

Puerto Rico LAS Review
Recently Funded Projects Associated with Overfishing (2011-2014)

Final Report

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Appendix A - Acronyms

CFMC – Caribbean Fisheries Management Council

CRCP – Coral Reef Conservation Program

CRTF – Coral Reef Task Force

DNER – Department of Natural and Environmental Resources

EEZ – Exclusive Economic Zone

FY – Fiscal Year

JOBANERR – Jobos Bay National Estuarine Research Reserve

LAS – Local Action Strategies

MPA – Marine Protected Area

NER – North East Reserves

NGO – Non-Governmental Organization

NMFS – National Marine Fisheries Service

NOAA – National Oceanic and Atmospheric Administration

NOS – National Ocean Services

PSA – Public Service Announcement

UPR – University of Puerto Rico

1.0 INTRODUCTION:

To provide guidance for the allocation of federal funding towards conservation of coral reefs, Congress passed the [Coral Reef Conservation Act of 2000](#), which provided the National Oceanic and Atmospheric Administration (NOAA) with the authority to establish grants and a national program to conserve coral reef ecosystems known as the Coral Reef Conservation Program (CRCP). CRCP efforts from 2002 to 2008, focused on 13 key goals aimed at understanding coral reef ecosystems and reducing negative impacts of human activities. These goals are expressed in the document [U.S. National Action Plan to Conserve Coral Reefs](#) as adopted by the U.S. Coral Reef Task Force (CRTF) in 2000. The CRTF then guided local jurisdictions to come up with their own set of threat-based priorities and key actions within the blueprint of the national goals to improve coordination for implementation of coral reef ecosystem conservation. For Puerto Rico, local managers and experts recommended developing local action strategies (LAS) around 4 focus areas: overfishing, land-based sources of pollution, recreational overuse, and lack of awareness. Each focus area was then assigned a team of experts who met periodically with guidance from State and Federal partners from 2003 to 2005 and created the *Puerto Rico Report on Local Action Strategies to Protect Coral Reefs*. The Overfishing Working Group included representatives from: NOAA CRCP, National Marine Fisheries Service (NMFS), Department of Natural and Environmental Resources (DNER), Caribbean Fisheries Management Council (CFMC), University of Puerto Rico (UPR), and Sea Grant College Program (Sea Grant). This collaborative effort to improve coordination and implementation of coral reef ecosystem conservation across local, regional and national levels led to significant accomplishments with regards to overfishing; however, this same strategy was not duplicated in more recent efforts.

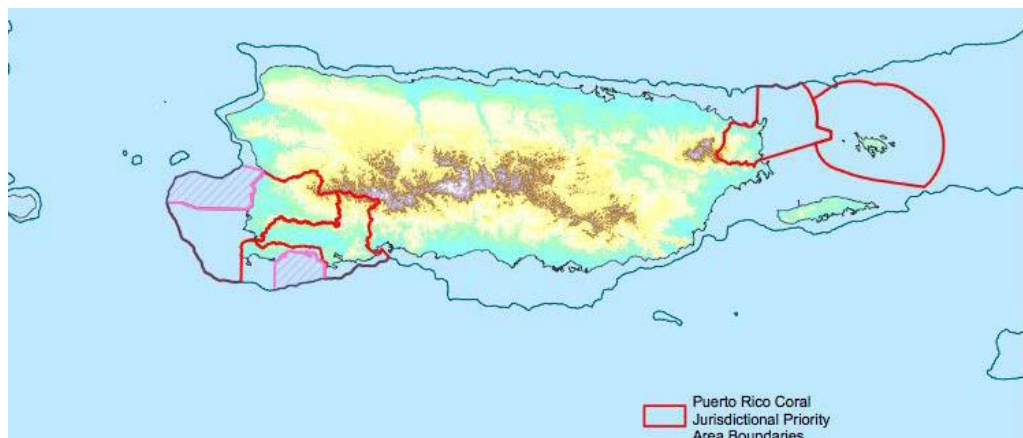
Projects under the focus area of overfishing in the Puerto Rico LAS 2003-2005 document were directed at solving 5 key issues: (1) the approval of regulations for Fishery Law 278, (2) executing fishing laws and regulations, (3) designation of no-take zones, (4) non-fishing impacts to habitat, and (5) unregulated fishing activities that result in degradation of coral reefs. A recent report titled *Puerto Rico Local Action Strategy Projects for Coral Reef Conservation: Overfishing (2003-2010)*, tracked the progress of 37 these projects and found that by 2013, 27 (73%) had been completed, 3 (8%) were in progress and 8 (22%) were not carried out. Highlighting the accomplished actions were 12 projects geared towards the development of educational workshops for maximizing the DNER Rangers Corps' capacity for executing fishing laws and regulations. Likewise, 5 out of the 8 projects that did not achieve completion were still related to law enforcement issues, stressing that compliance with the existing fishing regulations remains the area with the largest room for improvement for the conservation of coral reef ecosystems. On the other hand, the educational materials produced as a result of the completed workshops laid the groundwork for the continuous instruction to fishers and enforcers. A summary of the topics covered in the presentations given during workshops conducted from 2002 to 2009 is provided in Appendix B.

To make the most of limited resources and to have the largest impact to reverse general declines in coral reef health, the CRCP national priorities were refined and redirected in 2010 to focus on climate change impacts, fishing impacts and impacts from land-based sources of pollution in a document titled, [NOAA Coral Reef Conservation Program Goals and Objectives 2010-2015](#). At the jurisdictional level, managers were then directed to select a common set of goals and identify priority areas or locations for implementing conservation actions based on the biological value, degree of risk and threat, and management effectiveness of each place. The core group of reef managers from Puerto Rico developed goals and objectives focusing on 4 issue areas (land-based sources of pollution, fisheries, human impacts and climate change) to be addressed at 4 priority sites (Culebra, North East Reserves, Guánica and Cabo Rojo; Figure 1), that are outlined in [Puerto Rico's Coral Reef Management Priorities](#). These issue areas were further defined by diverse groups of stakeholders during two day workshops for each priority site in a new Local Action Strategy (LAS) document for Puerto Rico prepared in 2011. The 2011 Puerto Rico LAS document was intended to help guide implementation of specific priority conservation actions identified by jurisdictional partners with assistance from the CRCP, particularly in selected priority management areas.

This report provides a brief description of projects funded by NOAA's CRCP which address fishing impacts in Puerto Rico for the period from FY11 to FY14. Funded project summaries were compared against projects proposed under the [Local Action Strategies for Coral Reef Conservation 2011-2015](#), which is intended to serve as a guide for the conservation and protection of the coral reefs ecosystems in Puerto Rico. By determining how many of the funded projects match those proposed in the latest Puerto Rico LAS document, managers will be able to identify where fishing impacts are already being addressed and where action is still needed. This comparison also highlights how funding is being distributed amongst the priority management locations and how effective the action-oriented strategies of the Puerto Rico LAS 2011-2015 have been in addressing fishing impacts.

