SUPPORTING STATEMENT

Limits of Acceptable Change Study surveys in the Northeast Reserves and Culebra Island, Puerto Rico

OMB CONTROL NO. 0648-xxxx

Christopher Jeffrey, PhD
Program Manager, CSS Inc.

A.   JUSTIFICATION

1. Explain the circumstances that make the collection of information necessary.

The Coral Reef Conservation Act (P.L. 106-562) calls for the development of sound scientific information on the condition of and threats to coral reef ecosystems (Section 202), and the Act calls on the Coral Reef Conservation Program (CRCP) to develop sound scientific information related to coral reef threats, address conflicts arising from coral reef ecosystem use, and to implement programs promoting the sustainable development and conservation of coral reef ecosystems (Section 204). Among the regions to be included under these objectives and the Act is the US Caribbean, including Puerto Rico.

The Northeast Marine Corridor (NMC), consisting of the marine components of the Corredor Ecológico del Noreste, Las Cabezas de San Juan, Arrecifes de la Cordillera, and Canal Luis Peña natural reserves, as well as the island and environs of Culebra, comprise an ecologically diverse and socioeconomically complex area (Hernandez-Delgado et al., 2014; Aguilar-Perera et al, 2006). The coastal areas within and abutting the corridor are among the most heavily populated and utilized zones in Puerto Rico, comprised of uses related to coastal development, commercial fishing, recreational fishing, water-related recreation, and navigation, among others (Shivlani, 2009). Specifically, the NMC hosts a variety of extractive and nonconsumptive activities, consisting primarily of commercial fishing, recreational angling and spearfishing, SCUBA diving, snorkeling, and boating. Activities in the NMC and especially along its eastern sector, including the Arrecifes de la Cordillera and Canal Luis Peña natural reserves and environs of Culebra, result in large visitor and user (daily and annual) loads that result in often highly congested situations.

While a few studies in the region have addressed topics relevant to the extent and intensity of uses and impacts, a majority have largely focused on individual reserves (Hernandez-Delgado et al., 2014) or uses (Agar and Matos-Caraballo, 2011; Shivlani and Koeneke, 2010) and have not characterized the entire corridor in a continuous manner. Also, continuous data collection – whether obtained via dedicated fishery dependent data collection, intercept recreational fishery efforts, concessionaire information, and vessel registration data – generally provide useful trend-level information but do not address issues related to (high-resolution) spatial use patterns, impacts, congestion, and levels of satisfaction. Thus, while the information available for the NMC does cover a number of stakeholder, the data relevant to understanding present and future uses and use patterns is fragmentary and inconsistent. That is, there is limited understanding of how use types, patterns, and trends interact with coastal and marine resources, the spatial

distribution of extractive and nonconsumptive uses, and the levels of satisfaction with present resource conditions and management effectiveness.

This data collection will use the Limits of Acceptable Change (LAC) framework to surmount these data gaps and to provide a comprehensive understanding on use and use patterns and congestion and satisfaction. Unlike other approaches that utilize numerical goals (ex. carrying capacity), LAC is used to direct management to achieve objectives related to the maintenance of desired resource and social conditions. As first framed by Stankey et al. (1985) and built upon by others (see Cole and Stankey, 1998, for a history and growth of the LAC framework), the conceptual core of LAC consists of the following steps: Agreement that there is conflict between two or more goals; establishment that all goals must be compromised; the designation of one goal as the ultimate constraining goal and another as the initial constraining goal; determination of LAC indicators and standards related to the ultimate constraining goal; acceptance of compromise within the ultimate constraining goal to an LAC; and management of the initial constraining goal so that the ultimate constraining goal is not compromised beyond the LAC (see also Cole and Stankey, 1998).

Within the NMC, where there are multiple uses, an LAC framework can establish an iterative process centered on the determination of use conflicts and compromises. Based on management decisions, resource protection can be designated as the ultimate constraining goal, whereas allowed activities can be designated as the initial constraining goal. Indicators and standards can be established that, via a monitoring program, track changes in resource conditions. If resource conditions decline via allowed activities up to the determined limit of acceptable change, then allowed activities could be constrained to prevent further degradation. Whereas the policy and management considerations related to the activities and resources fall outside the purview of this data collection, the process as it might be implemented in the NMC is described in more detail to highlight the tradeoffs that would need to be considered in weighing management options.

The NMC coastal and marine resources that are components of the larger coral reef ecosystem (Garcia-Sais et al., 2010) contain vulnerable benthic habitats essential to the sustainability of ecologically and economically important species. While it could be (rightly) argued that the ontogenetic nature of many such species and the preponderance of essential nursery, reproduction, and recruitment areas in the region necessitate full and complete protection, the NMC's tourism and fishery economies directly rely on access to these grounds and resources, often for intrusive and extractive activities. Thus, although there exist conflicting goals related to resource protection and tourism and fisheries (Step 1: Agreement that there are conflicting goals), there must be an acknowledgement that both resource protection and economic activities are important goals and should be accommodated to some extent (Step 2: Establishment that compromise is necessary across all goals).

Once this compromise has been reached, one or more conditions must be identified and established as the ultimate constraining goal(s) (Step 3: Decision on which goal may constrain the other goal(s), the initial constraining goal). Within the NMC, among the key resources are the area's coral reefs, important habitats in the Cordillera Natural Reserve (Reserva Natural Arrecifes de La Cordillera) and the Reserva Natural Canal Luis Pena), as well as other nearshore areas off the NMC. Goals such as coral cover, diversity, and abundance of reef-building corals could be used as a composite, ultimate constraining goal (Step 4: Development of indicators for and monitoring of ultimate constraining goal). Activities such as extractive fishing practices for

reef-dependent species (especially herbivores that may control algal growth, top predators that may prevent trophic cascades, and indicator species) and SCUBA, snorkeling, and vessel shading and anchoring over coral reefs may also be monitored to determine changes that may negatively affect reef health, which itself should be monitored via changes in the aforementioned indicators. Decisions also need to be made in terms of the level of degradation (change) that will be allowed to the ultimate constraining goal, such that whether coral cover, diversity, and/or abundances can be allowed to decline via fishing and tourism while the system remains functional or if a precautionary approach should be adopted (Step 5: Allow the ultimate constraining goal to be degraded by the initial constraining goal to an LAC). Once the composite measure for coral condition has been compromised to a threshold such as impaired function, species decline, or changes in community composition, fishing and tourism should be curtailed to prevent further deterioration (Step 6: Compromise the initial constraining goal to prevent further decline in the ultimate constraining goal).

This data collection can provide information in support of the use conditions that comprise the initial constraining goal, as related to levels and types of fishing and coastal and marine tourism activities, as well as social perceptions that may serve as secondary indicators on the actual or perceived resource conditions. The data collection can also determine how while not necessarily affecting resource conditions and functionality, existing use rates may impact the social desirability of tourism (ex., views on crowding). The information however cannot be used in decision making without due consideration of trade-offs. Benefits to establishing a low threshold for the ultimate constraining goal along the ecological dimension may result in a less impacted resource, increased functionality within the wider ecosystem, and greater resilience due to redundancy within and across habitats. However, the low threshold may negatively impact economic activity by limiting intensity and areas of use, lower catch limits, and more protected stocks. Conversely, establishing a higher threshold may reduce ecosystem function and render corals to greater stress conditions, while also affecting visitor satisfaction if crowding is perceived as a negative utility.

Thus, what this data collection can offer is the best available information necessary to make informed decisions to address resource protection in a heavily used and visited area. Without an understanding of the baseline conditions on the main uses of and activities in the NMC, decisions taken to address resource protection may either not correctly adjust or overwhelming restrict this initial constraining goal, leading to failures such as imperfect resource recovery, impaired ecosystem function, and poor compliance, among others.

