

**EDUCATION AND OUTREACH TO PROMOTE IMPLEMENTATION AND
COMPLIANCE OF FISHERY REGULATIONS IN MONA ISLAND NATURAL
RESERVE, PUERTO RICO**

Phase 2

Final Report

June 2013

Introduction

The Local Action Strategies (LAS) for Puerto Rico have identified overfishing as a top priority in the conservation of coral reefs, since the decline in the populations of target fish species can be detrimental to the reef community and compromise the sustainable use of these resources. Recent changes in the Puerto Rico fisheries regulations by the Department of Natural and Environmental Resources (DNER) have implemented strategies to manage important coral reef communities. Specific regulations including closed seasons and No-Take Zones (NTZ) have been designated to conserve important fisheries species and habitats (see Fisheries Regulations #7949, December 2010). The regulations included a change in the boundaries of the Marine Reserve or No-Take Zone (NTZ) at Mona Island Natural Reserve as well as the prohibition of certain gears such as spears, nets and traps.

Most commercial fishing that currently occurs around Mona Island is hook and line for deep-water (>100m) snappers from ports on the west coast of Puerto Rico (Cabo Rojo, Mayagüez, Aguada, Rincón, Aguadilla). With respect to recreational fishing, a greater variety of shallow water coral reef fish species have been targeted with a diversity of gears. In addition, SCUBA divers commonly harvest shallow water species with spears and collect lobster and conch. Recreational offshore fishermen also target pelagic species around the islands and often anchor overnight at Mona Island. Due to the great extent of the area within the NTZ and the limited interaction between visitors and on site law enforcement staff, compliance with fisheries regulations is challenging.

Coral reef populations at Mona Island are in general less overfished than many locations around Puerto Rico, particularly for predatory species of high fishery importance such as groupers and snappers (Stallings, 2009). Recently fish spawning aggregations (FSA) site for

multiple species were documented at Mona Island by researchers of the University of Puerto Rico. This collaboration between researchers from the University of Puerto Rico and the DNER highlighted the need to improve compliance with fisheries regulations designated to protect the spawning sites of these important coral reef fishes. Protection of these sites is a high priority since these grouper species have disappeared from many coral reefs due to unregulated fishing of FSAs (Ojeda-Serrano, Appledorn & Ruiz-Valentin, 2003). Increasing the awareness of users and DNER staff at Mona Island about the site-specific regulations designed to protect vulnerable coral reef fishery resources is important to help achieve coral reef conservation at the ecosystem level.

The marine habitats around Mona Island support diverse coral reef communities and populations of some snapper and grouper species have a higher abundance and larger size than reefs on the main island of Puerto Rico (Nemeth and Scharer 2010) However unregulated fishing for years at Mona Island has placed it at a midpoint between pristine and degraded reef fish communities across the Caribbean (Stallings 2009); also some key species such as the Nassau grouper and rainbow parrotfish have seen dramatic declines. Several species of grouper form spawning aggregations at Mona Island and require increased protection to reverse overfishing (Ault et al. 2010). These characteristics highlight the need as well as potential of Mona Island Marine Reserve to protect important coral reef resources and to rebuild overfished populations of grouper, snapper and parrotfish.

To promote compliance of regulations and realize the benefits of the management measures the DNER personnel, stakeholders and resource users must be made aware of the rationale and specific details of applicable regulations. This project was designed to address the special circumstances at Mona Island Natural Reserve (MINR). Fisheries management challenges and issues are unique at MINR due to remoteness of this Reserve from the main island of Puerto Rico. Additionally, the offshore location of Mona Island puts this marine protected area (MPA) within a special management situation as US federal jurisdiction waters surround it, where additional regulations apply.

This report describes the outcomes of the second phase of the project. The first phase involved engaging the DNER rangers stationed at Mona Island to provide them with the information needed to improve the compliance of fishery regulations and to obtain information to design a site specific educational campaign. Also the education materials including a video, poster and fact sheet were produced during phase one. The second phase involved the dissemination of the educational materials and conducting questionnaire surveys to gauge the perceptions regarding the fishing regulations at Mona Island.

Objectives

This project was designed for increasing awareness in order to reduce the impacts of overfishing; a focal area for the Coral Reef Task Force as well as the Puerto Rico coral reef Local Action Strategies. The main goal was to educate DNER rangers, stakeholders and visitors to Mona Island Natural Reserve of applicable fisheries regulations at both the local and federal levels. The project was focused on improving the implementation of the fisheries regulations at Mona Island by addressing the following goal and objectives related to the LAS:

Goal 1- Promote public awareness on the importance of coral reef ecosystems.

