ATTACHMENT C: FOCUS GROUP REPORT

We received approval to conduct two focus groups of eight persons for each group for both residents of Puerto Rico and visitors to Puerto Rico who have used Puerto Rico's coral reefs for recreation (OMB Control Number 0648-0660, Expiration:02/29/2016).

The objectives of the focus groups were as follows:

1. Identify reef attributes people care about when they do recreation activities on Puerto Rico's coral reefs.
2. Identify levels of conditions of each attribute that would affect their economic value for coral reef use.
3. Check to see if Illustration and Scientific Bullets describing reef attribute conditions were consistent (i.e. tell the same story).
4. Identify and reef attributes not in the current list of attributes and their levels, if they affect their economic values.
5. For what attributes not in the illustrations are visual aids needed.
6. Maximum willingness to pay for different reef attributes' conditions. This to provide a starting point for designing the dollar bids for the pre-test choice questions.
7. Check to see if payment vehicle for willingness to pay might include some biases or result in scenario rejection.

A set of focus group materials was developed by NOAA, EPA and the University of Puerto Rico-Mayaguez. These are included here:

1. Focus Group Task/Script
2. Definition of coral reef ecosystems and conditions (CORAL REEF DEFINITIONS and CONDITIONS CARD.
3. Reef Activities List
4. Attributes important to different recreation activities on the reefs. Table focus group members fill-out.
5. Attribute levels and if willingness to pay changes with attribute levels. Table focus group members fill-out.
6. Illustrations of coral reef conditions (Low, Medium and High). See Appendix D.
7. Willingness to Pay Card.
8. Demographics Card.

Focus Group Results

The University of Puerto Rico – Mayaguez recruited focus group members and conducted the focus group interviews under the guidance of Dr. Miguel del Pozo, Project Leader under contract to NOAA's Office of National Marine Sanctuary. Dr. Vernon R. (Bob) Leeworthy is the overall Project Leader and attended the first resident focus group as an observer.

The original plan was for four focus groups; two for residents and two for visitors with each consisting of eight members. However, it proved difficult to assemble focus groups, especially visitors during the low season despite incentives. For residents, two groups of 6 for a total of 12 people participated. For visitors, instead of groups, seven one-on-ones were conducted. Dinner was provided for each participant in a "comfortable and appealing setting". Focus group sessions lasted 2 hours for each session and all tasks were completed.

Task 1: Identify reef attributes people care about when they do recreation activities on Puerto Rico's coral reefs.

Both residents and visitors thought we should consider surfing, wind surfing, kite boarding and paddle boarding as reef using activities. Focus group members mentioned issues of clean water that healthy for swimming as an additional important attribute and that depth of coral reefs was important. They thought that sponges and soft corals could be combined for diversity and abundance.

Task 2: Identify levels of conditions of each attribute that would affect their economic values for coral reef use.

Both residents and visitors thought the levels of each attribute were good and moving from low to medium conditions and medium to high conditions would change their economic values. There was on possible exception and that was soft corals and sponges. Several focus group members thought that more soft corals and sponges would increase their economic values even though the scientific information provided suggests that they are predominant where water quality conditions are of lower condition and hard corals are significantly reduced or eliminated.

Task 3: Illustrations and Scientific Bullets - Are they consistent (i.e. tell the same story)?

Both resident and visitors agreed that the illustrations and scientific bullets were giving a consistent story on the relative condition of reef attributes. Some wanted to see more soft corals and sponges in the low condition illustration. This is being done.

Task 4: Reef Attributes not included in illustrations – Do we need some visual aids for these attributes?

Both residents and visitors wanted us to add depth of the reefs and water cleanliness (healthy for swimming or not healthy for swimming and no visual aids were needed for these attributes.

Both residents and visitors wanted some photos in the introduction of hard corals (stony corals), soft corals and sponges, fish and invertebrates, and mega fauna (large animals/predators) that one might see on a Puerto Rican coral reef.