2. Explain how, by whom, how frequently, and for what purpose the information will be used. If the information collected will be disseminated to the public or used to support information that will be disseminated to the public, then explain how the collection complies with all applicable Information Quality Guidelines.

The information will be collected using in-person surveys with the main stakeholders in the NMC (described in more detail in Section B); the main stakeholders identified for the region are commercial fishers, for-hire fishing and other water activities (dive, snorkel, kayak, etc.) operations, recreational vessel operators (including recreational fishers), and visitors (including recreational fishers). The complex of stakeholders is consistent with the types identified in previous studies in the region (Hernandez-Delgado et al., 2014; Shivlani, 2009) and are generally

consistent with stakeholder types in a mixed coastal economy (see Douevere and Pomeroy (2008) for a typology of coastal stakeholders).

The information will be collected by Dr. Manoj Shivlani of Marine & Coastal Research, Corp, a Consultant to CSS-Inc. under Contract # EA133C17BA0062/C0008 through a one-time data collection effort to create a baseline of uses and use conditions by stakeholder type.

There will be four survey instruments employed, or one for each stakeholder type, and each is described in detail. Data analyses to be conducted with the results from each survey effort are also described.

Please note that all surveys will be formatted to be administered digitally, in that all data will be stored locally and uploaded to a secure server, and a mapping program (Collector for ArcGIS - https://doc.arcgis.com/en/collector/) will be utilized to work in participatory mapping exercises (following Newing, 2010) with members from the four stakeholder groups.

Commercial fishers

A total of 90 commercial fishers operate in the NMC region (Leon, personal communication; Matos-Caraballo, personal communication), located in six main processing centers: Rio Grande; Luquillo; Fajardo (including Las Croabas, Martenillo, and Puerto Real); Ceiba (Playa de Los Machos); Vieques (Isabel Segunda; Esperanza); and Naguabo. Not all of the fishers in the westernmost and southernmost ports target fishing grounds within the NMS (Matos-Caraballo, personal communication), but a certain percentage does undertake longer trips on a seasonal basis for more high value species (namely queen conch, spiny lobster, and queen snapper).

Since Hurricane Maria, many ports and associated fishing infrastructure have been impacted. Villa pesqueras (fish houses or landing centers) in ports such Las Croabas and Naguabo have required extensive repairs, but as of March 2018, most were back in operation (personal observation; Leon, personal communication). This suggests that apart from those operators who have left the industry, fishing effort may return to full capacity by mid to late 2018 (Leon, personal communication).

Each fishing operation and processor in the villas pesqueras that target the NMC will be identified over the first phase of data collection. Fish processor managers will be contacted and requested to provide lists of active fishers who target the NMC, and each active fisher will be contacted to participate in the study over the study period. Recent work in the region with commercial fishers (Agar and Shivlani, 2017) has demonstrated that continuous visits to villa pesqueras are the best means by which to intercept fishers. Thus, visits will be made once a week per villa pesquera until all active fishers and processors have been contacted. Upon contact, fishers will be provided with information on the project and its objectives, and invited to participate in the survey. If a fisher is not immediately available, then the survey will be offered on a later time and date of greater convenience.

The top of the survey has space for the fisher's name, nickname (as most fishers in the fishery are known by their nicknames rather than their formal names), address, and contact phone number. This information is essential in the identification of fishers and contact details to verify data.

Question 1 asks the age of the fisher, which is important to determine the age demographics of the various age cohorts that target the NMC and to determine how effort may shift in the future.

Questions 2 and 3 ask for the primary port and primary villa pesquera, respectively, which assist in showing port-fishing ground linkages.

Question 4 asks how long the fisher has been fishing from the primary port and overall. The answers will determine the overall experience of the fisher and experience specific to the NMC.

Questions 5 to 8 concern the fisher's dependency on fishing as an occupation. Question 5 asks about how many members of the fisher's family depend on the fisher. Question 6 requests that the fisher identify the fisher's activity as full or part-time, and whether the fisher is a captain, crew member, or owner. Questions 7 and 8 ask the fisher to estimate the percentage of family income from fishing and fish landed that is consumed at home, respectively.

Question 9 asks whether the fishing operation employs other family members, as a means to learn whether the operation is multi-generational and shares costs within the household. Question 10 adds to the previous question by asking the fisher to identify whether crew members in the operation are paid in shares or daily rates (both systems occur in Puerto Rico (Agar and Shivlani, 2017)).

Questions 11-14 address targeted fisheries, fisheries investments, and maintenance costs, to evaluate the economic relationship between the fishing activity and areas used in the NMC. Question 11 concerns vessel characteristics, including number of vessels operated, vessel length, type of hull, vessel engines and motor power, vessel replacement value, engine replacement value, and electronic equipment and safety gear value. Question 12 addresses types and numbers of gears held and replacement value (market value). Question 13 asks for vessel, gear, and other maintenance and annual operating costs (such as dockage, licenses, insurance, etc.). Question 14 asks for the primary gear type.

Question 15 concerns species fished and fishing patterns, and fishing trip costs. This information is important to understand the species area linkages in the NMC and outside the NMC, to determine the absolute and relative importance of the NMC by species landings and costs. Table 1 requests information on different trip types taken by the operation in the previous year. The operation may have taken either single of multiple gear trips and/or a combination of both single and multiple gear trips over the previous year (Agar and Matos-Caraballo, 2010). The table allows the operation to list all combinations of trips, list the top three species landed in each combination, and identify area of use (by percentage) within the seven large areas in Puerto Rico. Past work in the region (Hernandez et al., 2014; Shivlani and Koeneke, 2010) has utilized participatory mapping (Newing, 2010) to excellent effect, and that approach will be followed in working with fishers to identify fishing areas, which will be followed up with a detailed mapping exercise for the NMC region in question 27.

Table 2 in Question 15 concerns trip costs, including fixed (crew, fuel) costs and variable costs (bait, supplies). The table asks questions on per trip fishing costs based on type and combination of gears used. This will facilitate an understanding on the costs associated with fishing in the NMC, especially as these relate to crowding and competing uses.

Table 3 in Question 15 concerns total species landings. The operation will provide landings for up to the top five species harvested in the previous year. The landings will show the relative importance of particular species to the operation (and the NMC industry), which can also be linked to a certain extent to the habitat types on which the species depends and is located.

Question 16 asks what factor most affects whether and where a trip is taken. The factors consist of weather, fuel price, species ex-vessel values, congestion/crowding, and preferred habitat. These factors are to be ranked from 1-5 to provide an understanding on the role that crowding plays, when compared to other more traditionally relevant factors.

Question 17 concerns crowding perceptions and acceptance levels. First, the fisher is asked about what the fisher believes is the threshold level of vessels around the fisher in a fishing area. Second, the fisher is asked what the fisher views around the fishing area on an average trip basis. The difference between the acceptable threshold and observed conditions will determine whether there is a perceived crowding conditions, or the so-called social norm inflection point (Bell et al., 2011).

Question 18 follows up on question 17 by asking what the effects of crowding are to the fisher's activities, in terms of whether higher rates of crowding are negatively correlated with overall fishery harvest, lower fishery catch rates, and/or higher rates of conflicts. The fisher is requested to rate the effects of crowding on each aspect that may occur as a result of crowding, on a scale from 1-5, where 1 is minimal effect and 5 is maximum effect.

Question 19 requests that the fisher identify the optimal number of vessels that can be at the fishing ground. This is different than the acceptable number of vessels, as the latter represents a compromise, whereas the former represents the most preferred condition.