Objective 1.3- Increase knowledge and understanding of user groups and the general public concerning the importance of regulating fishing activities.

Objective 2.3- Support capacity-building for DNER Rangers.

In order to achieve these objectives the following activities were conducted:

- Produced printed materials (poster, fact sheet) and a video for the educational campaign.
- Conducted an on-site and off-site educational campaign about fisheries regulations for Mona Island Natural Reserve.
- Distributed educational materials to visitors at Mona Island.
- Distributed and promoted educational materials to dive shops, fishing shops, boating stores, marinas and yacht clubs on the west coast of Puerto Rico.
- Obtained and analyzed information on stakeholder's perceptions through surveys at Mona Island Natural Reserve.

Project Location: Mona Island Natural Reserve

Mona Island Natural Reserve is the largest MPA in Puerto Rico (Aguilar-Perera, Shärer & Valdes-Pizzini, 2006) and is located off the west coast of Puerto Rico (Figure 1). The Reserve encompasses 9 nautical miles of local jurisdiction waters but due to its distance from Puerto Rico (40 nautical miles) any vessel crossing the Mona Passage is subject to the EEZ U.S. fisheries regulations established by the Caribbean Fisheries Management Council (CFMC) under NMFS-NOAA. Therefore any local fishing on the insular platform of Mona or Monito Islands is subject to local and federal regulations during transit through the EEZ. In addition, the DNER has modified the boundaries of the NTZ which limits where fishing is permitted. Currently the NTZ extends from shore to 1 nautical mile, however fishing is permitted with hook and line from shore at both campsites (Sardinera & Pájaros).

