

Comprehensive Amendment to the U.S. Caribbean Fishery Management Plans



Annual Catch Limit Control Rule

Public Hearing Draft



Including Draft Environmental Assessment
May 2014



Comprehensive Amendment to the U.S. Caribbean Fishery Management Plans: Annual Catch Limit Control Rule

Amendment 7 to the Fishery Management Plan for the Reef Fish Fishery of Puerto Rico and the U.S. Virgin Islands

Amendment 6 to the Fishery Management Plan for the Spiny Lobster of Puerto Rico and the U.S. Virgin Islands

Amendment 5 to the Fishery Management Plan for the Corals and Reef Associated Plants and Invertebrates of Puerto Rico and the U.S. Virgin Islands

Amendment 4 to the Fishery Management Plan for the Queen Conch Resources of Puerto Rico and the U.S. Virgin Islands

Proposed action:

Adjust the buffer applied to the overfishing limit or to the acceptable biological catch, to derive the annual catch limit of Caribbean Fishery Management Council species to reflect changes in the overfishing status.

**Responsible agencies and
Contact Persons:**

Caribbean Fishery Management Council
270 Muñoz Rivera Ave., Suite 401
San Juan, Puerto Rico 00918-1903
(787) 766-5926
Contact: Miguel A. Rolón,
miguel_rolon_cfmc@yahoo.com

National Marine Fisheries Service,
Southeast Region
263 13th Avenue South
St. Petersburg, FL 33701
(727) 824-5305
Contacts:
Phil Steele, Phil.Steele@noaa.gov
María del Mar López,
Maria.Lopez@noaa.gov

Abbreviations and Acronyms Used

ABC	allowable biological catch	MMPA	Marine Mammal Protection Act
ACL	annual catch limit	MPA	marine protected area
APA	Administrative Procedures Act	MSY	maximum sustainable yield
CEA	cumulative effects assessment	NEPA	National Environmental Policy Act
CEQ	Council on Environmental Quality	NMFS	National Marine Fisheries Service
CFMC	Caribbean Fishery Management Council; Council	NOAA	National Oceanic and Atmospheric Administration
CZMA	Coastal Zone Management Act	OFL	overfishing limit
DNER	Department of Natural and Environmental Resources of Puerto Rico	OMB	Office of Management and Budget
DPNR	Department of Planning and Natural Resources of the USVI	OY	optimum yield
EA	environmental assessment	PRA	Paperwork Reduction Act
EEZ	exclusive economic zone	RFA	Regulatory Flexibility Act
EFH	essential fish habitat	RIR	Regulatory Impact Review
ESA	Endangered Species Act	SSC	Scientific and Statistical Committee
FEIS	final environmental impact statement	SFA	Sustainable Fisheries Act
FMP	fishery management plan	SEFSC	Southeast Fisheries Science Center
FMU	fishery management unit	SERO	Southeast Regional Office
GU	Grouper Unit	SU	Snapper Unit
HAPC	habitat area of particular concern	USVI	United States Virgin Islands

Magnuson-Stevens Act

Magnuson-Stevens Fishery Conservation and Management Act

Table of Contents

Abbreviations and Acronyms Used	III
List of Tables	VI
List of Figures	IX
Table of Contents for the Environmental Assessment.....	X
Chapter 1. Introduction	1
1.1 What Actions are Being Proposed?	1
1.2 Who is Proposing the Action?	2
1.3 Where is the Project Located?	2
1.4 Why is the Council Considering Action?	3
Purpose for Action	5
Need for Action.....	5
1.5 Management History.....	6
1.5.1 Management History Relative to Management Reference Points, Stock Status, and Annual Catch Limits	6
1.5.2 Recent Council Actions	7
1.6 Current Management Reference Points or Proxies for Council Managed Species	9
Chapter 2. Proposed Action and Alternatives.....	18
2.1 What is the Proposed Action?.....	18
2.2 List of Alternatives	18
(Cont.) 2.2 List of Alternatives	19
2.2.1 Discussion of the Alternatives	19
2.2.1.1 Analyses on the Effects of the Proposed Alternatives	24
2.2.2 Current Status of Stocks and Changes to Current Annual Catch Limits Proposed by the Annual Catch Limit Control Rule.....	47
2.2.3 Annual Process that Would be Used to Apply the Annual Catch Limit Control Rule under Alternative 2 or Preferred Alternative 3	49
Chapter 3. Affected Environment	50
3.1 Physical/ Habitat Environment	51
3.2 Biological and Ecological Environment	55