Question 20 breaks down the user/vessel types into the following user types: Recreational fishers; commercial fishers; recreational divers (who may be spearfishing and lobster diving); commercial divers; commercial (tourist) catamarans; and private operators (who may be anchored/moored for non-fishing activities). The fisher is asked to rank the level of conflict that each vessel type presents to the fisher on an impact scale, from 1-5 (where 1 represents the least conflict, and 5 represents the most conflict).

Questions 21 and 22 ask the fisher to rank the conditions of various coastal and marine resources in the region, where question 21 concerns the present conditions and question 22 concerns the trends in the resources over the tenure of the fisher in the region. Based on how long the fisher has been in operation, this provides an understanding on how resource conditions have been perceived to have changed over that time period. The resources consist of fish (commercial), spiny lobster, queen conch, coral reefs, sea grasses, mangroves, other rocky habitats, and water quality.

Question 23 asks which resources have declined the most and why. A fisher can provide details on which resources have deteriorated more so than others and identify the drivers that have forced the decline.

Question 24 addresses potential solutions to improve or sustain resource conditions and

crowding. The fisher is asked whether the effort emanating from various user types should be changed (increase, decrease, remain the same). If the fisher believes that types should be changed, then the fisher is asked to provide an absolute change total (ex., 25%, 50%, 75% more or less). Also, the fisher is asked to identify a marine and coastal resource that would best serve as indicator of change that should trigger management action. Finally, the fisher is asked to rate different management options that can be deployed to reduce resource impacts and/or maintain resource conditions. These include no activity zones, no-take zones, zonation that separates different uses, education and awareness, and enforcement. The rating is based on a 1-5 scaled (where 1 represents the least preferred, and 5 represents the most preferred).

Question 25 asks the fisher to identify as many as three resources that the fisher believes could serve as important indicator resources and where changes in conditions could serve as a trigger for management action. Where possible, the fisher is asked to elaborate on why a particular indicator is selected and the types of changes in the indicator that should elicit a management action.

Question 26 asks for a preferences of different use management approaches in the fisher's fishing grounds, where the fisher can rate the following: limits to the number of vessels in the fishing grounds (via mooring buoys, area licenses), limited entry and fishery quotas, and zoned uses by area. These will provide important information on preferred options if management decisions on reducing crowding were required.

Question 27 asks for the fisher to use a map to identify areas of current and historical use by species, and areas of high congestion, use, and inter- and intra-group conflict. Similar maps have been created by Hernandez-Delgado et al. (2014) to develop an integrated model for coral reef management, and such information would be invaluable in identifying present and future areas of high use and conflict as the industry recovers from Hurricane Maria.

Data analysis for the commercial fishery will consist mainly of descriptive statistics determined for the thematic segments of the survey instrument and stratified across the NMC fishing centers. Questions 1-10 comprise the demographic and socioeconomic characteristics of the NMC commercial fishery, and results from these questions will be summarized as modes and percentages for category data questions and as average scores for data questions. As such, standard deviations will be calculated and included with the average response scores, and percentages (in quartiles, most likely) will be presented for categorical responses, respectively.

Findings from questions 11-14, which address the economic dimensions of the fishery, will be summarized as average scores, in terms of average totals of gear deployed, capital investments, and annual operating expenses. Standard deviations will be calculated and included with the average response scores.

The results from Table 1 for question 15 will be used to determine the importance of the NMC (area 3 in the survey map) relative to the overall fishing grounds among NMC commercial fishers, by trip and landings totals. The analysis will consist of determining average response scores for trips and landings, respectively, by area and by species. Results from Table 2 for question 15, which addresses variable trip costs, will be summarized as average response scores with corresponding standard deviations.

Questions 16-19 and question 26 will summarize interval data to determine the average response scores concerning trip decision-making, preferred and observed use conditions, effects of crowding on fishing conditions, and preferred management measures. Similarly, the interval data obtained from questions 20-23 concerning other stakeholder group impacts on use and resource conditions, respectively, will be summarized into average scores.

Answers for question 24, which concerns desired stakeholder use levels, will consist of both interval and ratio data, and these will be summarized as average response scores with corresponding standard deviations. The answers provided in question 25, which calls for the identification of suitable indicators, will be presented as modes and percentages (by binning open-ended responses into categories).

Spatial data collected from question 27 will be developed into spatial layers for individuals that will be joined to generate combined (total sample) layers for present use, historical use, areas of high use and congestion, and areas of conflict. Layers based on present and historical use by species, respectively, will also be joined to determine how changes in fishing patterns may have occurred over time. Further spatial analysis will determine area use densities, measured by the number of overlapping layers by area used (based on total response scores by area). While not presently determined, gridded cells may be used (ex., 1 nm X 1 nm cells) to measure changes in use by area.

Water-based operators

There are 103 operators that target the NMC (R. Colon-Rivera, personal communication; J. Medina, personal communication; personal observation), with effort emanating from coastal settlements as far west as Rio Grande to the south in Naguabo, as well as the island settlements of Vieques and Culebra. Most operators are located in the Luquillo-Fajardo-Naguabo corridor and off the aforementioned islands, but there are others that take dedicated trips to the NMC from farther ports. Of the total, almost two thirds (65%) offer some combination of snorkel trips (cruising, kayaking, and/or beach visits), 26% specialize in fishing trips (although several also offer combination fishing and in-water activity trips), 24% take SCUBA trips, 23% offer kayak trips, 16% are sailboat operations, and 8% specialize in trips to one of the bioluminescent bays (off Fajardo and Vieques). Over 90% of the operators offer more than one type of trip, likely to maximize clientele and income.

Each water-based operation that targets the NMC will be approached over the first phase of data collection to identify all active operations; this will be accomplished by working with DNER personnel, such as the La Cordillera Reserve and Natural Area management staff, other trusted operators, and marinas. Then, each active operation will be contacted in person to participate in the study over the study period. Visits will be made once a week per port until all active operators have been contacted. Upon contact, operators will be provided with information on the project and its objectives, and invited to participate in the survey. If an operator is not immediately available, then the survey will be offered on a later time and date of greater convenience.

The top of the survey has space for the name of the operation, name and position of the person in the operation interviewed (the survey will be open only to those personnel with direct knowledge of daily operations, visitor loads, and areas visited), address, and contact phone number. This

information is essential in the identification of operations and contact details to verify data.

Questions 1-6 address basic and demographic information. Question 1 asks for the principal port, and question 2 follows up by asking whether the operation utilizes a secondary port. If a secondary port is identified, then the question asks the name of the port, number of times the port is used annually, and areas visited via the secondary port. Question 3 asks for the length of time that the operation has been in existence. Question 4 concerns how long the respondent has been with the operation, and question 5 follows up by asking how long the respondent has been working in the profession and within the NMC. Question 6 asks the age of the person interviewed. These questions all provide a profile on the operation and its tenure, as well as that of the respondent, to determine whether there are any differences in views on resource conditions, crowding, and conflicts based on the amount of time that the operation and operator have been in existence and working, respectively, in the region. This information can be utilized to ascertain whether there is a shifted baseline based on tenure, similar to that which has been encountered in other marine-based industries (ex., Pauly, 1995).

Questions 7-17 concern the operation's trip profiles; these questions estimate economic investments and operating expenses (i.e., economic dependency), identify the use areas, and quantify visitor loads by activity.

Question 7 addresses the basic information on the vessels used in the operation, ranging from motorized vessels, sailboats, personal watercraft (PWC), stand-up paddleboards (SUP), and sea kayaks. Characteristics asked about each vessel type include vessel length, number of total passengers, number of divers and snorkelers, total crew, and present-day vessel value.