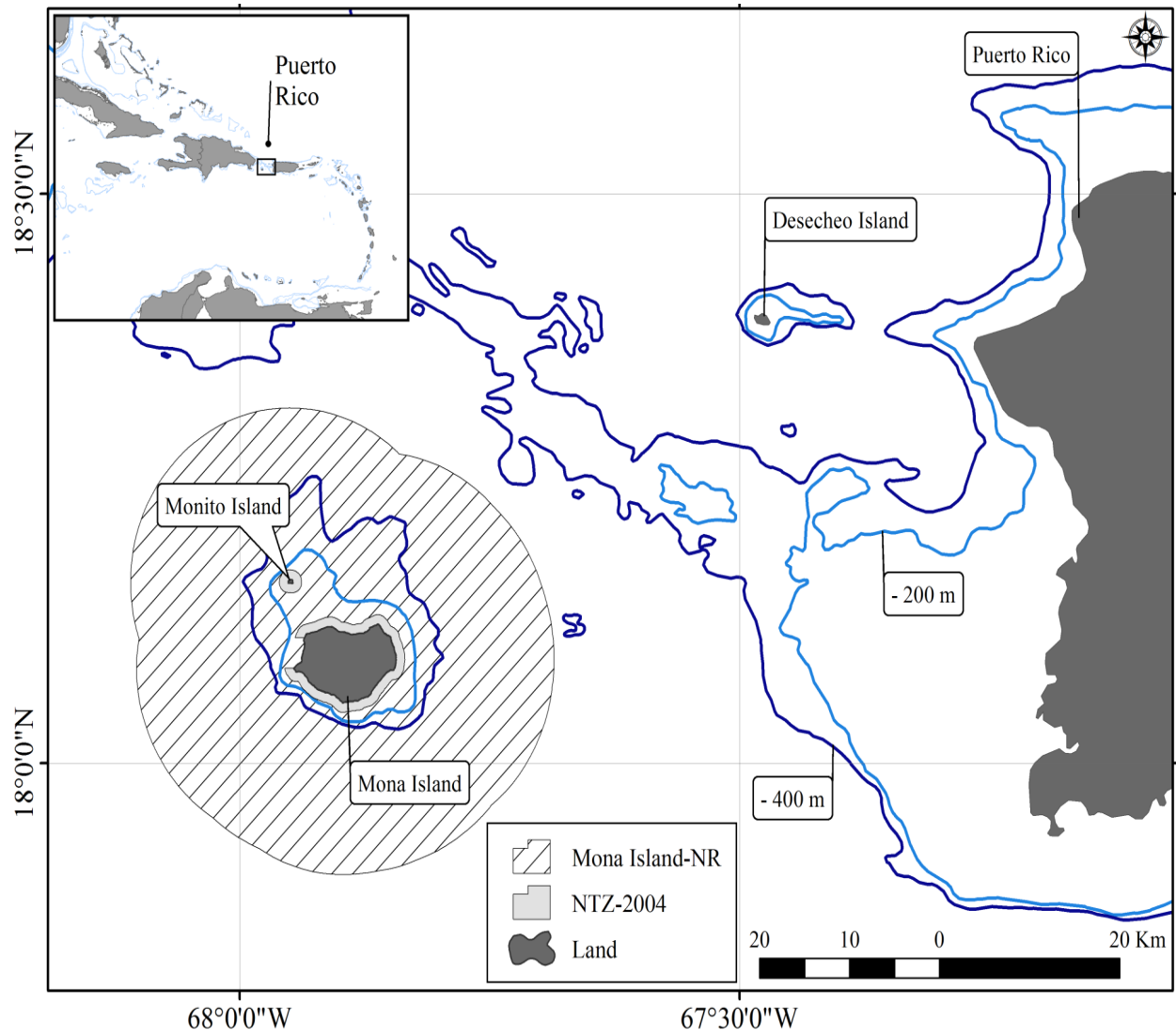


Figure1. Natural Reserve Boundary (9 nautical miles from shore)

Methods

Determining the perception and knowledge of visitors to Mona Island is very important to inform the implementation of the current fisheries regulations by gauging the effectiveness of outreach activities. In order to obtain this information, a semi-structured questionnaire was designed based on the applicable fisheries regulations (DNER Fisheries Regulations #7949, December 2010). The questionnaire consisted of 11 questions (Appendix 1). The main objective of the survey was to determine visitor's knowledge and perception of the following:

- Definition of a marine reserve
- Existence and boundaries of the marine reserve in Mona and Monito
- Which are the current fisheries regulations applicable to Mona and Monito marine reserve
- Allowed and prohibited activities in the marine reserve
- What fishing gear is allowed at Mona Island
- Locations where shore fishing is allowed with hook and line

The surveys were conducted at Mona Island during peaks in the number of visitors camping on the island. Visitors were approached by providing a brief explanation of the project and then they were asked to take part in the survey. The written questions were used to standardize the interview and answers were filled in on the printed questionnaire.

In addition to the surveys, an on-site and off-site educational campaign about fisheries regulations in Mona Island marine reserve was conducted. Both the on-site and off-site educational campaigns included the printing and distribution of three types of educational materials. First, a 17"x14" poster with information about the marine reserve (NTZ) boundaries, fishing gears allowed and prohibited, and Mona and Monito marine reserve boundaries was distributed following the Fisheries Regulations #7949 (Appendix 2). A double sided 5.5"x11" flyer including the aforementioned information and also the closed seasons of some of the most representative species found in Mona Island, was also distributed. A three-minute video was also distributed which describes the boundaries of the reserve along with scenes from Mona Island that help illustrate the key points (<http://www.youtube.com/watch?v=9xwv90Ngho>). These educational materials were delivered in person to dive shops, fishing shops, boating stores, charter vessels, marinas and yacht clubs on the west coast of Puerto Rico. Discussions with the persons at these locations were initiated to answer question about the fisheries

regulation applicable to Mona Island Natural Reserve and the need for these management measures.

Results and discussion

The project visits to conduct the interviews and on-site educational activities at Mona Island Natural Reserve were planned to coincide with the period of the year when visitation is highest. December to April is hunting season for feral goats and pigs on Mona Island. During these months Mona receives most of its visitors for the year. Many of the visitors during this period also engage in recreational fishing and some accompany the hunter groups for the sole purpose of fishing from shore or from small vessels.

Difficulties Encountered

Between January and March 2013 three field trips were made. Although six trips were planned and requested between October and December 2012, only three trips were completed. Half of the requested trips were cancelled by DNER for different reason. The first trip scheduled for January 7-11, 2013 was cancelled by Sergeant Calderin (DNER) because he said all trips requested before January 2013 needed to be requested again and approved by the new DNER Secretary. A trip scheduled for February 19-22, 2013 was cancelled by Carmen D. Rodríguez (DNER) since she said that during that week there were no trips to Mona, resulting in few visitors. It is worth mentioning that the main vessel transporting visitors, *Sacrificio*, was out of commission because of mechanical failures during this time. A trip scheduled for March 11-15, 2013 was cancelled by Sergeant Calderin because the airplane was on scheduled maintenance; since the cancellation was on such short notice, maritime transportation arrangements could not be completed.