Both residents and visitors thought we needed an additional visual aid for the issue of crowding. They thought that it did not have to include number of boats on the water or number of people in the water, but should just have different number of people such as on a beach in Puerto Rico. Some even said it didn't necessarily have to be a beach in Puerto Rico. We took a picture of a Puerto Rican beach a Photo-shopped in different numbers of people to the three different levels of crowding that have affected people's satisfaction ratings in other studies.

Residents and visitors did not think a visual aid was needed for water clarity/visibility, the bullet descriptions were sufficient.

Task 5: Bid Amounts for Willingness to Pay for different reef conditions

Residents and visitors understood the task after the explanation was provided that it wasn't natural to reveal their maximum willingness to pay, but we needed them to help us design the survey by providing their maximum willingness to pay. Results were surprising. We expected that visitors would have higher willingness to pay than residents as visitors have significantly higher incomes. With the small sample sizes (7 visitors and 12 residents), there wasn't a statistical difference between visitor's and resident's willingness to pay. There wasn't a clear relationship between any socioeconomic/demographic factor and willingness to pay. In the pre-test, we therefore will use the same range of bids to help design the final bids for the choice questions.

Residents (N=12): Moving from low to medium attribute conditions ranged from $0 to $500 with a mean of $172.92, a median of 50. Actual numbers (0, 0, 20, 25, 30, 50, 50, 200, 300, 400, 500, 500). Moving from medium to high attribute conditions ranged from $0 to $1,000 with a mean of $328.75 and a median of $92.50. Actual numbers (1, 10, 20, 40, 40, 85, 100, 250, 600, 800, 1000, 1000).

Visitors (N=7): Moving from low to medium attribute conditions ranged from $20 to $240 with a mean of $86.43 and median of $70. Actual numbers (20, 25, 50, 70, 100, 100, 240). Moving from medium to high attribute conditions ranged from $40 to $240 with a mean of $115.71 and a median of $100. Actual numbers (40, 80, 100, 100, 100, 150, 240).

Residents were more skeptical about the territorial government's ability to effectively use the funds obtained to manage the coral reefs. They preferred a federal agency or a private non-profit. They didn't like the use of direct user fees and generally accepted our payment vehicle as general increases in the price of goods and services. We added in some questions in the pre-test to further explore the possibility of vehicle payment bias.

Task 6: Background Questions about themselves.

Even though most of the residents answered the question on “RACE”, the group discussion was more negative. Puerto Rican residents have an ethnic identity, but not a racial one. Some wanted us to add categories such as: “mixed race” and “Afro-Caribbean”. Black Puerto Ricans may not identify themselves as “Afro-Americans” and prefer “Afro-Caribbean”. The problem with us changing categories is the requirement that we adhere to the Census categories in the OMB Guidelines for “Race”.

FOCUS GROUP TASKS/SCRIPT

Task 1: Identify reef attributes people care about when they do recreation activities on Puerto Rico's coral reefs.

1. Start out with a definition of coral reef ecosystems. (Handout) Brief discussion answering questions about definition.

2. Handout list of attributes and activities. Attributes are rows and activities columns. Ask focus group members to check which attributes are important to them for which activities.

   After they have completed.

3. Ask about any attributes not on the list that are important to them. Discuss.

4. Ask about attributes on the list that they don't think are important. Discuss.

Task 2: Identify levels of conditions of each attribute that would affect their economic values for coral reef use.

1. Start out with all attributes at *Low* conditions, all attributes at *Medium* conditions, and all attributes at *High* Conditions (Handout with *Low*, *Medium* and *High* conditions for each attribute).

   Explain that the conditions were derived from EPA-NOAA research on Puerto Rico's coral reefs.

2. Have them check columns indicating if their values for reefs would change if each attribute condition changed from Low to Medium and from Medium to High.