3.2.1 Description of the Species: Biology/Ecology	55
3.2.2 Overview of Status Determinations for Stocks (Overfished, Overfishing, and Unknown Status).....	57
3.2.2.1 Status of the Stocks: Southeast Data Assessment and Review (SEDAR) and NMFS Status of U.S. Fisheries Annual Report to Congress	59
3.2.3 Protected Species	65
3.3 Description of the Fisheries	70
3.4 Economic and Social Environment.....	72
3.4.1 Economic Environment	72
3.4.1.1 Economic Description of the Puerto Rico and U.S. Virgin Islands Commercial and Recreational Fishing Industries	72
3.4.2 Description of the Social and Cultural Environment.....	92
3.4.3. Environmental Justice Considerations.....	103
3.5 Administrative Environment.....	106
3.5.1 Federal Fishery Management.....	106
3.5.2 Territory and Commonwealth Fishery Management.....	107
Chapter 4. Environmental Effects.....	110
4.1 Management Measures for the Proposed Action: Annual Catch Limit Control Rule	110
4.1.1 Direct and Indirect Effects on the Physical Environment.....	110
4.1.2 Direct and Indirect Effects on the Biological and Ecological Environment.....	115
4.1.3 Direct and Indirect Effects on the Economic Environment	122
4.1.4 Direct and Indirect Effects on the Social Environment	131
4.1.5 Direct and Indirect Effects on the Administrative Environment	138
4.2 Cumulative Effects Assessment.....	141
Chapter 5. List of Preparers	151
Chapter 6. List of Agencies, Organizations and Persons Consulted.....	152
Chapter 7. References	153
Appendices.....	163
Appendix A. Other Applicable Law	163
Appendix B. Summary of Regulations in Federal, U.S. Virgin Islands, and Puerto Rico Waters.	172

List of Tables

Table 1.6.1. Overfishing limits for stocks addressed in the 2010 Caribbean ACL Amendment.	11
Table 1.6.2. Overfishing limits for stocks addressed in the 2011 Caribbean ACL Amendment.	14
Table 1.6.3. Management reference points or proxies for all Council managed species	16
Table 2.2.1.1.1. Puerto Rico commercial and recreational landings in pounds (lbs) for the most recent years (2008-2011 Commercial sector, 2008-2012 Recreational sector) and individual OFLs and Caribbean-Wide OFL for 2010 stocks.	25
Table 2.2.1.1.2. St. Croix and St. Thomas/St. John commercial landings in pounds (lbs) for the most recent five years (2008-2012) and Caribbean-Wide OFL for 2010 stocks.....	25
Table 2.2.1.1.3. Puerto Rico commercial and recreational landings in pounds (lbs) for the most recent years of available information (2008-2011 Commercial sector, 2008-2012 Recreational sector) and Caribbean-Wide OFL for 2011 stocks.	26
Table 2.2.1.1.4. St. Croix and St. Thomas/St. John commercial landings in pounds (lbs) for the most recent five years of available information (2008-2012) and individual OFLs for 2011 stocks.....	27
Table 2.2.1.1.5. Caribbean-wide landings for the most recent five years of available information for the tilefish and aquarium trade species FMUs and corresponding Caribbean-wide OFL.	27
Table 2.2.1.1.6. Units from 2010 and 2011 stocks that exceeded their OFLs based on annual landings for the past 5 years (2008 to 2012).....	28
Table 2.2.1.1.7. Current ACLs (Alternative 1) and new ACLs for 2010 stocks per island/island region and sector under Alternative 2 and Alternative 3 (including Sub-alternatives 3a-3e) if stocks are determined to be ‘subject to overfishing’.	29
Table 2.2.1.1.8. Current ACLs (Alternative 1) and new ACLs for 2011 stocks per island/island region and sector under Alternative 2 and Alternative 3 (including Sub-alternatives 3a-3e) if stocks are determined to be ‘subject to overfishing’.	31
Table 2.2.1.1.9. Current ACLs (Alternative 1) and new ACLs for 2010 stocks per island and sector under Alternative 2 and Alternative 3 (including Sub-alternatives 3a-3e) if stocks are determined not to be subject to overfishing.....	34
Table 2.2.1.1.10. Current ACLs (Alternative 1) and new ACLs for 2011 stocks per island and sector under Alternative 2 and Alternative 3 (including Sub-alternatives 3a-3e) if stocks are determined to be ‘not subject to overfishing’.	36
Table 2.2.1.1.11. Stocks addressed in the 2010 Caribbean ACL Amendment (2010 stocks) that exceeded their ACL under Alternative 1 and the number of pounds over the ACL	39