Visitor Survey

Between January and March 2013, 559 people visited Mona Island as determined from issued permits, of which 31% were interviewed; for a total of 173 surveys. Seventy-three surveys were used in the test phase and were also included in the totality of the surveys analyzed. Between the two campsites 76.4% of these surveys were given at Pájaros beach and a 23.6% at Sardinera beach. The median of age of persons interviewed was 49 years old. Only 1.6% of the samples were female. Most of the people surveyed were from the towns of: Vega Baja, Trujillo Alto, Peñuelas, San Juan, Quebradillas, Salinas, Arecibo and Río Grande. The great majority (87%) of the visitors surveyed knew about the existence of a marine reserve in the surrounding waters of the island. Most of them (85%) visited Mona between 1 and 3 times

throughout the year. For most visitors, the main purpose of their trip was hunting. On the other hand, fishing was the secondary purpose for 25% of the visitors sampled. This sub-group has been practicing fishing on the island for an average of 10 years or more and 60.9% of these know about the existence of a marine reserve at Mona and Monito. Most of the visitors who answered that fishing was their main purpose for the trip knew that Pájaros and Sardinera beaches are the only places for which they are allowed to fish from shore but they failed to point out the limits of both beaches; not knowing where they start or end. Over all 65 % of those surveyed knew the extension of the marine reserve as one mile from shore and what fishing gears are allowed (Figure 2). When asked about the allowed fishing gears, most answered hook and line fishing; only three persons answered that multiple hooks and traps were allowed by the regulations.

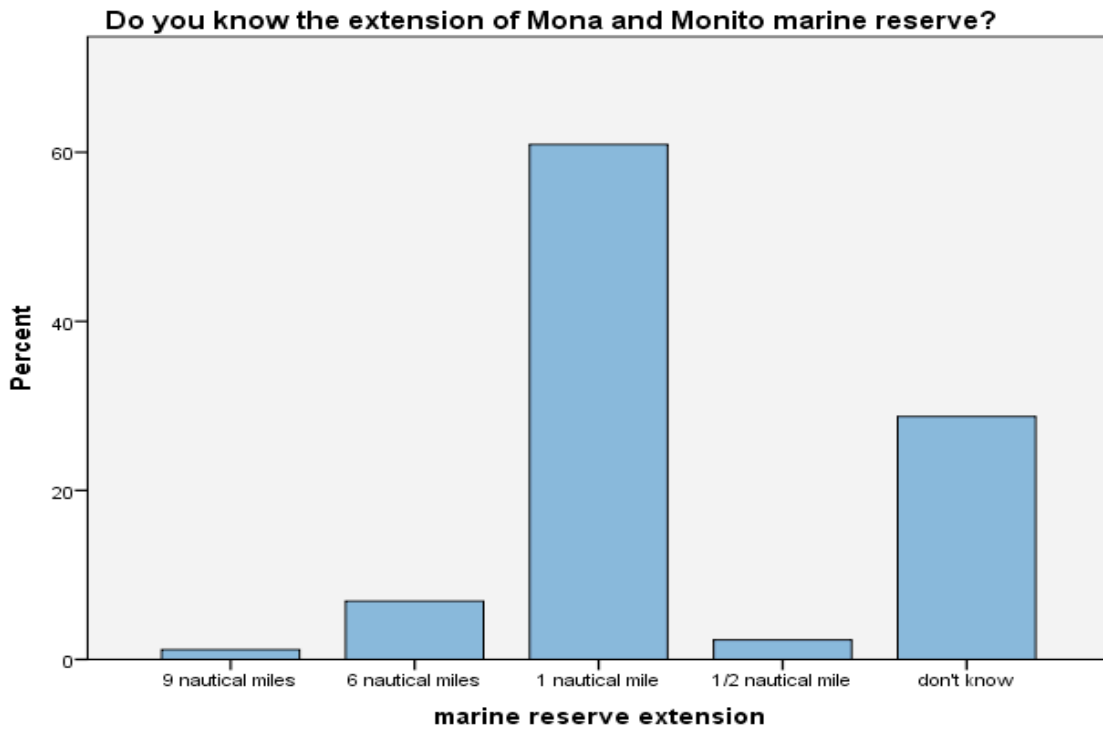


Figure 2. Percentage of the sample who knew the extension of Mona and Monito marine reserve.