Question 8 requests estimates on annual operation costs, consisting of marina and/or boat slip fees, operation insurance, dive and snorkel gear value and approximate duration of gear, and fishing gear value and approximate duration of gear.

Question 9 concerns trip information, as broken down by vessel type. This consists of whether the vessel operates year-round, the number of trips taken by vessel per day, and the average number of passengers, divers, and snorkelers taken by vessel per trip.

Question 10 requests percentages of clients/trips taken by activity type, consisting of snorkeling, diving, spearfishing, hook and line fishing, cruising, kayaking (including SUP), jetski rental, and water taxi. This allows a better understanding on the relative use profiles and dependencies by activity. All subsequent vessel-based questions (Questions 12, 14, 15) are asked for each vessel type, as several operations use more than one type of vessel (for different activities). Operators are asked to identify the vessel types that they use in terms of the top three vessels used; vessel types include powerboats (bay boats, flats boats, and offshore powerboats), yachts, catamarans, and 'other'.

Question 11 asks whether the operation offers a resource or site lecture/briefing to clients before each trip; if the answer is that there is such a lecture, then the follow-up question is on the type of information provided over the lecture. The information provided elucidates the types of pre-trip advice and education that is used to prevent resource damage and avoid use conflicts, thereby improving resource and capacity conditions (Medio et al., 1997).

Question 12 asks the operator identify areas of operation around Puerto Rico (there are seven areas identified, including area 3, which is the NMC and the Culebra region). The operator is to provide the areas used by vessel type and by region to gain a better understanding on whether activities are separated in and around the NMC.

Using a map that shows the NMC and surrounding areas, question 13 requests the identification of use routes/patterns, where more than one site is visited. Several operators in the Fajardo/Ceiba area take multi-island and multiple use (beach visitation, snorkeling, and cruising) trips (Hernandez-Delgado et al., 2014). The question also asks for the identification of areas by type of use, high use or congested areas, and alternative use areas, by season or other (ex., crowding) factors. The question also asks to identify historical use areas, to determine whether changes in use have occurred (and why).5

Question 14 concerns crowding perceptions and acceptance levels. First, the operator is asked about what the operator believes is the threshold level of vessels and visitors around the operator's use area. Second, the operator is asked what the operator observes, based on the number of vessels and visitors, around the use area on an average trip basis. The difference between the acceptable threshold and observed conditions will determine whether there is a perceived crowding conditions, or the so-called social norm inflection point (Bell et al., 2011). Third, the operator is asked to estimate the change in the number of vessels operating in the area since when the operation first commenced, to determine a historical baseline. Finally, the operator is asked to provide a vessel total that the operator believes would be optimal for the area visited.

Question 15 asks the operator to rate the factors that influence the operator's decision to visit a particular site. The factors are rated on a 1-5 scale, where 1 is the least important and 5 is the most important. The factors to be considered are the weather, time taken to reach the site, congestion at the site, number of passengers/clients, activities to be undertaken, sonic/music pollution or related aesthetics, and site status (in terms of resource conditions). While factors such as fuel costs (trip time) and activity type tend to dominate site selection (Shivlani et al., 2008; Shivlani and Suman, 2000), noise and other aesthetics are of considerable concern in the region (A. Ramos, personal communication; R. Colon-Rivera, personal communication).

Question 16 addresses the changes in types of uses in the area. This will allow for a better understanding on how congestion, crowding, and use conflicts may have changed over time, especially in relation with resource availability and conditions. The use types to be considered in the question are recreational fishers, commercial fishers, recreational divers, commercial divers, large vessel operators, charter boat operators, and private vessel operators. The rating in terms of changes in use is from 1-5 where 1 is much less than in the past, 3 is the same as in the past, and 5 in much greater than in the past.

Question 17 asks the operator to rate the magnitude of impacts that other vessel or use types have on the operator's activities, where 1 is the least impact and 5 is the most impact. The types of vessels and users consist of recreational fishers, commercial fishers, recreational divers, commercial divers, large vessel operators, charter boat operators, and private vessel operators.

Questions 18 to 28 concern operator perceptions on resources and resource conditions and preferences for management options. These questions address an important aspect of determining

capacity and use limits, as these relate to perceptions concerning how resources are faring under present management and use conditions and how alternate scenarios may address any overuse and overcapacity issues.

Question 18 asks the operator to rate the condition of various coastal and marine resources, as these relate to the productivity, integrity, and attractiveness of the region. The resources are rated across a 5-point scale, where 1 is bad and 5 is excellent. The resources to be ranked are reef fish, spiny lobster, queen conch, coral reefs, sea grasses, mangroves, other rocky habitats (hard bottom), and water quality.

Following up on the previous question, the operator in question 19 is asked to identify how the various resource conditions have changed since when the operator first started taking trips in the region. The 5-point scale is set up such that 1 is much better than in the past and 5 is much worse than in the past. All conditions to be considered are the same as in question 18.

Question 20 asks the operator to identify the impacts that different users/use types have on coastal and marine resources. Based on a 5-point scale, where 1 is no impact and 5 is highest impact, the different user groups to be rated are other operators, recreational fishers, commercial fishers, recreational divers, commercial divers, and private vessel operators.

Question 21 asks the operator to identify the resource that has most deteriorated (in terms of condition and why. The open-ended nature to this question is important, as it will allow the respondent to provide a nuanced and richer description on the changes that have occurred and the causal factors involved. Similar, semi-structured questions have been used with the region's stakeholders in a recent study (Agar et al., forthcoming) and have provided excellent insights on resource conditions.

Question 22 addresses potential solutions to improve or sustain resource conditions and crowding. The operator is asked whether the effort emanating from various user/vessel types should be changed (increase, decrease, remain the same). If the operator believes that types should be changed, then the operator is asked to provide an absolute change total (ex., 25%, 50%, 75% more or less).

Question 23 asks the operator to identify as many as three resources that the operator believes could serve as important indicator resources and where changes in conditions could serve as a trigger for management action. Where possible, the operator is asked to elaborate on why a particular indicator is selected and the types of changes in the indicator that should elicit a management action.

Question 24 asks the operator to rate different management options that can be deployed to reduce resource impacts and/or maintain resource conditions. These include no activity zones, no-take zones, zonation that separates different uses, education and awareness, enforcement, daily limits on total vessel use, mandatory mooring buoy use, and limited entry. The rating is based on a 1-5 scaled (where 1 represents the least preferred, and 5 represents the most preferred).

Question 25 follows up on question 13, asking the operator to identify areas that should be zoned on a map of the NMC, including no-entry, no-extraction, and use separation zones, as preferred

by the operator.

Question 26 asks if the operator is in favor of limits of users in the areas that the operator uses, and if so, then the numbers of vessels/operators that should be allowed in those areas at the same time. The follow-up question is how to control limits of use, in terms of preferences over limits on the number of visitors by area per day, limits on the number of vessels by area per day, or exclusive areas for different types of uses.

Question 27 asks for a ranked preference of the following use management approaches in the areas used by the operator: limits to the number of vessels in the use areas (via daily limits, mooring buoys, area licenses), limited entry, and area rotation. These will provide important information on preferred options if management decisions on reducing crowding were required.

Data analysis for the commercial operator industry will consist mainly of descriptive statistics determined for the thematic segments of the survey instrument and stratified across the NMC ports and types of water-based operation/activity. Questions 1-6 comprise the demographic and socioeconomic characteristics of the NMC operator industry, and results from these questions will be summarized as modes and percentages for categorical data questions and as average scores for ratio data questions. As such, standard deviations will be calculated and included with the average response scores, and percentages (in quartiles, most likely) will be presented for categorical responses, respectively.