3. For those attributes where moving from *Low* to *Medium* conditions would not change their values, discuss what levels conditions would have to reach to change their values.

4. For those attributes where moving from *Medium* to *High* conditions would not change their values, discuss what level conditions would have to reach to change their values.

Task 3: Illustrations and Scientific Bullets - Are they consistent (i.e. tell the same story)?
(Handout illustrations and scientific bullets of each reef condition).

1. Do the illustrations capture the conditions specified in the illustrations for each condition level (*Low*, *Medium* and *High*)?

2. Do the illustrations show significant differences across the *Low*, *Medium* and *High* conditions?

3. Do the illustrations show improvements in reef conditions moving from *Low* to *Medium* and *Medium* to *High* condition?

Task 4: Reef Attributes not included in illustrations – Do we need some visual aids for these attributes?

1. Water clarity/visibility
2. Number of other users on the reefs

Task 5: Bid Amounts for Willingness to Pay for different reef conditions

1. First provide handout with payment vehicle (i.e., how reef users will pay for reef protection and restoration). Discuss and answer any questions.

2. Determine *Maximum* amount they would be willing to pay per year to move from *Low* to *Medium* conditions on all of Puerto Rico's coral reefs?

   If all conditions could be maintained or increased from the Low condition to the *Medium* condition,

What would be the maximum your household would be willing to pay per year and still maintain your current level of reef use? $ _____.

If all conditions could be maintained or increased from the *Low* condition to the *High* condition,

What would be the maximum your household would be willing to pay per year and still maintain you current level of reef use? $ _____.

3. Discuss the idea of willingness to pay improving reef conditions. What do they think are reasonable amounts? Open discussion. If they think the government can't be trusted to spend the money on protecting and/or restoring coral reefs, discuss how they think it should work. Should the money go into a trust fund that a non-governmental organization manages to protect and restore the reefs?

Task 6: Background Questions about themselves.

Activity on the Reefs

1. How many days have you used Puerto Rico's coral reefs during the last 12 months for your recreation activities? _____ (Number of days)

2. Handout Blue Card with Water-based Activities. Referring to the Blue Card, could you write down all the numbers for activities you do on Puerto Rico's coral reefs?

Demographics

1. Hand out the Demographics Card. Ask if they would write down the letter on the Green Card that best describes them. Age, Race, Education Level, Employment Status, Household Income

End. Thank them and handout any gifts or payment for attending.

CORAL REEF DEFINITIONS and CONDITIONS CARD

Definitions

Coral reefs are colonies of connected skeletons of millions of small animals called corals.

Coral reef ecosystems include the coral reefs, neighboring areas of sea bottom, ocean waters, sponges, algae, seagrasses and mangroves.

- **Coral reef ecosystems provide a place to live for many ocean species including, fish, sea turtles, conchs, lobsters, sponges, urchins, and marine mammals like dolphins and manatees.**

- **Most coral reef ecosystems in Puerto Rico are in water less than 60 feet deep.**

Conditions

- **Research by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) has measured the abundance and diversity (number of different species) of stony corals, soft corals, sponges, fish, macroinvertebrates (conch, spiny lobster, and urchins) on Puerto Rico's coral reefs.**

- **Measures of abundance and diversity were measured on how much was there per square meter of coral reef area.**

- **For abundance, the following measures were taken:**

  - **Stony corals: Percent (%) of hard-bottom covered per square meter and percent of the coral tissue is alive.**
  - **Soft corals and Sponges: Square centimeters per square meter of reef area.**
  - **Fish: Number per square meter.**