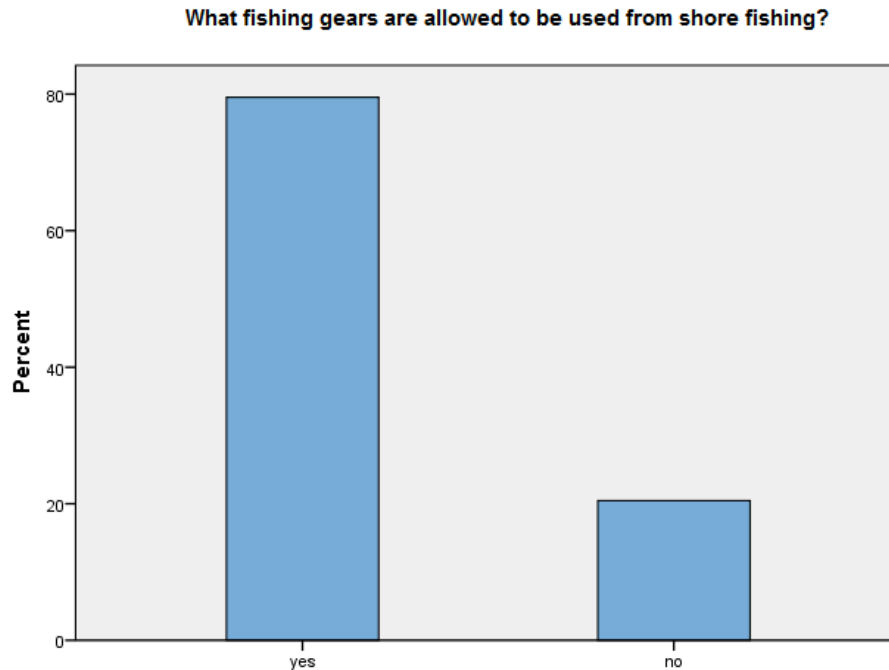


Figure 3. Percentage of the visitors who knew what fishing gears are permitted.

In addition of structured questions, two open questions were used in the surveys. The first question asked them to describe what a marine reserve is. Most of them described it as a protected area where fishing is not allowed. The second question asked if they knew if interventions were made in regard of violations of the existing fishing regulations. The majority of the sample didn't know about interventions made by the DNER; those who knew said they were related to conch and lobster fishing and mentioned that lobsters were fished using spear. In this case they mentioned that only a verbal warning was given by the DNER and no further action was made.

Educational Campaign

During the on-site educational campaign at Mona Island over 200 posters, fact-sheets and videos were distributed to visitors, along with other material provided by Sea Grant Puerto Rico. The educational materials were also provided during to the DNER rangers to distribute to visitors to Mona Island. During phase one a memorandum was circulated by ranger supervisors instructing the rangers to distribute the fact-sheet to visitors.



Figure 4. In the on-site educational campaign in which 173 people were interviewed and over 200 educational materials were distributed



Figure 5. Conducting survey interviews and outreach at Mona Island.

During the off-site educational campaign, 25 places were visited; including dive shops, commercial and recreational fisherman shops, boating stores, charter vessels nautical clubs and regional offices of the Department of Natural and Environmental Resources (Figure 6) (Figure 7). Over 300 materials (posters, flyers, and cd's) were given. Most of the visited places are located within Hormigueros, Rincón, Mayaguez, Aguadilla, Lajas and Cabo Rojo (Appendix 2). These places were visited from December 2012 to March 2013. While we handed out the educational materials, an orientation about fisheries regulations was given. During the orientations, special attention was given to articles 8.2, 8.5, 8.8, 8.18, 8.23, 8.24 and 18.2 of the

Fisheries Regulation #7949. These articles emphasize in allowed and prohibited fishing gears, identify where are the fishing areas in the marine reserves and determine the queen conch (*Strombus gigas*), common lobster (*Panulirus argus*) and groupers (*Epinephelus itajara*, *Epinephelus stiatatus* and *Epinephelus guttatus*) fishing closures. Interviewers gave special attention to these fishing closures. The majority of the people interviewed stated that they are not going to Mona Island to fish. In addition, nautical clubs and fishing stores administrators and/or employees stated that they are not visiting Mona or Monito Island for the sole purpose of fishing.



Figure 6. During the off-site educational campaign DNER regional offices were visited.



Figure 7. As part of the off-site educational campaign, dive shops from Aguadilla, Rincón, Mayaguez and Lajas were visited and provided with educational materials.