Findings from questions 7-10, which address the economic and trip characteristics of the fishery, will be summarized as average scores, in terms of average totals of vessels and gear owned, visitors by trip type, capital investments and annual operating expenses, trip totals and visitors per trip, and percentages of types of trips taken. Standard deviations will be calculated and included with the average response scores. Question 11, which concerns information provided over a trip, will be summarized by mode and percentage, with the open-ended answers being binned into categorical data.

The results from question 12 will be used to determine the importance of the NMC (area 3 in the survey map) relative to the overall use areas among NMC commercial operators, by trip totals. The analysis will consist of determining average response scores for (percentage of) trips by area.

Spatial collected from questions 13 and 25 will be developed into spatial layers for individual operations that will be joined to generate combined (total sample) layers for port to use area routes, areas of use by activity offered, alternate use areas, area of high use and congestion, and historical use areas. Layers based on activities, respectively, will also be joined to determine how similar uses may be overlap (or not). Also, no use, no take and zoned areas will be created into layers that will be joined to determine which areas are preferred as restricted zones. Further spatial analysis will determine area use densities and preferred restricted areas, measured by the number of overlapping layers by area used (based on total response scores by area). While not presently determined, gridded cells may be used (ex., 1 nm X 1 nm cells) to measure changes in use and preferences for restrictions by area.

Question 14 findings will be summarized as average response scores for the vessel and use conditions tolerated and preferred and changes observed over time by respondents. Results from

questions 15-20 and question 24 will summarize the interval data to determine the average score of answers provided concerning changes in crowding, effects of crowding, and preferred management measures.

Answers for question 22, which concerns desired stakeholder use levels, will consist of both interval and ratio data, and these will be summarized as average response scores with corresponding standard deviations, respectively. The answers provided in question 23, which calls for the identification of suitable indicators, will be presented as modes and percentages (by binning open-ended responses into categories).

Recreational vessel operators

In 2017, there were an estimated 70,000 vessel licenses in Puerto Rico, of which 26,000 licenses are considered active (Puerto Rico Department of Navigation, personal communication; Ramos, personal communication). Coastal and marine use tends to co-vary with large population and recreational centers (Shivlani, 2009), and one of the most actively used areas is the NMC, especially off Fajardo and Ceiba.

The most active public boat ramp in the NMC is located in Las Croabas, in Fajardo. The ramp location provides equal access to the western side, including areas off Luquillo through Rio Grande, and the eastern and southern sides, including the highly visited Cordillera and Culebra Reserve and Natural Areas. Other, minor marinas in Luquillo and Naguabo, which historically have had lower vessel traffic (R. Colon-Rivera, personal communication; Medina, personal communication) have been badly damaged by Hurricane Maria in September 2017.

The methodology adopted for surveying the NMC vessel operator population will be by implementing an intercept survey for vessel operators returning from a trip. It will consist of intercepting each returning vessel operator, from 10 am to 4 pm, over two week days and two weekend days each month for a total of 12 months, for a total of 48 sessions. The methodology has been tested in other regions (Shivlani, 2006) and has provided excellent response (95%) rates. Vessel traffic is higher over weekend days and in summer months (Shivlani, 2009), as a result of more leisure time and better boating conditions, respectively; therefore, a year-long study will yield information that can elucidate seasonal patterns and changes in visitor types.

Each vessel operator intercepted will be provided information on the study and be requested to participate in the study. The interviewer will make certain that the respondent understands the intent of the study and will assure that the respondent that all information will remain confidential. The survey will be administered using a 4G enabled tablet such that all information can be expeditiously collected and promptly archived.

Questions 1 through 7 address the vessel and vessel operator's demographic characteristics, including the operator's zip code (question 1), principal and secondary port (question 2), age group (question 3), years operating a vessel in Puerto Rico (question 4), type of vessel (question 5), vessel length (question 6), and vessel engine horsepower (question 7). These questions are important to be able to classify areas of effort, tenure, and vessel power, all of which affect areas visited, the ability to switch areas, and type of trips taken.

Questions 8 through 11 concern trip characteristics, such as the number of trips taken per week days and weekend days per month (question 8), average number of hours per trip (question 9), number of persons taken per trip (question 10), and the area visited most frequently (question 11). In terms of areas of use, a map is provided which divides the coastal and marine areas off Puerto Rico into seven areas, and area 2 denotes the NMC and environs. The follow-up to question 11 are questions 18 and 19, which provide more detailed maps in which the operator is requested to identify areas of use by six main activities: cruising; snorkeling; diving; visiting beaches, fishing; and spearfishing.

Questions 12 to 17 address use patterns and conditions, especially as these relate to resource health and capacity conditions. These will help in determining vessel operators' uses of the NMC, their views on other stakeholders in the region, and their perceptions concerning resource health.

Question 12 asks the operator about crowding conditions over a typical trip, where the conditions may be very crowded, somewhat crowded, normal, not so crowded, or not crowded at all. The operator is also provided with a scenario for each conditions, such that it ranges from having no space for activities to having as much space as needed for activities.

Question 13 concerns the use frequency of activities per trip, where the operator responds that the activity is conducted on all trips, most trips, half the trips, occasionally, or never. The activities consist of hook and line fishing, spearfishing, diving, snorkeling, swimming, water skiing, cruising, visiting beaches, or another activity not listed.

Question 14 asks the operator to estimate the number of other vessels seen on a typical trip while undertaking the activities itemized in question 13, where the vessels seen are segmented into 1-5 vessels, 6-10 vessels, 11-15 vessels, 16-20 vessels, 21-25 vessels, 26-30 vessels, and over 30 vessels. This question provides information on crowding by type of activity by areas visited.

Question 15 asks the operator on the maximum number of other vessels or users (ex., divers, snorkelers, fishers, etc.) that the operator tolerates before leaving to another site, based on the activities listed in question 14. This is because there may be different thresholds for different activities, and thus more users or vessels may be tolerated for certain activities over others.

Question 16 asks the operator to rate various coastal and marine resources in the areas where the operator takes a majority of trips. These resources are comprised of water clarity, marine life diversity, fish and other marine life size, fish and other marine life abundance, coral abundance, coral health, and beach quality.

Question 17 asks the operator to rate the impact that different use types have on the quality of a typical trip. The rating is from high impact to no impact at all, and the use types consist of the number of other recreational vessels, the number of other persons, behavior of other vessels, music or sounds from other vessels, waste/garbage emanating from other vessels.

Data analysis for the recreational vessel operator stakeholder group will consist mainly of descriptive statistics determined for the thematic segments of the survey instrument and stratified across the primary port identified in question 2. Questions 1-10 comprise the demographic, vessel, and use characteristics of the stakeholder group, and results from these questions will be

summarized as modes and percentages for category data questions and as average scores for ratio data questions. As such, standard deviations will be calculated and included with the average response scores, and percentages (in quartiles, most likely) will be presented for categorical responses, respectively.

The results from question 11 will be used to determine the importance of the NMC (area 3 in the survey map) relative to the overall use areas among the respondents, by trip totals. The analysis will consist of determining average response scores for (percentage of) trips by area. Spatial data collected from questions 18 and 19 will be developed into spatial layers for individuals that will be joined to generate combined (total sample) layers for port and use areas, including areas of use by activity type. Further spatial analysis will determine area use densities, measured by the number of overlapping layers by area used (based on total response scores by area) and by activity. While not presently determined, gridded cells may be used (ex., 1 nm X 1 nm cells) to measure changes in use by area.

Answers for questions 12-17, concerning stakeholder views on use and resource conditions and preferred management options and the maximum numbers of vessels and users tolerated, will be summarized as average response scores with corresponding standard deviations.