Figure 1. Map of the 4 Puerto Rico Coral Jurisdictional Priority Area Boundaries.

Source: Puerto Rico LAS 2011-2015 document



2.0 Coral Reef Conservation Program Funded Projects

This section provides a brief description of all CRCP funded projects that address fishing impacts for the period from FY11 – FY14. A summary of the information from this section is provided in Table 1.

2.1 CRCP Internal Funding

Every year, the CRCP sends out an internal Request for Proposals to provide the opportunity for NOAA employees to compete for program funding to conduct projects that are applicable at both the national and the jurisdictional level. This is an opportunity for personnel within the NOAA line offices to actively write proposals through CRCP and act as project managers. Projects can be awarded funds for a maximum of 3 years.

MAPPING FISH HABITAT USE AND REEF FISH SPAWNING AGGREGATIONS IN THE US CARIBBEAN TO INFORM MARINE RESERVE MANAGERS:

This project was created to develop and apply underwater remote sensing technologies to locate, map distribution, and estimate biomass of key fish taxa and spawning aggregations in the Northeast Reserves (NER). This product builds upon previous CRCP characterizations of benthic habitats and the identification of important habitat features in the NER in order to provide products for managers to inform the design of new reserves and assess the effectiveness of existing marine reserves. The 3-year project is led by NOS, National Center for Coastal Ocean Services.

Funding Allocation: \$52,820 FY12; \$55,416 FY13; \$58,234 FY14

SUPPORT OF THE EFFECTIVE MANAGEMENT OF TWO PRIORITY MPAs IN PUERTO RICO:

This project provided funds for a community coordinator assigned to 2 priority marine protected areas (MPAs) in Puerto Rico, the Luis Peña Channel Natural Reserve (Culebra) and the Cordillera Reefs Natural Reserve (Fajardo). The position received 2 years of funding (FY11 and FY12) for the development and implementation of outreach and education activities to engage stakeholders from surrounding local communities in the implementation of management activities for both MPA sites. The project was led by NOS, Office of Ocean and Coastal Resource Management.

Funding Allocation: \$70,000 FY11; \$70,000 FY12

SCOPING FOR NORTHEAST CORRIDOR NATURAL RESERVE INTEGRATED MANAGEMENT PLAN:

This project responds to the DNER's request for direct assistance from NOAA in the development of an integrated multi-stakeholder management plan and marine zoning framework

for 2 of Puerto Rico's coral reef priority areas: NER and Culebra. The project will result in collaboration among different NOAA offices, other federal agencies, the Commonwealth government, and local non-governmental organizations (NGO's). The management plan will integrate feedback on ecological, socioeconomic, and management issues. The 3-year project is led by NOS, Office of Ocean and Coastal Resource Management. An additional year of funding has been requested to complete the plan.

Funding Allocation: \$97,343 FY12; \$197,026 FY13; \$191,000 FY14

PUERTO RICAN COMMERCIAL FISHERMEN'S PERCEPTION OF MARINE PROTECTION MEASURES AND MANAGEMENT STRATEGIES:

This study examined the socioeconomic performance of MPAs and seasonal closures and their efficacy as management tools. The results of this project serve to update CRCP data on commercial fishermen's perspectives about the effectiveness of selected area and seasonal closures in Puerto Rico dating back to 2003. The 1-year project was led by NMFS, Southeast Fisheries Science Center.

Funding Allocation: \$55,000 FY13

DEFINING SPAWNING DYNAMICS TO MANAGE AND CONSERVE REEF FISH POPULATIONS:

Because commercially important species of large groupers that gather annually to spawn are highly susceptible to overfishing, better information on their aggregations in terms of location, species, timing and abundance is needed for proper management of stocks. This project is using acoustic methods that have been proven off western Puerto Rico to locate, assess, and monitor reef fish spawning aggregations in the NER. The multi-year project began in FY14 is led by NMFS, Southeast Fisheries Science Center.

Funding Allocation: \$78,500 FY14

2.2 CRCP State and Territorial Coral Reef Conservation Cooperative Agreement

Since 2001, CRCP has provided annual funding to eligible state, territorial, and commonwealth agencies for conservation projects in coral reef jurisdictions. This funding, in the form of annual cooperative agreements, was dedicated to development and implementation of numerous projects and activities guided by the established national and jurisdictional priority documents. Eligible applicants are limited to state, territorial, and commonwealth natural resource management agencies that were appointed by the respective governors to serve as the primary point of contact for coral reef conservation activities in each of the jurisdictions.

MONITORING OF CORAL REEFS

Coral and fish monitoring has been done annually since 2004 with baseline characterizations of several sites dating back to 1999. This project documents the status of reef species of ecological and economic importance, tracks and assesses changes in reef communities in response to environmental stressors or human activities, evaluates the effectiveness of specific management strategies, and identifies actions for future adaptive responses.

Funding Allocation: \$105,680 FY11; \$105,680 FY12; \$130,000 FY13; \$130,000 FY14

LIONFISH WORKSHOPS

This project engages tourist service providers, recreational divers, and commercial fishers in the collection and removal of lionfish by providing them with training, and special permits for removal of these animals in no-take reserves.

Funding Allocation: \$13,000 FY13; \$13,000 FY14

RANGER CORPS STRATEGIC PLAN

This project is performing a comprehensive evaluation of the DNER Ranger Corps to formulate an achievable and workable strategic plan for the Corps. The goal of this plan will be to promote efficiency and effectiveness in their mission of protecting natural resources, including coral reef environments and surrounding areas.

Funding Allocation: \$10,350 FY13; \$10,350 FY14

REGULATED MARINE SPECIES GUIDE

A new marine species regulations guide was developed in a ring-bound format for ease of updates, by replacing pages when specific regulations change. The amount of guides printed was limited. Guides were made available by distribution during workshops for the general public, fishers, and DNER Rangers.

Funding Allocation: \$6,400 FY13; \$6,400 FY14

LIONFISH IN A CULINARY FESTIVAL

This project introduced lionfish in the SoFo Festival, a popular culinary festival in San Juan. Lionfish were prepared in specialty dishes and showcased by several participating restaurants. This provided an educational opportunity and recognition for island chefs. Both recreational and commercial fishermen were involved in supplying the lionfish. The Puerto Rico Tourism Company was a major partner. The activity lasted 3 days and included an exhibit hall with educational displays and personnel who talked about the biology of this invasive species.