Recommendations

Several important conclusions can be highlighted from the analysis of the surveys. Most visitors to Mona Island know about the existence of the marine reserve and also know the extension and location of the “No take” zone. On the other hand, several doubts emerged when they talked about the delimitations of the areas where fishing is allowed and the start/end of federal and DNER fishing seasonal closures. Future education efforts are needed to give special attention to these existing doubts with an emphasis on the regulations that are most important at Mona Island for protecting the coral reef fish community. Education efforts should include the production of material related to these fishing closures. Many of the visitors pointed out that future generations can be educated and given the opportunity to learn about the protection and conservation of the reserve. Most of those interviewed recommended designing educational campaigns directed toward children and youth.

Regional DNER personnel need to prepare visual educational material, such as Power Point presentations used to promote ongoing contact with visitors. The presentations need to include fishing closures, federal and state. They should also distribute fishing calendars, which have the exact starting and ending dates of each season applicable. The educational campaign

has to be extended to all fishing and scuba shops, besides those located in the west coast of Puerto Rico. Radio and television have to be included as a medium to distribute educational campaign regarding protection and conservation efforts in Mona and Monito island. DNER has to distribute the existing Fishing Regulation to all registered fishermen, since most of them do not know about new amendments and uses their ignorance of recent changes as an excuse to break the law. Some interviewees suggested fees need to be applied to recreational fishermen. The monies obtained from these fares, can be used to finance educational campaigns toward the protection fishery resources, some of which are affected tremendously due to fishing during their respective closed seasons. Several visitors recommended that DNER personnel should check their baggage at arrival time, in order to verify fishing gear and see if it is in compliance.

DNER personnel need to be posted in Pájaros camp during hunting season, as a strategy to safeguard that visitors are in compliance of Fishing Law #278 and Fishery Regulation #6768; DNER personnel need to be more proactive in enforcing the law. It is of great importance that these personnel understand the #278 law and #6768 regulations as to start fining those who don't follow the existing fishing law.

The time line of fisheries interventions by DNER law enforcement rangers at Mona Island from the initial designation of the Marine Reserve (No-Take Zone) highlights important issues with the implementation of regulations. According to ranger supervisors, since the initial designation in 2004 until 2011 no interventions of fishery violations were registered at Mona Island. Rangers mentioned at least one intervention during this period, although no official record was found. During this project (2011-2013) three interventions for violations to the fisheries regulations have occurred. This change is possibly the result of involving the rangers as part of the on-site educational campaign as well as the constant contact with ranger supervisors. However when project personnel are not actively present the interaction of the rangers with visitors regarding the fisheries regulations appears to decrease. Moreover, several anecdotal reports of fishing within the marine reserve have been noted, with no corresponding intervention by the rangers. This suggest that more focused oversight needs to be put in place at Mona Island by ranger supervisors to insure a consistent effort in educating the visitors about regulations and conducting interventions when violations occur.

Continuity and consistency will be key to building on the results of this project to improve the compliance of fishery regulations and the effectiveness of the marine reserve at Mona Island. The results of the visitor interviews suggest that many have become aware of the fishing regulations as well as the limits of the reserve and permissible fishing activities. There is a need

for rangers to be more active in continuing to provide the educational information to the public and to intervene with violations. The following steps could help in promoting continuity:

1. The educational materials should be provided to all visitor groups when they obtain the required permits to visit Mona Island.
2. The charter vessels with a concession for transporting passengers to Mona Island should inform visitors of the marine reserve.
3. The distribution of educational materials should continue at Mona Island and pertinent locations in Puerto Rico.
4. The rangers should keep a log of their interaction with visitors to provide the information on fisheries regulations.
5. A person should be tasked with insuring periodically that the above actions are completed.

Appendix 1. Questionnaire used during the interviews.