  Fish were classified into fish people eat (consumptive) and fish that people just view (Tropical/Ornamental fish). A few fish that normally would be classified as consumptive were not counted as consumptive because of ciguatera poisoning. Fish were also classified as Sport/Trophy fish (ladyfish, permit, bonefish, tarpon, barracuda, jacks). Some of these may be known to have ciguatera poisoning but are still fun to catch.
  - **Consumptive fish: Puerto Rico has only a couple of species with limits on length to be legal for keeping (Yellowtail snapper, White Grunt, silk snapper, and black snapper). Some are permanently closed (Nassau grouper and Goliath Grouper). Still others have closed seasons (silk, vermillion, black and blackfin snappers Oct. – Dec.; mutton and lane snappers April-May; Red Hind Dec. –Feb.). We present the number of consumptive fish that meet legal size for keeping per square meter of reef area.**
  - **Tropical/Ornamental fish: Number of fish per square meter.**
  - **Sport/Trophy fish: Opportunity to catch or see trophy fish on the entire reef not the number per square meter.**

- **Macroinvertebrates (conchs, spiny lobsters, and urchins): The number per square meter. For conchs, the maximum number observed was 33 per square meter, while for spiny lobster, the maximum**

observed was 7 per square meter. Urchins tend to be observed in much higher numbers. For Long-spined urchins, the maximum observed was 81 per square meter, while for smaller species of urchins as many as 375 per square meter have been observed. Seasonal closure of Queen Conch July – Sept.

CORAL REEF ECOSYSTEM HEALTH

- **Urchins are known to increase the health of reefs for stony corals**.

- **Stony corals are dominant in the most healthy reefs.**

- **Soft Corals and Sponges tend to dominate in reef areas where the water quality is relatively poor. So scientists find that soft corals and sponges are more able than stony corals to thrive in relatively poor water quality and move into places where stony corals have died.**

- **Soft Corals and Sponges are often very colorful, serve as important habitat for fish, and help improve water quality by filtering nutrients that can reduce algal growth that can smother reefs and improve water clarity/visibility.**

- **Most of the coral reef ecosystems in Puerto Rico are currently in a fair to poor or low condition. Overfishing, water pollution, careless anchoring, and sediments from runoff from development and agricultural areas have been the most important factors damaging the coral reef ecosystems.**

Coral Reef Attributes Importance to Recreation Activities

Reef Attributes	Activities				
Corals and Sponges	SCUBA Diving	Snorkeling	Fishing	Glass-bottom Boat Ride Wildlife Viewing	Surfing, Windsurfing, Kite Boarding
Stony coral cover (percent of hard-bottom)					
Number of different species of stony corals					
Soft coral cover (percent of hard-bottom)					
Number of different species of soft corals					
Sponges (percent of bottom covered)					
Number of different kinds of sponges					
Fish and Wildlife					
Abundance of fish to eat					
Number of different species of fish to eat					
Abundance of fish to see (tropicals)					
Number of different species of fish to see					
Trophy/sport fish (lady fish, permit, bonefish, tarpon, snook, jacks)					
Number of species of macroinvertebrates					
Abundance of macroinvertebrates (conch, lobster, urchins)					
Opportunity to see large wildlife (sharks, rays, turtles, manatees, dolphins)					
Other					
Water clarity/visibility					
Number of other reef users					

WILLINGNESS TO PAY CARD

- **If <u>current management practices</u> continue in the future (<u>Status Quo</u>), in 10 to 20 years scientists expect that all but a few areas that are receiving special protection will be in a poor or <u>Low condition</u> with respect to the corals, sponges, fish, and water clarity/visibility. If rules and regulations are not enforced even the specially protected areas will be in poor or Low condition.**

- **If <u>management is changed</u> to improve reef conditions, it will require both public and private investments to protect and restore the coral reef ecosystems, which would include enforcement of rules and regulations.**

- **There is an estimated cost to your household per year that would be required to achieve each condition.**

- **The <u>cost per year</u> is based on the costs that will be paid by businesses and households to pay for investments that protect and restore the coral reef ecosystems like improved sewage treatment, filtering and cleaning urban run-off, erosion control from agricultural areas and development projects, installation of mooring buoys to protect reefs from anchor damage, reef restoration activities, and enforcement of rules and regulations.**