Funding Allocation: \$12,500 FY13; \$12,500 FY14

AWARENESS ACTIVITY FOR ISLA VERDE MARINE RESERVE

This project delineated the reserve boundaries with markers and developed a reserve management plan. Funds were also used to conduct a series of activities to increase awareness regarding the natural reserve.

Funding Allocation: \$4,500 FY13; \$4,500 FY14

PUERTO RICO RAPID RESPONSE CONTINGENCY PLAN FOR CORAL BLEACHING, DISEASE OUTBREAKS, AND OTHER ECOLOGICAL SURPRISES

This project aimed at increasing coral reef resilience through effective management strategies. A plan was set for identifying, understanding, and communicating risks and vulnerabilities of U.S. coral reef ecosystem services.

Funding Allocation: \$11,500 FY11; \$11,500 FY12

PUERTO RICO ARTIFICIAL REEF EVALUATION ON THE EAST COAST

The project conducted an inventory of the amount of shipwrecks to assess and document their location and size, determine the benthic habitat where the shipwrecks were located, conduct fish censuses, and categorize the structures as viable alternative sites for the recreational diving industry. The project also determined which of the wrecks would require preparation work in order not to be safe for divers and stable in terms of not impacting nearby habitats during severe weather. This inventory will help DNER decide which of these structures may be considered for promotion as artificial reefs to visit during periods when natural reefs are particularly sensitive (e.g. during spawning and bleaching events).

Funding Allocation: \$40,000 FY11; \$40,000 FY12

CAPACITY BUILDING PROGRAMS FOR DNER RANGERS ON CORAL REEFS, OTHER MARINE ECOSYSTEMS AND RELATED LAWS AND REGULATIONS

Workshops for DNER Rangers included:

- 1) Mona and Monito Reserve regulations, intervention protocol, and discussion of legal cases in the Reserve. Facilitated by Jobos Bay National Estuarine Research Reserve (JOBANERR), Sea Grant, and Centro Interdisciplinario de Estudios del Litoral. Date: October 18, 2011.
- 2) Training was given to 23 DNER Rangers on Puerto Rico regulations and intervention protocols. Facilitated by NOAA-Office of Law Enforcement and DNER. Dates: October 9, 16, 29, 2012.
- 3) Training of 20 DNER Rangers on Highly Migratory Species compliance procedures. Facilitated NOAA-Office of Law Enforcement. Date: March 12, 2013.

- 4) Training on identification of Puerto Rico regulated fish species. Facilitated by DNER.
Date: Various throughout 2013.

2.3 Domestic Coral Reef Conservation Grants and NGO Partnership Cooperative Agreement

The Domestic Coral Reef Conservation Grant awards are intended for institutions of higher education, non-profit organizations, commercial organizations, and local and Indian tribal government agencies. U.S. federal, state, territory and commonwealth governments and Regional fishery Management Councils are not eligible to apply under this funding category. This NGO Partnership Cooperative Agreement is a competitive funding mechanism for NGOs with non-profit 501(c)(3) status and demonstrated expertise and experience in supporting coral reef management in the United States to submit proposals to partner with NOAA CRCP on work plans lasting from 12 to 18 months.

SUSTAINING CORAL REEF FISHERIES IN PUERTO RICO

The University of Miami Rosenstiel School of Marine and Atmospheric Science conducted training workshops for Puerto Rico fisheries scientists and managers in new coral reef stock assessment technologies developed with funding from the National Fish and Wildlife Foundation. The aim of this project was to build institutional capacity for analyzing the sustainability of exploited species and providing the basis for formulation of rational management policies for coral reef fisheries. Sustainable levels of fishing refer to the ability of an exploited stock to produce goods and services, including yields at sustainable levels in the short-term, while maintaining sufficient stock reproductive capacity to continue providing these goods and services into the indefinite future.

Funding Allocation: \$55,398 FY12

EDUCATIONAL PRODUCTS IN SUPPORT OF CULEBRA'S NO TAKE MARINE PROTECTED AREA IN PUERTO RICO

The local NGO, CORALations, Inc., updated 3 existing interpretive signs located at terrestrial access points to protected areas around Culebra. The updates included information on ongoing research on Culebra's coral reef resources, as well as a redesign of coral reef etiquette messages to a format that can be more easily maintained by local students and visiting volunteers.

Funding Allocation: \$10,140 FY11

IMPROVED RESERVE MANAGEMENT THROUGH COMMUNITY PARTICIPATION

The Tres Palmas Marine Reserve at Rincón has no on-site staff, dedicated enforcement officers, or office space. The University of Puerto Rico-Mayagüez provided support for increasing community participation with the Tres Palmas Marine Reserve by facilitating the integration of a local NGO into the local conservation management plan, and designing a Volunteer Ranger

program to address the need for improved regulatory compliance and management of threats to the reserve.

Funding Allocation: \$18,734 FY11

2.4 CRCP Fishery Management Council Coral Reef Conservation Cooperative Agreements

The CRCP provides funding to four of the regional fishery management councils for projects to conserve and manage coral reef fisheries. The councils submit applications that cover a project period of three years, and once awarded, recipients need not compete for funding in subsequent years.

CHARACTERIZATION OF BENTHIC HABITATS AND ASSOCIATED CORAL REEF COMMUNITIES AT TOURMALINE REEF, PR

This project was part of the Caribbean Fisheries Management Council (CFMC) mapping and habitat characterization of deeper water coral reefs in the U.S. Caribbean Exclusive Economic Zone (EEZ). Information on fish populations in deeper coral reef habitats off the west coast of Puerto Rico was collected which enabled the CFMC to justify proposed amendments to the existing fishing regulations for improving conservation and ensuring Federal measures are complementary with those in state or territorial waters.

Funding Allocation: \$173,755 FY11

CHARACTERIZATION OF DEEP REEF BENTHIC HABITATS OF QUEEN SNAPPER IN MONA PASSAGE, PR

The deep reefs in the Puerto Rico fault zone, a submerged section of the Antillean ridge that extends across the entire Mona Passage serve as the main habitats of the queen snapper (*Etelis oculatus*) and other snapper and grouper species that represent the most important finfish assemblage of the Puerto Rican fishery. In pursuit of queen snapper at depths between 250 – 500 m fishermen identified zones of “high biological diversity” where an increased number of fish species are caught and frequent entanglements of their fishing gear with corals and sponges occur. Using the Woods Hole Oceanographic Institute's SeaBED AUV, the Council was able to: 1) explore and map the seafloor features that serve as habitat of deep reef snapper and grouper species in Mona Passage; 2) inventory of the sessile-benthic, motile megabenthic invertebrate and fish species associated with these deep reef habitats; 3) examine the relationship between coral habitats and the diversity and community structure of deep reef fishes; 4) provide geophysical and photographic documentation of the deep snapper/grouper habitats. The field work has been complete and data is being analyzed.