Género: Nivel de escolaridad:	Edad:	Pueblo:	País:
<p>1. ¿Qué actividades pretende realizar durante su estadía en la Isla Mona?</p> <p><input type="checkbox"/> pesca</p> <p><input type="checkbox"/> caza</p> <p><input type="checkbox"/> avistamiento de aves</p> <p><input type="checkbox"/> buceo ("Scuba")</p> <p><input type="checkbox"/> buceo libre ("snorkeling")</p> <p><input type="checkbox"/> caminatas</p> <p><input type="checkbox"/> investigación</p> <p><input type="checkbox"/> otros: _____</p> <p>2. ¿Cuánto tiempo lleva realizando esta(s) actividad(es) en la Isla de Mona? _____</p> <p>3. ¿Con cuánta frecuencia visita la isla?</p> <p><input type="checkbox"/> es la primera vez</p> <p><input type="checkbox"/> 1 a 3 veces al año</p> <p><input type="checkbox"/> 4 a 6 veces al año</p> <p><input type="checkbox"/> más de 6 veces al año, ¿cuántas? _____</p> <p>4. ¿Qué medio de transporte utiliza para trasladarse hasta la RNIM y M?</p> <p><input type="checkbox"/> embarcación propia</p> <p><input type="checkbox"/> concesionario de transporte marítimo</p> <p><input type="checkbox"/> avión</p> <p><input type="checkbox"/> otra: _____</p> <p>5. ¿Podría mencionar algunos de los recursos marinos que posee la RNIM y M?</p> <p>6. Para usted, ¿qué es una reserva marina?</p> <p>7. ¿Sabe si existe una reserva marina aquí en Mona y Monito?</p> <p><input type="checkbox"/> sí, (pasar a la #8)</p> <p><input type="checkbox"/> no, (pasar a la #9)</p> <p>8. La Reserva Marina alrededor de Mona y Monito se extiende desde la costa hasta:</p> <p><input type="checkbox"/> 9 millas náuticas</p> <p><input type="checkbox"/> 6 millas náuticas</p> <p><input type="checkbox"/> 1 milla náutica</p> <p><input type="checkbox"/> ½ milla náutica</p> <p><input type="checkbox"/> no sé</p> <p>9. ¿Conoce cuáles son las playas en las que se permite pescar en la Isla?</p> <p><input type="checkbox"/> sí, _____</p> <p><input type="checkbox"/> no _____</p>			<p>NOTAS:</p>

10. ¿Conoce cuáles son las artes de pesca permitidas en pesca de orilla?