- **The <u>costs per year</u> would be paid by all residents and visitors to Puerto Rico through increased prices of goods and services. This might also include increases in local sales taxes to cover government costs to pay for protection and restoration.**

1. If all conditions could be maintained or increased from the Low to Medium condition.

   What would be the <u>maximum</u> your household would be willing to pay <u>per year</u> and still maintain your current level of reef use? $_____

2. If all conditions could be maintained or increased from the Low condition to the High condition,

How Coral Reef Attributes Levels Change Economic Values

Reef Attributes	Reef Conditions			Would Change Value (Check one in each row)	
Corals and Sponges	**Low**	**Medium**	**High**	**Low to Medium**	**Medium to High**
Stony coral cover (percent of hard-bottom)	None	5 to 20%	Over 20 to 100%		
Percent of live tissue of stony corals	None	60 to 90%	Over 90 to 100%		
Number of difference species of stony corals	None	Up to 4	5 to 17		
Soft coral cover (percent of hard bottom)	14 to 25%	4 to 14%	Less than 4%		
Number of different species of soft corals	Up to 4	Up to 3	1		
Sponges (percent of bottom covered)	7 to 15%	2 to 7%	Less than 2%		
Number of different kinds of sponges	Up to 4	Up to 3	1		
Fish and Wildlife	**Low**	**Medium**	**High**	**Low to Medium**	**Medium to High**
Abundance of fish to eat	3/sq meter, none legal size	10/sq meter, 50% legal size	100 or more/sq meter, 75 to 100% legal size		
Number of difference species of fish to eat	Up to 2	3 to 6	Up to 15		
Abundance of fish to see (tropicals)	1 to 3	4 to 10	20 to 100		
Number of different species of fish to see	1	Up to 4	5 to 10		
Trophy/sport fish (lady fish, permit, bonefish, tarpon, snook, jacks)	None	None	Opportunity to catch and see		
Number of different species of macroinvertebrates	None	1	2 or more		
Abundance of macroinvertebrates (conch, lobster, urchins)	None	Conch: 0, Lobster: 0, Urchin:1 to 2	Conch: 3, Lobster: 1, Urchin: 8 to 37		
Opportunity to see large wildlife (sharks, rays, turtles, manatees, dolphins)	None	None	Opportunity to see		
Other	**Low**	**Medium**	**High**	**Low to Medium**	**Medium to High**
Water clarity/visibility	Less than 10 ft.	10 to 50 ft.	Greater than 50 ft.		
Number of other reef users	21 or more	11 to 20	0 to 10		

DEMOGRAPHICS CARD

What is your age?

a. 18 – 24 d. 45 - 54
b. 25 – 34 e. 55 - 64
c. 35 – 44 f. 65 or older

What race do you consider yourself?

Select as [illegible]

a. White
b. Black or African American
c. American Indian or Alaskan Native
d. Asian
e. Native Hawaiian or Other Pacific Islander

What is the highest level of education that you have completed?

Select [illegible]

a. 8th grade or less
b. 9th to 11th grade
c. 12th grade. High School Graduate or equivalent (GED)
d. 13 to 15 years (some college or vocational training)
e. College Graduate
f. Graduate School, Law School, Medical School

What is your employment status?

Select a[illegible]

a. Unemployed e. Student
b. Employed full-time f. Homemaker
c. Employed Part-time g. None of the above (specify)
d. Retired ______________________________

What is your household income before taxes?

Select one answer only

a. Under $5,000 e. $20,000 to $24,999 i. $50,000 to $59,999 m. $150,000 +
b. $5,000 to $9,999 f. $25,000 to $29,999 j. $60,000 to $74,999
c. $10,000 to $14,999 g. $30,000 to $39,999 k. $75,000 to $99,999
d. $15,000 to $19,999 h. $40,000 to $49,999 L. $100,000 to $149,999