Funding Allocation: \$250,000 FY13

MODEL AND DATA BASED CONNECTIVITY STUDY FOR THE MARINE PROTECTED AREA NETWORK OFF WESTERN PUERTO RICO

This project seeks to conduct modeling studies that will provide quantitative information in support of the management of the marine protected area (MPA) network in Federal waters off the west coast of Puerto Rico, which includes: Bajo de Sico, Tourmaline Bank and Abrir la Sierra Bank. The CarICOOS model assessment tools (<http://www.caricoos.org/zplayer/roms3>) can be used to determine the path and final destination of the eggs and larvae spawned from federally managed areas such as Bajo de Sico. The final product will include estimates of a recruitment connectivity matrix for the west coast of PR.

Funding Allocation: \$150,934 FY14

Table 1. Summary of CRCP Funded Projects (20011-2014)

Project Title	Funding Source	FY	Priority Area	NOAA Line Office, State Agency or Entity Leading Work	Total Funding Received
Mapping Fish Habitat use and Reef Fish Spawning Aggregations in the US Caribbean to Inform Marine Reserve Management	CRCP Internal Funds	2012, 2013, 2014	NER	NOS	\$166,470
Support for the Effective Management of Two Priority Coral Reef MPAs in Puerto Rico	CRCP Internal Funds	2011, 2012	NER and Culebra	NOS	\$140,000
Scoping for North-East Corridor Natural Reserve Integrated Management Plan	CRCP Internal Funds	2012, 2013, 2014	NER and Culebra	NOS	\$485,369
Puerto Rican Commercial Fishermen Perceptions of Marine Protective Measures and Management Strategies	CRCP Internal Funds	2013	All	NMFS	\$55,000
Defining Spawning Dynamics to Manage and Conserve Reef Fish Populations	CRCP Internal Funds	2014	NER and Culebra	NMFS	\$78,500
Monitoring of Coral Reefs	CRCP State and Territorial Coral Reef Conservation Cooperative Agreements	2011-2012, 2013-2014	All	DNER	\$471,360
Lionfish Workshops	CRCP State and Territorial Coral Reef Conservation Cooperative Agreements	2013-2014	All	DNER	\$26,000

Ranger Corps Strategic Plan	CRCP State and Territorial Coral Reef Conservation Cooperative Agreements	2013-2014	All	DNER	\$20,700
Regulated Marine Species Guide	CRCP State and Territorial Coral Reef Conservation Cooperative Agreements	2013-2014	All	DNER	\$12,800
Lionfish in a Culinary Festival	CRCP State and Territorial Coral Reef Conservation Cooperative Agreements	2013-2014	All	DNER	\$25,000
Awareness Activity for Isla Verde Marine Reserve	CRCP State and Territorial Coral Reef Conservation Cooperative Agreements	2013-2014	Other	DNER	\$9,000
Puerto Rico Rapid Response Contingency Plan For Coral Bleaching, Disease Outbreaks, and Other Ecological Surprises	CRCP State and Territorial Coral Reef Conservation Cooperative Agreements	2011-2012	All	DNER	\$23,000
Puerto Rico Artificial Reef Evaluation on the East Coast	CRCP State and Territorial Coral Reef Conservation Cooperative Agreements	2011-2012	NER	DNER	\$80,000
Capacity Building Programs for DNER Rangers on Coral Reefs, Other Marine Ecosystems and Related Laws and Regulations	CRCP State and Territorial Coral Reef Conservation Cooperative Agreements	2011-2012, 2013-2014	All	DNER	not specified
Sustaining Coral Reef Fisheries in Puerto Rico	Domestic Coral Reef Conservation Grant and NGO Partnership Cooperative Agreement	2012	All	University of Miami RSMAS	\$55,398
Educational Products in Support of Culebra's No Take Marine Protected Area In Puerto Rico	Domestic Coral Reef Conservation Grant and NGO Partnership Cooperative Agreement	2011	Culebra	CORALations Inc.	\$10,140
Improved Reserve Management Through Community Participation	Domestic Coral Reef Conservation Grant and NGO Partnership Cooperative Agreement	2011	Other	UPR Mayaguez	\$18,734
Characterization of benthic habitats and associated coral reef communities at Tourmaline Reef, PR	Fishery Management Council Coral Reef Conservation Cooperative Agreement	2011	Cabo Rojo	CFMC	\$173,755
Characterization of Deep Reef Benthic Habitats of Queen Snapper in Mona Passage, PR	Fishery Management Council Coral Reef Conservation Cooperative Agreement	2013	Other	CFMC	\$250,000
Model and Data Based Connectivity study for the Marine Protected Area Network off Western Puerto Rico	Fishery Management Council Coral Reef Conservation Cooperative Agreement	2014	Cabo Rojo	CFMC	\$150,934

3.0 Puerto Rico LAS 2011-2015 Fishing Impacts Proposed Projects

This section covers the projects listed in the Puerto Rico *Local Action Strategies (LAS) for Coral Reef Conservation 2011-2015* document that either directly addresses fishing impacts or that, although focused on a different issue, include actions that indirectly relate to the conservation and management of Puerto Rico fisheries. Projects were broken out by priority areas following the format presented in the Puerto Rico LAS 2011-2015 including the page number where the project information can be found in the document. The proposed actions include a brief rationale on how each one relates to fishing impacts based on the available project description from LAS document. A summary of the information provided in this section is provided in Table 2.

3.1 All priority locations

PROJECT 4: CAPACITY BUILDING PROGRAM FOR DNER RANGERS ON CORAL REEFS AND OTHER MARINE ECOSYSTEMS AND RELATED LAWS AND REGULATIONS (p. 9)

This action aims at enhancing enforcement programs through education to encourage public compliance with fishing regulations and reduce impacts of fishing to coral reef ecosystems.

Corresponding Funded Project – CAPACITY BUILDING PROGRAM FOR DNER RANGERS ON CORAL REEFS, OTHER MARINE ECOSYSTEMS AND RELATED LAWS AND REGULATIONS – Although several workshops have been conducted from 2011 to 2014 more funding is needed for workshops to occur in a continuous basis in order reach a larger portion of DNER Rangers and also to refresh key information when changes to the regulations are made.

PROJECT 5: CREATE OUTREACH AND EDUCATION CAMPAIGN TO REDUCE FISHING IMPACTS ON CORAL REEF ECOSYSTEMS AIMED AT: A) RECREATIONAL FISHING COMMUNITY, B) COMMERCIAL FISHING COMMUNITY, C) BOAT OWNERS (p. 9)

This action aims at providing education to recreational fishers, commercial fishers and boaters for strengthening their understanding of impacts their actions may cause on coral reef ecosystems.