sí, ¿cuáles? _____

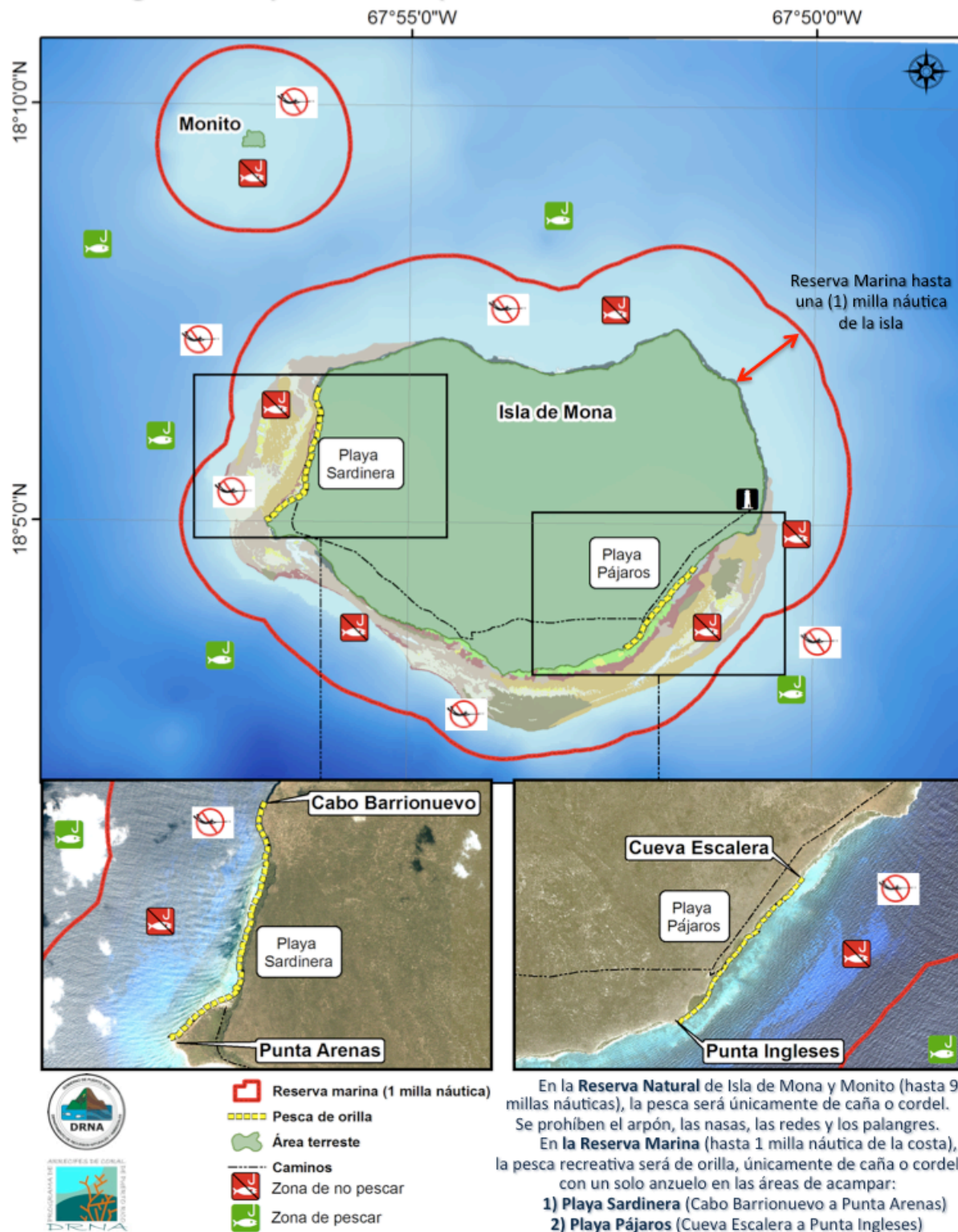
no

11. ¿Usted conoce o ha escuchado de alguna intervención realizada por violación a la Ley de Pesca en Mona o Monito?

sí

no

Reglamentación para las áreas de pesca en la Reserva Natural de Isla de Mona



Appendix 2. Side 1 of educational brochure designed for this project that displays the NTZ.

Appendix 3. List of organizations, agencies, dive shops, fishing shops, boating stores, fish houses, charter vessels, marinas and yacht clubs that were visited by project personnel to distribute educational materials during the off-site educational campaign.

Recipient	Town	Month of delivery	Materials and Quantity
Táino Divers Dive Shop	Rincón	January	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 flyer 1 No Take Zone poster
Sea Marine Breeze Fishing Shop	Mayagüez	January	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 flyer 1 No Take Zone poster
Surfrider NGO	Rincón	January	1 poster
DRNA Gov. Agency	Hormigueros	January	4 cd's 31 No Take Zone posters 1 flyer
The Dive Shop Dive Shop	Mayagüez	January	1 cd 1 No Take Zone poster 1 closed seasons poster (Sea Grant)
La Estación Fishing Shop	Rincón	February	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 No Take Zone poster
Luscar Marine Boating Store	Cabo Rojo	February	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 No take Zone Poster poster
Javier Boats and Parts Service Boating Store	Cabo Rojo	February	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 No Take Zone poster
Club Náutico de	Cabo Rojo	February	1 cd 1 book of Fishes of Puerto

Boquerón Yacht Club			Rico and US Virgin Islands 1 flyer 1 No Take Zone poster
Club Deportivo del Oeste Yacht Club	Cabo Rojo	February	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 flyer 1 No Take Zone poster
Puerto Rico Technical Diving Center Dive Shop	Aguadilla	February	1 cd 1 No Take Zone poster 1 closed seasons poster (Sea Grant)
Pep Marine Fishing Shop	Cabo Rojo	March	1 cd 2 books of Fishes of Puerto Rico and US Virgin Islands 1 No Take Zone poster
Mona Aquatics Charter Vessel	Cabo Rojo	March	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 closed seasons poster (Sea Grant)
Marina Pescadería Marina	Cabo Rojo	March	3 No Take Zone posters 1 book of Fishes of Puerto Rico and US Virgin Islands
Timón General Store Fishing Shop	Cabo Rojo	March	1 cd 1 No Take Zone poster
MB Fishing Fishing Shop	Cabo Rojo	March	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 No Take Zone poster
Adventures Tourmarine Charter Vessel	Cabo Rojo	March	1 No Take Zone poster 1 book of Fishes of Puerto Rico and US Virgin Islands
Paradise Scuba and Snorkeling Center Dive Shop	Lajas	March	1 cd 1 No Take Zone poster 1 closed seasons poster (Sea Grant)

Papayo Divers Dive Shop	Lajas	March	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 No Take Zone poster
Pescadería Hernán Fish Vendor	Lajas	March	1cd 1 book of Fishes of Puerto Rico and US Virgin Islands 2 No Take Zone posters
DRNA Vigilantes	Lajas	March	1 cd 1 No Take Zone poster
West Divers Dive Shop	Lajas	March	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 No Take Zone poster 1 closed seasons poster
DRNA Marítima	Aguadilla	March	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 2 No Take Zone posters
DRNA Vigilantes	Aguadilla	March	4 cd's 3 No Take Zones posters
Aquatica Dive Shop	Aguadilla	March	1 cd 1 book of Fishes of Puerto Rico and US Virgin Islands 1 No Take Zone poster