Visitors

An estimated 1.16 million visited the northeast and the islands of Culebra and Vieques in 2016-2017 (V. R. Leeworthy, personal communication), and reef use in the northeast was especially high, with over 85% of the visitors participating in one or more reef-based activity. These totals represent the most recent estimates of visitation to the island and, in particular, reef-based use.

There are five key locations to conduct intercept surveys of visitors in the region that provide access to a variety of different visitor types: Culebra Ferry Dock; Vieques Ferry Dock; Medio Mundo Beach in Ceiba; Seven Seas Beach in Fajardo; and Monserrate Beach in Luquillo. The combination of the ferry docks and beaches maximize the ability to intercept visitors who have participated in water-based activities in the region, ranging from beach visitation, snorkeling, diving, vessel-related uses (kayak, SUP, jetski, etc.), and fishing.

The methodology adopted for surveying the NMC visitor population will be to implement an intercept survey for visitors at the five sites. At the ferry docks in Culebra and Vieques, visitors will be intercepted when returning to the main island from the smaller islands starting at two hours before the scheduled ferry departure time (a similar approach was utilized by Shivlani and Bruckner (2007) in Vieques, yielding a 95% response rate). Beach visitors will be intercepted at their respective beach locations over two-hour survey sessions in Ceiba, Fajardo, and Luquillo (Shivlani et al., 2003 reported a 90% response rate with beach visitors in southeast Florida, and other studies have been conducted with visitors with similar high rates along recreational coastal areas (Peng and Oleson, 2017; Schuhmann, 2012). Each site will be sampled over two week days and two weekend days each month for a total of 12 months, for a total of 48 sessions at each site. Visitation is expected to be higher over weekend days, and visitor types will likely shift from summer to winter months; therefore, a year-long study will yield information that can elucidate seasonal patterns and changes in visitor types.

Each visitor intercepted will be provided information on the study and be requested to participate in the study. The interviewer will make certain that the respondent understands the intent of the study and will assure that the respondent that all information will remain confidential. The survey will be administered using a 4G enabled tablet such that all information can be expeditiously collected and promptly archived.

The date and site location of the interview are recorded in the survey. This provides a means by which to compare results from the different sites, as visitor types may vary.

Question 1 asks for the zip code or country of the visitor, as a means by which to determine (a) whether the visitor is from the island, US mainland, or another country and (b) utilize domicile information for other demographics.

Question 2 asks the visitor's gender, and question 3 asks for the visitor's age group.

Question 4 asks about the number of persons in the visitor's party/group, question 5 asks if the trip is a day trip (more so for local visitors) or overnight (more so for air-based visitors). Question 5 also asks for the length of the visit. Question 6 asks if this is the visitor's first trip to Puerto Rico, and if so, then in what year was the previous trip. Question 6 allows for a more nuanced understanding on whether returning visitors have different views on resources and capacity conditions than do those who are making their first trip.

Question 7 asks about which locations have been visited, of which all identified locations are in or within the environs of the NMC.

Questions 8 and 9 ask for the types of activities in which the visitor participated and the activity that comprised the main reason for the visit, respectively. These activities include shore-based activities (relaxation, hiking, culture, beaches), water-based activities taken from the shore (snorkeling, diving, surfing, fishing), and water-based activities taken from a vessel (snorkeling, diving, fishing, kayaking).

Question 10 asks for the number of visitors that the visitor would consider reasonable (ex., accepted norm) in the visitor's activity area for beach visitation, snorkeling, diving, kayaking, surfing, hiking, fishing, spearfishing, and visiting the bioluminescent bay. The visitor ranges provided are 1-5, 6-10, 11-15, 16-20, 21-25, 26-30, and over 30. While larger snorkeling, kayaking, and multiple use operators take out much more than 30 visitors (Delgado-Hernandez et al., 2014; Medina, personal communication), the question here pertains to the space in the immediate area around the visitor.

Questions 11 and 12 pertain to the beaches visited. Question 11 asks the visitor to identify the top three beaches visited (in terms of total use), and question 12 follows up by asking for the conditions of various aspects of each beach. The aspects of the beach include the number of visitor seen at the beach, and the quality of each of the following on a 1-5 rating scale, where 1 is excellent and 5 is very poor: Amenities; cleanliness; space; crowding; and natural resource conditions. Also, the visitor is asked whether visitor totals should be lowered at the site.

Questions 13 and 14 address visitors' views on snorkeling. In question 13, visitors are requested to classify their snorkeling expertise into one of three categories (beginner, intermediate,

advanced). This is to ascertain whether there is a relationship between expertise and resource views, either in terms of specialization theory (Anderson and Loomis, 2011; Harangody, 2017) or knowledge on the condition of resources. Question 14 asks the visitor about the conditions on the three main snorkeling areas in the NMC (shore-based snorkeling, Luis Pena Canal No-take Marine Reserve off western Culebra, and La Cordillera Reserve and Natural Area). The questions concern the number of other snorkelers seen in the area, and, and the quality of each of the following on a 1-5 rating scale, where 1 is excellent and 5 is very poor: water clarity; number of fish; types of fish; size of fish; coral condition; and crowding. Also, the visitor is asked whether visitor totals should be lowered at the site.

Questions 15 and 16 address visitors' views on diving. In question 15, visitors are requested to classify their diving expertise into one of three categories (beginner, intermediate, advanced). Question 16 asks the visitor about the conditions on the three main diving areas in the NMC (shore-based diving, Luis Pena Canal No-take Marine Reserve off western Culebra, and La Cordillera Reserve and Natural Area). The questions concern the number of other divers seen in the area, and, and the quality of each of the following on a 1-5 rating scale, where 1 is excellent and 5 is very poor: water clarity; number of fish; types of fish; size of fish; coral condition; and crowding. Also, the visitor is asked whether visitor totals should be lowered at the site.

Questions 17 and 18 address visitors' views on recreational fishing. In question 17, visitors are requested to classify their fishing expertise into one of three categories (beginner, intermediate, advanced). Question 18 asks the visitor about the conditions fishing from shore, fishing from a vessel, and spearfishing in the NMC. The questions concern the number of other fishers seen in the area, and, and the quality of each of the following on a 1-5 rating scale, where 1 is excellent and 5 is very poor: number of fish caught; size of fish caught; target species caught; and crowding. Also, the visitor is asked whether visitor totals should be lowered at the sites fished.

Question 19 asks for a rating of coastal and marine resources and pollution on areas visited, where the ratings range from 'excellent condition' to 'very poor condition', on a 5-point scale. The resources to be rated are: beaches, mangroves, sea grasses, water clarity, plastics on the coastal and water, other trash, coral reefs, fish and invertebrates, and overall resource conditions.

Question 20 asks the visitor to rate the number of visitors that were seen over the trip on a 5-point scale, where the visitor can select between 'much more than expected' to 'much less than expected'.

Questions 21-23 concern trip satisfaction and willingness to return for a trip in the next five years. Based on a 5-point scale in question 21, the visitor is asked how likely the visitor is to return to the area within the next five years. Question 22 follows up by asking which factors affect the expected likeliness to return. The factors, which are rated on a five point scaled from 'very important' to 'not important at all', are: beach quality, condition of coastal and marine resources; amount of coastal pollution, crowding conditions, amount of noise pollution, especially from music, and the cost of the trip. Finally, question 23 asks which of the aforementioned factors are the single most important that influence the visitor's willingness to return.

Data analysis for the visitor stakeholder group will consist mainly of descriptive statistics determined for the thematic segments of the survey instrument and stratified across the intercept

location. Further strata that may be described include US mainland, Puerto Rico, and foreign visitors. Questions 1-7 comprise the demographic and use characteristics of the stakeholder group, and results from these questions will be summarized as modes and percentages for category data questions and as average scores for ratio data questions. As such, standard deviations will be calculated and included with the average response scores, and percentages (in quartiles, most likely) will be presented for categorical responses, respectively.