Corresponding Funded Project – None found

PROJECT 6: CREATE ID CARDS WITH IMAGES OF FISH AND REEF ETIQUETTE (p. 9)

This action aims at providing management tools that can improve efficiency of enforcement operations.

Corresponding Funded Project – REGULATED MARINE SPECIES GUIDE – the outcome of this project partially meets the proposed action description because only a limited amount of guides were printed and the guide does not include information on reef etiquette.

PROJECT 12: ENGAGE TOURIST SERVICE PROVIDERS, RECREATIONAL DIVERS, AND COMMERCIAL FISHERS IN THE LOCATION AND REMOVAL OF LIONFISH THROUGH TRAINING AND SPECIAL PERMITS (FISH REMOVAL IN NO-TAKE RESERVES) AND CREATE PROMOTIONAL CONSUMER CAMPAIGN TO MARKET LIONFISH TO RESTAURANTS AND FOOD-STANDS (p. 9)

This action aims at teaching people about invasive lionfish, how they affect coastal and marine ecosystems, and how they can help *mitigate this problem*.

Corresponding Funded Project – LIONFISH WORKSHOPS – Permits are being offered by DNER and there have been several PSAs promoting lionfish removal. Booklets with handling and cooking instructions have been created and distributed with help from Sea Grant. Although this project has been completed, this action needs to be repeated periodically in order to be more effective and reach a wider audience.

Corresponding Funded Project – LIONFISH IN A CULINARY FESTIVAL – On the week prior to the event, local newspapers, television stations, and radio networks promoted the event. The inclusion of lionfish received additional media coverage. The SOFO activity lasted 3 days and personnel from NOAA, DNER and Sea Grant oriented the general public about the biology of this invasive species. Visitors were asked to complete an attendance sheet, but the number of visitors is yet not available. This project can be considered to be completed.

3.2 Culebra Island

PROJECT 16: DEVELOP A FORMAL COLLABORATION AGREEMENT BETWEEN DNER RANGERS AND THE POLICE (FURA) TO STRENGTHEN ENFORCEMENT OF LAWS AND REGULATIONS (p.24)

This action is aimed at developing a written collaborative agreement between DNER and the Police Superintendent in order to organize training for police officials or integrate them in the DNER Ranger trainings.

Corresponding Funded Project – None found

PROJECT 20: ARTIFICIAL CORAL REEFS AND ECOSYSTEM-BASED APPROACHES TO ENHANCE CORAL REEF RESILIENCE WITHIN THE CANAL LUIS PEÑA NO-TAKE NATURAL RESERVE, CULEBRA ISLAND, PR (p. 27)

This action aims at promoting the recovery of coral and fish communities within the Canal Luis Peña No-Take Natural reserve through the combined use of coral farming and semi artificial reefs. These structures are expected to also serve as benthic and mid-water fish aggregating devices as well increase larval recruitment and juvenile fish shelter.

Corresponding Funded Project – None found

PROJECT 21: LONG-TERM ECOLOGICAL MONITORING IN SUPPORT OF MANAGEMENT OF THE CULEBRA ISLAND NO-TAKE MPA NETWORK (p. 28)

This action aims to support management by conducting long-term monitoring of coral reef benthic and fish communities within Canal Luis Peña Natural Reserve.

Corresponding Funded Project – There are no monitoring stations in Culebra as part of the current NOAA National Coral Reef Monitoring Plan.

PROJECT 22: COMMUNITY-BASED DESIGNATION AND MANAGEMENT OF BAHIA FLAMENCO NO-TAKE NATURAL RESERVE (p. 29)

This action is aimed at designating a no-take natural reserve extending up to 1.6 km offshore from Bahia Flamenco to be co-managed by local stakeholders.

Corresponding Funded Project – None found

PROJECT 23: CORAL REEF ECOSYSTEM RESILIENCE ENHANCEMENT THROUGH ECOSYSTEM-BASED LANDSCAPE RESTORATION (p. 30)

This action includes establishing larval aggregation devices at coral farms to foster fish and lobster recruitment using coral from farms to restore shallow water reefs and augment recruitment of fish to non-farm areas; establish structures that will attract the common octopus and spiny lobster; and transplanting long-spined urchins to increase herbivory at farm sites.

Corresponding Funded Project – None found

PROJECT 25: COMMUNITY-BASED DESIGNATION OF CULEBRITA ISLAND NO-TAKE RESERVE (p. 32)

This action is aimed at designating a no-take natural reserve of at least 1 km around Culebrita Island to be co-managed by local stakeholders.

Corresponding Funded Project – None found

3.3 North East Reserves

PROJECT 9: ADMINISTRATIVE ORDER FOR THE CREATION OF A NO-TAKE AREA IN ADJACENT AREAS OF THE LOBOS, BLANQUILLA, AND DIABLO KEYS (p. 46)

This action is aimed at establishing a no-take area through an administrative order prohibiting commercial and recreational fishing in areas where the coral reef population has proven resilient against bleaching to further enhance the recovery characteristics of these areas. The areas would be demarcated with buoys, and education and outreach workshops, baseline characterizations, and monitoring of the areas would be conducted.

Corresponding Funded Project – None found

PROJECT 16: INVENTORY OF INVASIVE, EXOTIC, AND NATIVE SPECIES OF FISH FOR PROMOTING BEST MANAGEMENT PRACTICES AND EDUCATION (p. 49)

This action is aimed at creating internships for undergraduate university students in Puerto Rico to collect data for an up-to-date database of invasive, exotic, and native species that can be used as a reference for the management of these species, recovery actions in coral reefs, and for educational purposes.

Corresponding Funded Projects – None found

PROJECT 17: DEVELOPMENT OF A MANAGEMENT PLAN FOR THE NORTH-EAST CORRIDOR NATURAL RESERVE (NECNR) AND THE ORIGINATION OF AN ADVISORY BOARD FOR THE MANAGEMENT OF THE NECNR (p. 50)

This action aims at the development of an integrated management plan to achieve effective management through coordination between DNER, CPN, Federal Forest Service, Municipality, community, Non-Government Organizations, and the resource users.

Corresponding Funded Project – SCOPING FOR NORTHEAST CORRIDOR NATURAL RESERVE INTEGRATED MANAGEMENT PLAN – refer to previous section of the document for more details on this project.

Corresponding Funded Project – SUPPORT FOR THE EFFECTIVE MANAGEMENT OF TWO PRIORITY MPAs IN PUERTO RICO – refer to previous section of the document for more details on this project.