Table 2.2.1.1.12. Stocks addressed in the 2011 Caribbean ACL Amendment (2011 stocks) that exceeded their ACL under Alternative 1 and the number of pounds over the ACL	39
Table 2.2.1.1.13. Stocks addressed in the 2010 Caribbean ACL Amendment (2010 stocks) that exceeded their ACL in Alternative 2 under a ‘subject to overfishing’ status scenario and the pounds over the ACL.....	41
Table 2.2.1.1.14. Stocks addressed in the 2011 Caribbean ACL Amendment (2011 stocks) that exceeded their ACLs in Alternative 2 under a ‘subject to overfishing’ status scenario and the number of pounds over the ACL.	41
Table 2.2.1.1.15. Stocks addressed in the 2010 Caribbean ACL Amendment (2010 stocks) that exceeded their ACLs in Alternative 2 under a ‘not subject to overfishing’ status scenario and the number of pounds over the ACL.	44
Table 2.2.1.1.16. Stocks addressed in the 2011 Caribbean ACL Amendment that exceeded their ACLs in Alternative 2 under a ‘not subject to overfishing’ status scenario and the number of pounds over the ACL.....	44
Table 3.2.1.1. Species included in the Reef Fish, Coral, Spiny Lobster, and Queen Conch FMPs.	55
Table 3.2.2.1. Comparison of ‘subject to overfishing’ stock status classification for all U.S. Caribbean managed FMUs among the NMFS Status of U.S. Fisheries 2011 Report, the NMFS Status of U.S. Fisheries 2012 Report, and the 2013 4 th Quarter update report of the NMFS Status of U.S. Fisheries.....	62
Table 3.2.2.2. Comparison of ‘overfished’ stock status classification for Council managed stocks/stocks complexes among the NMFS Status of U.S. Fisheries 2011 Report, NMFS Status of U.S. Fisheries 2012 Annual Report, and the 4 th Quarter 2013 NMFS Status of U.S. Fisheries Report.....	64
Table 3.4.1.1.1. Annual Number of Commercial Trips, Landings, and Ex-Vessel Revenue for Puerto Rico, 2008-2011.	73
Table 3.4.1.1.2. Monthly Number of Commercial Trips for Puerto Rico, 2008-2011.....	73
Table 3.4.1.1.3. Number of Commercial Trips by Species Group/Complex for Puerto Rico, 2008-2011.	74
Table 3.4.1.1.4. Annual Commercial Landings by Species Group/Complex for Puerto Rico, 2008-2011.	75
Table 3.4.1.1.5. Annual Commercial Ex-Vessel Revenue by Species Group/Complex for Puerto Rico, 2008-2011.....	76
Table 3.4.1.1.6. Monthly Commercial Landings (whole pounds) for Puerto Rico, 2008-2011..	76
Table 3.4.1.1.7. Monthly Commercial Ex-Vessel Revenue for Puerto Rico (nominal weighted U.S. dollars), 2008-2011.....	77