The results from questions 8-9 will be used to determine the importance of Puerto Rico as a visitor destination, as determined by the modes and percentages of activities undertaken and the top activity for the visit. Views on activity and activity site expected conditions obtained from question 10 will be summarized with average response scores.

Answers from questions 13-18, related to resource quality and crowding, will be summarized as average response scores, except for the questions concerning views on reducing visitor totals, which will be presented as modes and percentages.

Answers for questions 19-23, concerning stakeholder views on use and resource conditions and preferred management options and willingness to return on a trip, will be summarized as average response scores.

NOAA CRCP will retain control over the information and safeguard it from improper access, modification, and destruction, consistent with NOAA standards for confidentiality, privacy, and electronic information. See response to Question 10 of this Supporting Statement for more information on confidentiality and privacy. The information collection is designed to yield data that meet all applicable information quality guidelines. Although the information collected is not expected to be disseminated directly to the public, results may be used in scientific, management, technical or general informational publications. Should NOAA CRCP decide to disseminate the information, it will be subject to the quality control measures and pre-dissemination review pursuant to Section 515 of Public Law 106-554.

3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological techniques or other forms of information technology.

All stakeholder groups will be targeted via in-person surveys using tablets connected to the Internet using tested survey software that can assure real-time data uploads. This electronic approach to be used in this survey will be applied to reduce burden hours by utilizing skip logic procedures to minimize extraneous questions, and the surveys administered will be provided in Spanish and English to make it fully accessible.

4. Describe efforts to identify duplication.

Preliminary work in support of the project and the development of other work products (not related to survey data collection) has involved considerable input with local, state, and federal agencies, interest groups, and stakeholders to identify means by which to avoid all duplication.

A kickoff meeting was held in December 2016 with Puerto Rico Department of Environmental Resources (DNER) personnel, reserve manager, and support personnel to describe the project, approach, and expected results. Meetings were also held with NOAA and DNER personnel in March 2017 and with stakeholder groups in May and September 2017 to discuss means by which to identify duplication, minimize repeating any ongoing or recently completed efforts, and to ensure that the project will lead new and useful information.

Follow-up meetings were held in March 2017 with DNER personnel and area stakeholder representatives to estimate the impacts of Hurricane Maria on uses of and access to the study area. These meetings served as a second kickoff approach to ensure that all stakeholders identified in the initial part of the study could still be approached and indeed, in terms of the commercial operators, were still in operation.

Based on these formal sessions and other meetings with stakeholders, agency personnel, researchers, and interest group representatives, it is clear that there are no ongoing or recently concluded data collection efforts that duplicate this effort.

5. If the collection of information involves small businesses or other small entities, describe the methods used to minimize burden.

The small businesses involved would be commercial fishers and for-hire operations. The burden would be minimized by conducted brief, in-person surveys. The burden to these entities will be minimized using established survey techniques and protocols (Alreck and Settle, 2004) that maximize data collection. The protocols to be adopted have been successfully used in the past in the region (Agar et al., submitted; Agar et al., 2008) and will involve contacting entities in a systematic manner that seeks to schedule convenient times and locations of the entities' choosing. Surveys will also be provided in English and Spanish to reduce any time required for on the ground translation; the project will involve using as much existing data (ex., DNER reserve concessionaire information, DNER and NOAA Fisheries commercial fishery data) to eliminate the need to collect information that is otherwise available, thereby minimizing the burden to the entities.

6. Describe the consequences to the Federal program or policy activities if the collection is not conducted or is conducted less frequently.

The data collected will assist decision makers in guiding management to best protect vulnerable species across the coastal and marine environments of the NMC. These include species under territorial and federal protection, including but not limited to the West Indian manatee, various species of sea turtle, and acroporid corals, among others. The information collected would determine the suite, frequency, and intensity of interactions among stakeholders and these and other resources, and how such interactions may affect the ecological viability of and economic benefits accrued by the region.

Also, without the information is available less frequently, policy activities would face data gaps leading to uncertainty in decision making, less confidence in anticipated impacts, and poor

understanding of long-term trends in use and resource interactions. These gaps would greatly affect any meaningful evaluation on the efficacy of management approaches and related benefits.

7. Explain any special circumstances that require the collection to be conducted in a manner inconsistent with OMB guidelines.

There are no circumstances that require data collection to be conducted in a manner inconsistent with OMB guidelines.

8. Provide information on the PRA Federal Register Notice that solicited public comments on the information collection prior to this submission. Summarize the public comments received in response to that notice and describe the actions taken by the agency in response to those comments. Describe the efforts to consult with persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported.

A Federal Register Notice published on June 15, 2017 (82 FR 115 (27693-27694)) solicited public comments. Three public comments were received. Responses to each comment are provided below.

Comment 1
A comment received on June 16, 2017 was related to the project's apparent omission of recreational anglers from the list of stakeholders to be surveyed. The commenter stated that the recreational angler community outnumbers other participants in other fishery sectors, and that anglers should be included as their own category in the survey effort. It was also suggested that recreational representatives should be screened by asking whether the respondent has ever held a commercial fishery license in Puerto Rico.

The comment is fair in that it identifies a key stakeholder group, that of recreational anglers, in Puerto Rico. Recreational anglers are also likely a major stakeholder group in the region, given the number of recreational fishing vessels that operate in the NMC (especially in the ports of Fajardo and Ceiba). Vessel-based angling will in fact be captured in the project, as recreational vessel operators will be surveyed on whether they fish, fishing intensity, and areas fished. However, the group is not split into boaters and fishers, and the latter will comprise a percentage of the former. Thus, vessel-based, recreational angling (and spearfishing) will be accounted for in the project.

By contrast, early fieldwork in the project used to determine the suite of stakeholders in the region did not identify significant shoreline fishing in the NMC. While shoreline anglers were identified on rare occasions, such occurrences were (a) not concentrated in discernible intercept sites/locations, and (b) inconsistently utilized. Additional communication with research personnel who have conducted recent fishery data collection efforts in the region (M. Valle-Esquivel, personal communication) or are otherwise familiar with the area (R. Colon-Rivera, personal communication) confirmed that there is little shoreline angling. More recent work by V. R. Leeworthy (personal communication) determined that only 2.9% (n = 448 fishing days) of all

fishing days in the NMC area and environs were conducted from the shoreline.

Nevertheless, intercept surveys conducted along the most important beaches and ferry docks with visitors will be used to capture the sparse shoreline effort. The survey instrument includes questions on shoreline fishing, and these will be utilized to determine fishing patterns along key access points in the NMC. Thus, shoreline fishing will be captured as part of the study effort.

Comment 2
A comment received on June 17, 2017 stated several concerns. The first of these was whether the targeted "audiences" in the study are useful to the information sought. The commenter argued that end-users rather than fundamental stakeholders were targeted for the study, and that the study would benefit from addressing the feasibility of delineating explicit responsibilities across a variety of federal and territorial agencies. The point is fair, in that there is a need for cross-sectoral and inter-agency collaboration (see Bown et al., 2014 for a volume-length review), but the focus of the present study is to develop a social conditions baseline predicated on an LAC framework by determining existing uses and use patterns, knowledge, attitudes, and perceptions, and use conflicts. While information in support of the data collection and project, including past and future discussions with agencies, research community personnel, and other experts, will support what the commenter suggests is otherwise missing from the effort, it is important to reiterate that the focus of the study is not an inter-agency policy or management effectiveness analysis; it is a primary stakeholder (see Pomeroy and Douvere, 2008 for a stakeholder typology), use study in support of an LAC framework. The information gleaned from the study will greatly enhance the performance of the functions of the agency (and other collaborating agencies), but it is not the role of the project to enhance that existing collaboration, as that is outside the purview of the project.