PROJECT 20: EDUCATIONAL VIDEO IN THE CULEBRA AND VIEQUES FERRIES RELATED TO CORAL REEF AND FISHING LAWS (p. 51)

This action is aimed at educating the general public regarding the consequences of noncompliance with established laws and regulations using methodology similar to the drunk-driving campaigns.

Corresponding Funded Project – None found

3.4 Cabo Rojo

PROJECT 14: CORAL REEF AUXILIARY INSTRUCTION PROGRAM (p. 67)

This action is aimed at training volunteers from both the community and enforcement agencies (DNER Rangers Corps) to assist with outreach and education workshops.

Corresponding Funded Project – None found

3.5 Guánica

PROJECT 12: ENABLE JOINT ENFORCEMENT AGREEMENT (p. 83)

This actions aims at establishing a Memorandum of Understanding (MOU) with State Police/FURA and Municipal Police to train personnel on fishing regulations and fish identifications in order to improve enforcement in the area.

Corresponding Funded Project – None found

PROJECT 13: CREATE OUTREACH AND EDUCATION CAMPAIGN (p. 83)

This action targets recreational fishers, commercial fishers, and the judicial system by including an analysis of economic and social impacts from non-compliance with established fishing regulations.

Corresponding Funded Project – None found

Table 2. Summary of LAS 2011-2015 Fishing Impacts Proposed Projects

LAS 2011-2015 Proposed Project Title	Priority Area	2014 Status
CAPACITY BUILDING PROGRAM FOR DNER RANGERS ON CORAL REEFS AND OTHER MARINE ECOSYSTEMS AND RELATED LAWS AND REGULATIONS	All	Although several workshops have been conducted from 2011 to 2014, more funding is needed for workshops to occur in a continuous basis in order reach a larger portion of DNER Rangers and also to refresh key information when changes to the regulations are made.
CREATE OUTREACH AND EDUCATION CAMPAIGN TO REDUCE FISHING IMPACTS ON CORAL REEF ECOSYSTEMS AIMED AT: A) RECREATIONAL FISHING COMMUNITY, B) COMMERCIAL FISHING COMMUNITY, C) BOAT OWNERS	All	Not conducted
CREATE ID CARDS WITH IMAGES OF FISH AND REEF ETIQUETTE	All	REGUALTAED MARINE SPECIES GUIDE - A new guide was developed in a ring-bound format for ease of updates by replacing pages when specific regulations change. Guides were made available by distribution during workshops for the general public, fishers, and DNER Rangers. However, only a limited amount of guides were printed and the guide does not include information on reef etiquette.

ENGAGE TOURIST SERVICE PROVIDERS, RECREATIONAL DIVERS, AND COMMERCIAL FISHERS IN THE LOCATION AND REMOVAL OF LIONFISH THROUGH TRAINING AND SPECIAL PERMITS (FISH REMOVAL IN NO-TAKE RESERVES) AND CREATE PROMOTIONAL CONSUMER CAMPAIGN TO MARKET LIONFISH TO RESTAURANTS AND FOOD-STANDS	All	LIONFISH WORKSHOPS – Permits are being offered by DNER and there have been several PSAs promoting lionfish removal. Booklets with handling and cooking instructions have been created and distributed with help from Sea Grant. LIONFISH IN A CULINARY FESTIVAL – On the week prior to the event, local newspapers, television stations, and radio networks promoted the event. The inclusion of lionfish received additional media coverage. The SOFO activity lasted 3 days and personnel from NOAA, DNER and Sea Grant oriented the general public about the biology of this invasive species. Visitors were asked to complete an attendance sheet, but the number of visitors is yet not available. This project can be considered to be completed.
DEVELOP A FORMAL COLLABORATION AGREEMENT BETWEEN DNER RANGERS AND THE POLICE (FURA) TO STRENGTHEN ENFORCEMENT OF LAWS AND REGULATIONS	Culebra	Not conducted
ARTIFICIAL CORAL REEFS AND ECOSYSTEM-BASED APPROACHES TO ENHANCE CORAL REEF RESILIENCE WITHIN THE CANAL LUIS PEÑA NO-TAKE NATURAL RESERVE, CULEBRA ISLAND, PR	Culebra	Not conducted
LONG-TERM ECOLOGICAL MONITORING IN SUPPORT OF MANAGEMENT OF THE CULEBRA ISLAND NO-TAKE MPA NETWORK	Culebra	Not conducted
COMMUNITY-BASED DESIGNATION AND MANAGEMENT OF BAHIA FLAMENCO NO-TAKE NATURAL RESERVE	Culebra	Not conducted
CORAL REEF ECOSYSTEM RESILIENCE ENHANCEMENT THROUGH ECOSYSTEM-BASED LANDSCAPE RESTORATION	Culebra	Not conducted
COMMUNITY-BASED DESIGNATION OF CULEBRITA ISLAND NO-TAKE RESERVE	Culebra	Not conducted
ADMINISTRATIVE ORDER FOR THE CREATION OF A NO-TAKE AREA IN ADJACENT AREAS OF THE LOBOS, BLANQUILLA, AND DIABLO KEYS	North East Reserves	Not conducted
INVENTORY OF INVASIVE, EXOTIC, AND NATIVE SPECIES OF FISH FOR PROMOTING BEST MANAGEMENT PRACTICES AND EDUCATION	North East Reserves	Not conducted
DEVELOPMENT OF A MANAGEMENT PLAN	North East Reserves	SCOPING FOR NORTHEAST CORRIDOR NATURAL RESERVE INTEGRATED MANAGEMENT PLAN - A draft management plan is expected to be finished by the end of 2015. SUPPORT FOR THE EFFECTIVE MANAGEMENT OF TWO PRIORITY MPAs IN PUERTO RICO - A community coordinator worked during 2 years on developing and implementing activities to engage stakeholders from the surrounding local communities in the implementation of management activities. However, there is concern that lack of continuity to follow up this effort may lead to loss of interest from the community members.
EDUCATIONAL VIDEO IN THE CULEBRA AND VIEQUES FERRIES RELATED TO CORAL REEF AND FISHING LAWS	North East Reserves	Not conducted

CORAL REEF AUXILIARY INSTRUCTION PROGRAM	Cabo Rojo	Not conducted
ENABLE JOINT ENFORCEMENT AGREEMENT	Guánica	Not conducted
CREATE OUTREACH AND EDUCATION CAMPAIGN	Guánica	Not conducted

4.0 Results and Discussion

A total of 17 projects proposed in the Puerto Rico LAS 2011-2015 document were either directly or indirectly related to fishing. A total of 20 projects related to fishing received funding from CRCP between FY11 and FY14. Only 6 of the funded projects could be directly linked to the LAS document, meaning that the title and description of the funded project closely matched to that of the LAS document (Table 2). However, some of the LAS projects cover a broad spectrum of actions that could be linked to more than one of the funded projects. On the other hand, some LAS project descriptions appear to overlap. For example, although referring to 2 different locations (Culebra and Guánica), there is redundancy between project descriptions 16 and 12, respectively. Both proposed projects seek to include local law enforcement officers in DNER Ranger training. For both proposed projects, no corresponding funded project or projects were found. Perhaps devising a uniform model of consolidating projects with the same objectives with some modifications for all locations could be used to make projects appear more feasible and attractive for implementation.