Table 3.4.1.1.8. Annual Commercial Landings (whole pounds) by Gear Type for Puerto Rico, 2008-2011.....	78
Table 3.4.1.1.9. Annual Commercial Ex-Vessel Revenue (nominal U.S. dollars) by Gear Type for Puerto Rico, 2008-2011.....	79
Table 3.4.1.1.10. Number of Commercial Trips Reporting Landings by Species Group/Complex in St. Thomas/St. John, 2008-2012.....	80
Table 3.4.1.1.11. Annual Commercial Landings (whole pounds) by Species Group/Complex in St. Thomas/St. John, 2008-1012.....	81
Table 3.4.1.1.12. Annual Commercial Revenue (nominal U.S. dollars) by Species Group/Complex in St. Thomas/St. John, 2008-2012.....	82
Table 3.4.1.1.13. Annual Number of Commercial Vessels Landing Various Ranges of Pounds in St. Thomas/St. John, 2008-2012.....	83
Table 3.4.1.1.14. Annual Commercial Landings (whole pounds) by Gear Type in St. Thomas/St. John, 2008-2012.....	83
Table 3.4.1.1.15. Annual Commercial Ex-Vessel Revenue (nominal U.S. dollars) by Gear Type in St. Thomas/St. John, 2008-2012.....	84
Table 3.4.1.1.16. Annual Number of Commercial Trips Reporting Landings for Each Species Group/Complex in St. Croix, 2008-2012.....	85
Table 3.4.1.1.17. Annual Commercial Landings (whole pounds) by Species Group/Complex in St. Croix, 2008-2012.....	86
Table 3.4.1.1.18. Annual Commercial Ex-Vessel Revenue (nominal) by Species Group/Complex in St. Croix, 2008-2012.....	87
Table 3.4.1.1.19. Annual Number of Commercial Vessels Landing Various Pound Ranges in St. Croix, 2008-2012.....	88
Table 3.4.1.1.20. Annual Commercial Landings (whole pounds) by Gear Type in St. Croix, 2008-2012.....	88
Table 3.4.1.1.21. Annual Commercial Ex-Vessel Revenue (nominal U.S. dollars) by Gear Type in St. Croix, 2008-2012.....	89
Table 3.4.1.1.22. Total Recreationally Harvested and Released Numbers of Fish in Puerto Rico, 2008-2012.....	90
Table 3.4.1.1.23. Total Recreational Angler Trips in Puerto Rico, 2008-2012.....	91
Table 3.4.1.1.24. Total Recreational Angler Trips by Mode in Puerto Rico, 2008-2012.....	91
Table 3.4.1.1.25. Recreational Participation by Region (individuals) in Puerto Rico, 2008-2012.....	91
Table 3.4.2.1. Target species by coastal region.....	95

Table 3.4.2.2. Three most important species by municipality, 1999-2003.....	95
Table 3.4.2.3. Relative importance of categories of fish, mollusks, and crustaceans to St. Croix interviewed licensed commercial fishers	99
Table 3.4.2.4. Relative importance of categories of fish, mollusks, and crustaceans to St. Thomas/St. John interviewed licensed commercial fishers	102
Table 3.4.3.1. Puerto Rico communities which exceeded poverty threshold for year 2010	104
Table 3.4.3.2. U.S. Virgin Islands communities which exceeded poverty threshold for year 2010.	105
Table 4.1.2. Summary of Physical, Biological, and Ecological Effects from Alternative 1 , Alternative 2 , and Alternative 3	121
Table 4.1.3.1. Maximum potential change in annual commercial ex-vessel revenue and the direction of economic effects for the recreational and subsistence sectors under Alternative 2 , Alternative 3 , and Sub-alternatives 3a-3e assuming the ‘subject to overfishing status’ scenario	124
Table 4.1.3.2. Maximum potential annual change in commercial ex-vessel revenue and the direction of economic effects for the recreational and subsistence sectors under Alternative 2 , Alternative 3 , and Sub-alternatives 3a-3e assuming the ‘not subject to overfishing’ status scenario	127
Table 4.1.2. Cause and Effect Relationships within the time period of the CEA.....	148

