1,500
Non-Resident Visitors	Number of fliers distributed	Expected response rate		
Dive/Snorkel Tour Operators, State and Local Marine Park Staff, Dive Shops, other entities engaged in coral reef conservation	10,000	20%		2,000
TOTAL NUMBER OF COMPLETED SURVEYS				3,500

*As reported by the US Census Data, 2020 https://census.hawaii.gov/census_2020

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.

As described above, in order to reach the target population we will survey a proportional random sample of Hawaiian residents and employ an opportunistic sampling approach to reach non-residents.

We will survey a proportional random sample of Hawaiian residents on all islands except Molokai and Lanai. We excluded these two islands simply due to their small resident populations and comparatively few visitors. We will purchase an address-based sample of 30,000 addresses (sampled proportionally to the populations from each island) from Marketing Systems Group, and will mail potential respondents a 1-page flyer briefly explaining the objectives of the survey and the importance of participating. The flyer will contain a QR code as well as a URL to the online survey instrument, where respondents can complete the survey. We will distribute the 30,000 purchased addresses proportionally across the four islands. The sampling strategy will maintain fundamental statistical properties associated with proportional random sampling.

The decision to purchase 30,000 addresses was based primarily on financial considerations, assumptions concerning participation and response rate, and the number of observations we would like to have in order to be able to calculate average expenditures.

Currently no sampling frame exists that would allow us to identify and mail a postcard containing the survey link to Hawaiian residents who took a dive or snorkel trip on a coral reef during the last 12

months. We have made an assumption that 15% of households that receive a postcard will have a resident that snorkeled or dove during the past 12 months based on conversations with staff from the Pacific Islands Fishery Science Center and active divers currently residing on Oahu and a 2013 report from Dive Equipment and Marketing Association (DEMA). This report estimated that the number of snorkelers in the US was about 11 million and the number of scuba divers was about 2.7 million (<https://c.ymcdn.com/sites/www.dema.org/resource/resmgr/imported/Diving%20Fast%20Facts-2013.pdf>); in 2013 these two numbers combined represented about 4.3% of the US population. Given that Hawaii is likely to have a much larger proportion of recreational divers and snorkelers than the general U.S. population, combined with our discussions with Hawaiian residents and staff at the Pacific Islands Fishery Science Center, we believe a 15% participation rate is reasonable. We expect a 5% response rate from those residents who receive the postcard with the survey link and participated in diving or snorkeling during the last 12 months.

The entities described in the table in Q1 above will assist us in distributing a flyer containing a URL and QR code for the online survey targeting non-resident visitors. There will be no a-priori stratification of the opportunistic sample; however, post stratification of the data may be possible based on survey responses (e.g., frequency of dives, demographic characteristics). We expect the response rate to be higher for non-resident visitors as this group will already be engaging in snorkeling, diving, or other marine-related recreation and will be encouraged to complete the survey at the intercept site on any mobile device. As our target number of responses from the non-resident group is 2,000 and our expected response rate is 20%, we will print and distribute 10,000 flyers to dive and snorkel operators and staff at marine parks.

Our target survey population of individuals – residents and non-residents – who have participated in diving or snorkeling during the last 12 months presents a unique problem, as there is no existing sampling frame for these individuals. In our experience we have found that tourism operators are very keen to help distribute the survey, but very reluctant to provide mailing addresses for their clients, for reasons that are fairly clear. We have contacted PADI and NAUI dive certification organizations and they too are eager to distribute the survey but reluctant to provide personal information on their clients. Therefore the sampling approaches we have proposed are currently the only alternative for specifically reaching divers and snorkelers. In addition, our approach of using a postcard at the initial contact for both sampling approaches is much less expensive than sending a printed full survey or conducting an in-person or telephone survey, and therefore is a cost-effective approach. Nevertheless, we recognize that at least for the non-resident population the inferential properties are very limited.

We will analyze the data from the random sample of residents and the opportunistic sample of non-residents separately. We will use IMPLAN models from each dataset to estimate the economic impacts of diving and snorkeling on Hawaii's reefs. We will use SAS software to compute standard statistical measures for each question, e.g. mean, standard deviation, frequency counts, etc.

The IMPLAN model will rely on an average estimate of expenses in a number of different categories, and therefore does not require any specific number of responses. The precision of the IMPLAN estimates will increase as more observations are used to compute the average expenditures – or as the variance of the average decreases. We believe that 1,500 responses for residents and 2,000 responses for non-residents will provide solid and robust averages to use in the IMPLAN models. Further, we will be able to present our results in several ways: the average expenditure estimates calculated directly from the data; the economic impacts calculated specifically from our sample; and the economic impacts extrapolated from our sample to the assumed number residents or visitors who participated in diving and snorkeling on a reef during the last 12 months. This will allow those using our results to state specifically the limitations of the data.

This frequency of this data collection is not less than one year, thus the last bullet does not apply.

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.

We have taken steps to maximize the number of surveys completed, including making the survey a brief, concise, and clear instrument, limiting the number of open-ended questions, tailoring questions by using skip patterns in the online instrument, and revising the survey based on feedback from a focus group conducted in Hawaii. In addition we will involve a number of professional dive and snorkel operators and other outreach activities to help increase response rate. For example, postcards will be distributed at the Honolulu International Airport, in dive shops on Oahu, Maui, and Hawaii Island, and at appropriate expos. Staff at the Pacific Islands Fishery Science Center (PIFSC) will also share the link to the website, in emails to the PIFSC staff, with dive shop social media websites, and through the Hawaii Sea Grant College staff. Similar outreach efforts will be employed for U.S. territories.

In this data collection it will not be possible to address non-response, as we collect names only from those individuals who respond to the survey.

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.

We have conducted a focus group with 8 scuba divers and snorkelers in Honolulu, HI. Their feedback was used to revise language and questions in the survey and to ensure that material is understood and interpreted by the respondent as intended. For example, feedback from the focus group was used to modify the way the expenditure tables were presented to respondents. Prior to the focus group the expenditure tables contained all categories of expenses; however, focus groups revealed that many participants only had expenditures in one or two categories, and stopped writing a "0" in for expenditures for many of the categories, instead just leaving them blank. This is problematic as the analyst cannot determine whether they truly had zero expenditures on the item or just did not remember. To avoid this situation we revised the question to a two part question that allowed us to ask for expenditures only if the respondent said that they bought something in that category. This shortened the survey considerably.

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.

Design:

Kristy Wallmo, NOAA Fisheries, 301-257-9653

Sabrina Lovell, NOAA Fisheries, 301-706-9496

Mariska Weijerman, NOAA Fisheries, 808 725-5468

Analysis:

Sabrina Lovell, NOAA Fisheries, 301-706-9496
Kristy Wallmo, NOAA Fisheries, 301-257-9653
Noelle Olsen, NOAA Fisheries, 301-427-8140

Data collection: Gustavo Rubio, ECS Federal, contracting company, 301-427-8180