As noted previously, fishing and fisheries was not a separate theme in the recent LAS document as it was in the first LAS document. Only 20% of the projects listed in the Puerto Rico LAS 2011-2015 document addressed issues related to fishing impacts and the majority of the proposed work was for Culebra and the NER. Of the fishing or fisheries projects, 30% could be linked to recent CRCP funded Projects within the jurisdiction. However, this does not mean that funded projects addressing fishing issues which do not match the LAS document are not responding to national and jurisdictional management needs. For example, CRCP funded projects dealing directly with fishing aggregations, stock assessments, and effectiveness of current fishing management practices are still aimed at responding to both the national and jurisdictional priorities from the priority setting documents. Therefore, LAS documents should not be the only source of guidance used for assessing developments of fishing related issues, as it was developed within the blueprint of the priority setting documents.

Based on cross-referencing of CRCP funded project and fisheries-related projects in the Puerto Rico LAS 2003-2005 and discussion with local managers, it appears that the previous LAS doc served as an effective management tool. The Puerto Rico LAS 2011-2015, on the other hand, is not used to facilitate the identification of fisheries-related priority actions and is instead largely unused. In addition, reviewing the Puerto Rico LAS 2011-2015 document in order to identify projects related to fisheries and fishing impacts was not a simple task. Therefore, suggested improvements to the document include listing action-oriented strategies to facilitate project

implementation and help track and account for performance, organization of the document by the same key themes as the *Puerto Rico's Coral Reef Management Priorities* document and further clarification of the project's goals. Based on conversations with local managers, some prefer to have broad goals because it is easy to outgrow targeted programs. However, it would be useful to break down the currently proposed fisheries-related projects within the Puerto Rico LAS 2011-2015 into achievable projects with focused goals in order to complete targeted actions under the identified priorities.

Although it is still too early to appropriately evaluate the effectiveness of the Puerto Rico LAS 2011-2015 document strategy and implementation for fishing related projects, it remains clear that the sustainable management of our coral reefs inevitably includes people and consequently public education and outreach are an obligate part of the solution. Not surprisingly, continued education for fishers and enforcers continues to be a priority of the latest LAS proposed actions. Although very few of the recently funded actions specifically address this issue, many of the work that has been done in the past (Appendix B) still contains relevant information that can potentially be used for creating an educational plan for fishers and DNER Rangers. It is critical to focus on education as the common ground among the many factors involved in the conservation of coral reef ecosystems and utilizing existing resources for creating a reference point for education and outreach initiatives is critical for achieving overall project success.

5.0 References

1. Padilla, G. *Puerto Rico Local Action Strategy Projects for Coral Reef Conservation: Overfishing (2003-2010)*. NOAA NMFS Caribbean Field Office, PR, 19 pp.
2. Puerto Rico Department of Natural and Environmental Resources, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, and Universidad Metropolitana. 2013. *Local Action Strategies (LAS) for Coral Reef Conservation 2011-2015 Puerto Rico*. Silver Spring, MD: NOAA, 54pp.
3. Puerto Rico Department of Natural and Environmental Resources and the U.S. Department of Commerce, National Oceanic and Atmospheric Administration. 2005. *Puerto Rico Report on Local Action Strategies to Protect Coral Reefs*. Silver Spring, MD: NOAA, 61pp.
4. The Commonwealth of Puerto Rico and NOAA Coral Reef Conservation Program. 2010. *Puerto Rico's Coral Reef Management Priorities*. Silver Spring, MD: NOAA, 37 pp.
5. U.S. Department of commerce, National Oceanic and Atmospheric Administration 2010 *Coral Reef Conservation Program Goals and Objectives 2010-2015*. Silver Spring, MD: NOAA, 40 pp.
6. U.S. Department of commerce, National Oceanic and Atmospheric Administration 2000 *The National Action Plan to Conserve Coral Reefs*. Silver Spring, MD: NOAA, 41pp.

Appendix B – Summary of the topics covered in the presentations given during workshops conducted from 2002 to 2009.

Presentation	Workshop	Dates	Author	Description
Tramites de un Caso Referido a la Oficina de Asuntos Legales del DRNA	Federal and Commonwealth of PR Fisheries Laws and Regulations	March 9,10,12,17, 2009; August 18, 20, 2009	Lcdo. Hiram Zayas, DRNA Legal Affairs Division	Examples on how to perform an intervention and correctly complete a formal report highlighting the importance of presenting photographic evidence and what steps to follow once the report has been submitted.
Tramites de un Caso Referido a la Oficina de Oficiales Examinadores del DRNA	Federal and Commonwealth of PR Fisheries Laws and Regulations	March 9,10,12,17, 2009; August 18, 20, 2009	Lcdo. Jose M. Tous, DRNA Legal Affairs Division	Explanation of the Law for Standard Administrative Procedures and the Regulations for Administrative Procedures of the DNER. It was noted that the Fishing Law has no criminal dispositions unless a poisonous substance are released to the water.
Processing of Federal Cases	Federal and Commonwealth of PR Fisheries Laws and Regulations	March 9,10,12,17, 2009; August 18, 20, 2009	Lcdo. Duane Smith, NOAA Fisheries General Counsel	Explanation of the similarities between federal and local processing of cases highlighting the importance of correct identification of the infraction and proper gathering of evidence.
Preparation of Federal Cases: US Army Corps of Engineers Jurisdiction over Wetland Areas the Necessary Information for Legally Processing Potential Violations	Puerto Rico Costal Wetlands	August 18, 20, 2009	Carmen G. Roman and Edgar Garcia, US Army Corps of Engineers	Explanation of Federal laws protecting wetlands and key information for investigating unauthorized activities in wetland areas.
Puerto Rico Fish and Wildlife (Law 241)	Puerto Rico Costal Wetlands	August 18, 20, 2009	Jose Chavert, DNER Special Service Bureau	Definition of Law 241 and how it declares the protection of wildlife and their natural habitat as part of the general public policy of the Government of Puerto Rico.
Human Activities Affecting Wetlands and Applicable Local Laws	Puerto Rico Costal Wetlands	August 18, 20, 2009	Lcdo. Juan M. Cordero, DNER Legal Affairs Division	Explanation of DNER jurisdiction over wetland areas and the local laws and regulations that apply in case there is a potential violation
Regulations Biology for Law Enforcement Officers in Puerto Rico	Support for Coral Reef and Fisheries Enforcement in Puerto Rico	October 16,18, 2007	Dr. Lisamarie Carrubba, NMFS	Formal presentation of a new Regulated Species Guide for law enforcement officers.
The Importance of Taxonomic Identification of Regulated Species for the Application of Laws and Regulations	Support for Coral Reef and Fisheries Enforcement in Puerto Rico	April 6-7, 2006	Dr. Edwin A. Hernandez, UPR	Definition of basic concepts for taxonomic identification and their importance in the application of laws and regulations.
Identification of Marine Organisms Permitted to be Captured and Exported for the Aquarium Trade Industry	Support for Coral Reef and Fisheries Enforcement in Puerto Rico	April 6-7, 2006	Dr. Edwin A. Hernandez, UPR	Enhance taxonomic identification of permitted aquarium trade species.
Identification of Regulated Coral Species: Coral Reef Law 147	Support for Coral Reef and Fisheries Enforcement in Puerto Rico	April 6-7, 2006	Dr. Edwin A. Hernandez, UPR	Enhance taxonomic identification of regulated coral species