The comments concerning ways to enhance information quality, utility, and clarity state that the project should account for the "historical and anectode (sic) biophysical changes to date", consider authoritative stakeholders in the stakeholder groups to be sampled, evaluate the responsibilities and capacity of authoritative stakeholders, and address how end-user stakeholders can facilitate the implementation of authoritative stakeholder responsibilities. The project does address existing biophysical and social conditions, and both sets of conditions will comprise their respective characterization reports (i.e., building on past work, as stated in the notice). However, the project does not intend to define or include authoritative stakeholders (often considered as secondary stakeholders), as the LAC framework, as adopted for this project, does not accommodate such stakeholders in the development of primary constraining or ultimate constraining indicators. DNER personnel, NOAA officials, and reserve management personnel have all been consulted on this project for their input on the development of the framework and approach; thus, authoritative stakeholder input is very well addressed but will not be part of a separate data collection endeavor.

As per the studies described by the commenter, it is clear from meta-studies and individual site projects that management effectiveness is affected by, among other factors, governance and local participation (Gill et al., 2017; Bennett and Dearden, 2014; Dalton and Thompson, 2013; Edgar et al., 2014); however, what this project seeks to evaluate is how stakeholders engage with the coastal and marine resources in the study area, the strength and directionality of the interactions, and trends in use and use patterns. These data can then be used to better understand stakeholder interactions, which can feed into management actions, including capacity development and

community engagement.

Finally, as per the suggestion provided by the commenter concerning the change of interview locations and the use of electronic surveys, it is unclear why it is claimed that ferry terminal settings may result in low response rates. In studies conducted by Loftin (2003) and Shivlani and Bruckner (2007) that involved Culebra and Vieques ferry terminal surveys, response rates were 90% or higher for the respective study periods. Also, the project does intend to use electronic surveys (following Dillman, 2014), but these will not be conducted with the authoritative stakeholder group which, again, is outside the scope of this project (at least in terms of their relevance to the LAC framework surveys); instead, authoritative stakeholders will be involved in the project as advisors and to provide information on existing biophysical and social conditions.

Comment 3
The comment, received on August 14, 2017, concerns the exclusion of NGOs and managers as stakeholders from the project, the possibility of introducing new methods related the collection of sociological data that may not be contextually derived, the likelihood that the effort may yield no practical utility, and the pitfalls of using technology in data collection.

The concern that the commenter raises is understandable, in that any data collection effort may be perceived as being from the 'outside', the methods may not be well explained or communicated, and lack of buy-in and exclusive reliance on technology may result in a failed approach. None of these issues is the case of the project, however.

The project will in fact reach out to the various stakeholder boards over the length of the project, following up on much of the outreach that has already been done with agency personnel, stakeholders, and the research community from late 2016 to the present. Managers and

management personnel have been involved in providing input on the project, its approach, and expected findings from the very beginning of the project, and outreach efforts will be continued.

It is not suggested in the project that NGOs and managers are not stakeholders; these groups represent key stakeholders who are involved in the conservation of the region and its resources and who are to be lauded for their efforts. However, the focus of the study is on those stakeholders who utilize the resources for commercial and recreational purposes; thus, many of those surveyed/interviewed as part of the project will in fact be primary stakeholders as defined by their direct uses and secondary stakeholders as defined by their affiliations in interest groups, boards, and NGOs. Ancillary benefits will include a deeper understanding of use dynamics that may be of great interest for other actions and all stakeholders.

The methods for the project involve a combination of in-person and Internet surveys. As per Dillman (2014) and the emergence of excellent, web-based software, Internet surveys (ex., Qualtrics, Survey Gizmo, Survey Monkey) can deliver excellent results. The programs are user-friendly and work across a variety of platforms; importantly, the approach is well accepted and has been tested for several years in a variety of disciplines. Also, the commenter's concerns about the validity of results are well taken; the project has taken several months to canvas the NMC, areas of use, and stakeholders, and it will only utilize methods that are accepted in the literature and are appropriate for the region.

Personnel from DNER, University of Puerto Rico (UPR), the Puerto Rico Reserve and Natural Area management system (part of DNER), and NOAA Fisheries were consulted to obtain their views on data availability, frequency of data collection, and the data collection clarity and housekeeping. All parties involved had several years of experience working in the region, including Dr. Antares Ramos (DNER), Dr. Juan Agar (NOAA Fisheries), Dr. Bob Leeworthy (NMS), Dr. Edwin Hernandez-Delgado (UPR), and Mr. Ricardo Colon-Rivera (DNER). Information provided by these experts and other stakeholders confirmed the approach to be utilized and as is presented here.

9. Explain any decisions to provide payments or gifts to respondents, other than remuneration of contractors or grantees.

No gifts or payments will be offered to respondents.

10. Describe any assurance of confidentiality provided to respondents and the basis for assurance in statute, regulation, or agency policy.

While no formal assurance of confidentiality will be provided to respondents, all respondents will be informed that their responses will be kept private and that their identities will be protected. Where the information is collected in person, this assurance will be provided by the data collectors, who will be trained to that effect. Where the information is collected using an online survey, that information will be provided to the respondent at the commencement of the survey.

11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private.

No such questions of a sensitive nature will be asked.

12. Provide an estimate in hours of the burden of the collection of information.

1. Commercial fishers		
a. Estimated number of participants		90
b. Estimated time per response		30 minutes
c. Estimated burden hours		45 hours
2. Water-based operations		
a. Estimated number of participants		103
b. Estimated time per response		30 minutes

c. Estimated burden hours		51.5 hours
3. Visitor surveys – ferry docks and beaches		
a. Estimated number of participants		2,160
b. Estimated time per response		10 minutes
c. Estimated burden hours		360 hours
4. Registered vessel surveys – boat ramps		
a. Estimated number of participants		480
b. Estimated time per response		10 minutes
c. Estimated burden hours		80 hours
Total respondents		2,833
Total burden hours		536.5 hours

13. Provide an estimate of the total annual cost burden to the respondents or record-keepers resulting from the collection (excluding the value of the burden hours in Question 12 above).

There will be no record keeping/reporting costs to the respondents.

14. Provide estimates of annualized cost to the Federal government.

Budget categories	NOAA funds	Total project
a. Personnel	62,381	62,381
b. Fringe benefits		
c. Travel	3,867	13,867
d. Equipment		
e. Supplies	929	929
f. Procurement		
g. Construction		
h. Other		
i. Total direct charges	77,177	77,177
j. Indirect costs	1,702	1,702
k. Total	78,879	78,879

15. Explain the reasons for any program changes or adjustments.

This is a new information collection request.

16. For collections whose results will be published, outline the plans for tabulation and publication.

The agency will work with the contractor to estimate the stakeholder uses and use patterns across the NMC. Information will be obtained by stakeholder type and different modes of visitation. Emphasis will be placed on determining spatial use areas and building on existing spatial use pattern evaluations (Hernandez-Delgado et al., 2014; Koeneke, 2010), as well as on the stakeholder interactions and conflicts. Also, the project will set parameters to gauge crowding and congestion measurements in support of an LAC framework.

Results will be published as a series of technical reports and peer reviewed publications, and the former will include appendices and a summary of the approach, findings, and conclusions.

17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons why display would be inappropriate.

No such approval is sought.

18. Explain each exception to the certification statement.

No exception is required to the certification statement.