Taking Fish Measurements	Support for Coral Reef and Fisheries Enforcement in Puerto Rico	April 6-7, 2006	Zulena Cortez, Kelvin Serrano and Maria del Mar Lopez	Explanation of how to properly measure regulated fish species
Puerto Rico Coral Reef Law	Support for Coral Reef and Fisheries Enforcement in Puerto Rico	April 6-7, 2006	Aida Rosario, DRNA Laboratorio de Investigaciones Pesqueras	Definition of key factor in the distribution and protection of coral reefs around Puerto Rico.
Puerto Rico Fishing Regulation	Support for Coral Reef and Fisheries Enforcement in Puerto Rico	April 6-7, 2006	Aitza Pabon, NMFS	Explanation of local fishing laws and regulations and how they apply to commercial and recreational fishermen.
Regulated Fish Guide: Law 278/Regulation 6768	Support for Coral Reef and Fisheries Enforcement in Puerto Rico	April 6-7, 2006	Eileen Alicea, NOAA-CRCP	Images of regulated fish species with their differentiating characteristics and the applicable commercial and recreational regulations.
Identification of Corals and other Protected Marine Invertebrates in Puerto Rico	Law Enforcement for Marine Species	June 7, 2006; September 5, 2006	Juan L. Torres, NMFS	Explanation of the differentiating characteristics of coral and other regulated invertebrates and how to distinguish between rock and dead corals.
Contamination and Impacts of Fishing Gear on Coral Reefs	FY04 Workshops for Fishermen and Marinas	November 3-6, 2004; December 9,15,16; 2004; January 11-14, 19-21, 27-28; 2005	Juan L. Torres and Aitza Pabon, NMFS	Explanation of short and long term effects from the use of certain types of fishing gear on coral reefs. Community based coral reef conservation activities.
Coral Reefs: Biology and Importance	FY04 Workshops for Fishermen and Marinas	November 3-6, 2004; December 9,15,16; 2004; January 11-14, 19-21, 27-28; 2005	Juan L. Torres and Aitza Pabon, NMFS	Images of coral reefs from around Puerto Rico
Recreational Marine Fisheries Statistics	FY04 Workshops for Fishermen and Marinas	November 3-6, 2004; December 9,15,16; 2004; January 11-14, 19-21, 27-28; 2005	Juan L. Torres and Aitza Pabon, NMFS	Provided recreational fisheries data as the basis for proposing a project for promoting sustainable fishing practices in order to protect and restore this valuable resource.
Fisheries Statistics	FY04 Workshops for Fishermen and Marinas	November 3-6, 2004; December 9,15,16; 2004; January 11-14, 19-21, 27-28; 2005	Juan L. Torres and Aitza Pabon, NMFS	Explanation on how to correctly fill out the commercial fishing ballot
Commercial Harvest of Highly Migratory Species	FY04 Workshops for Fishermen and Marinas	November 3-6, 2004; December 9,15,16; 2004; January 11-14, 19-21, 27-28; 2005	Juan L. Torres and Aitza Pabon, NMFS	Historical background on the management of HMS followed by a list of species and the regulations that apply to each with respect to commercial and recreational fishers.
Importance of Fisheries Statistics from a Scientific Perspective	FY04 Workshops for Fishermen and Marinas	November 3-6, 2004; December 9,15,16; 2004; January 11-14, 19-21, 27-28; 2005	Dr. Edgardo Ojeda, UPR Sea Grant Program	Explanation of the rationale behind the different types of fisheries statistics, the most common errors found in reports and how they affect their outcome
Regulated Species under the Puerto Rico Fishing Law	FY04 Workshops for Fishermen and Marinas	November 3-6, 2004; December 9,15,16; 2004; January 11-14, 19-21, 27-28; 2005	Juan L. Torres, NMFS	Photos of the regulated species in Puerto Rico

Aquarium Trade Organisms	FY04 Workshops for Fishermen and Marinas	November 3-6, 2004; December 9,15,16; 2004; January 11-14, 19-21, 27-28; 2005	Juan L. Torres and Aitza Pabon, NMFS	Photos of the organisms
Puerto Rico Fishing Regulation	FY04 Workshops for Fishermen and Marinas	November 3-6, 2004; December 9,15,16; 2004; January 11-14, 19-21, 27-28; 2005	Aida Rosario, DRNA Laboratorio de Investigaciones Pesqueras	
Puerto Rico Fishing Laws	Workshop for DNER Ranger Corps	October 28-31, 2003; November 4-7, 2003; November 20-21, 2003	Aida Rosario, DRNA Laboratorio de Investigaciones Pesqueras	Explanation of laws for minimizing fishing impacts on coral reefs
Coral Reefs: Biology and Importance	Workshop for DNER Ranger Corps	October 28-31, 2003; November 4-7, 2003; November 20-21, 2003	Carlos Pacheco (DRNA) and Aitza Pabon (NMFS)	Definition of what is a coral reef, different types of coral reefs, organisms associated to coral reefs, and the different factors that affect coral reefs
Fishing PR: FY02	Workshop of the Fishers of Puerto Rico	November 2, 23, 2002; December 14, 2002	Dr. Lisamarie Carruba	Explanation of NMFS Habitat Conservation responsibilities and projects in Puerto Rico