List of Figures

Figure 1.3.1. Jurisdictional boundaries of the Caribbean Fishery Management Council.....	2
Figure 3.1.1. Boundaries of the U.S. Caribbean EEZ, Puerto Rico waters, and USVI waters....	51
Figure 3.1.2. Shared platform between the east coast of Puerto Rico and St. Thomas/St. John.	53
Figure 3.2.3.1 A. Designated Critical Habitat Areas 2 and 3 for Elkhorn and Staghorn Corals.	68
Figure 3.2.3.1 B. Designated Critical Habitat Area 4 for Elkhorn and Staghorn Corals.....	69
Figure 3.4.2.1. Map of Puerto Rico with census designated places.....	93
Figure 3.4.2.2. Map of St. Croix with census designated places.	98
Figure 3.4.2.3. Map of St. Thomas and St. John with census designated places.....	101

Table of Contents for the Environmental Assessment

Purpose and Need	5
Alternatives	18
Affected Environment.....	50
Environmental Effects	110
List of Preparers	151
List of Agencies and Persons Consulted.....	152

DRAFT

Chapter 1. Introduction

1.1 What Actions are Being Proposed?

Fishery managers propose an action to adjust the current buffer reduction applied to the overfishing limit (OFL), or to the acceptable biological catch (ABC), to derive the annual catch limit (ACL) for species managed by the Caribbean Fishery Management Council (Council) in Puerto Rico, St. Croix, and St. Thomas/St. John. The buffer reduction proposed to be applied to any of these management reference points would depend on the overfishing status of each Fishery Management Unit (FMU) as determined by the National Marine Fisheries Service (NMFS).

The 2010 Caribbean ACL Amendment (CFMC 2011a) and the 2011 Caribbean ACL Amendment (2011b) established ACLs for all species managed by the Council. Annual catch limits for managed stocks or stock complexes (i.e., multiple species are grouped into stock complexes) were derived from buffer reductions to the OFLs or ABCs to account for scientific and management uncertainty. The Council considered the overfishing status of stocks at the time of preparation of these amendments when determining how much uncertainty (percent reduction) should be applied to the OFL or the ABC (if specified) to derive the ACL for each FMU and sector within the Unit.



Since the completion of these amendments, the overfishing status of several of these FMUs has changed, and it is anticipated that future changes in overfishing status will occur.

The Council requested that when the overfishing status of an FMU changes, the buffer reduction should be changed accordingly. The action considered in this amendment would provide for a process that would implement ACL revisions in response to changes in overfishing status. This action would allow the Council and NMFS to expedite the process of adjusting the ACLs rather than doing it on a case by case basis, and to be more responsive to changing situations.

This action would amend the U.S. Caribbean Fishery Management Plans (FMPs) for the Reef Fish Resources, Corals and Reef Associated Plants and Invertebrates, Spiny Lobster, and Queen Conch.



1.2 Who is Proposing the Action?

The Caribbean Fishery Management Council is proposing the action. The Council develops the plan amendments and submits them to NMFS who ultimately approves, disapproves, or partially approves the actions in the amendment on behalf of the Secretary of Commerce, and implements the regulations.

Caribbean Fishery Management Council

- Responsible for conservation and management of U.S. Caribbean fish stocks.
- Consists of seven voting members:
 - Four voting members appointed by the Secretary of Commerce
 - One voting member appointed by each of the Governors of Puerto Rico and the U.S. Virgin Islands
 - The Regional Administrator of NMFS for the Southeast Region
- Manages the area from 3 to 200 nautical miles (nm) off the coasts of the U.S. Virgin Islands, and 9 to 200 nm off the coast of Puerto Rico.
- Develops fishery management plans and recommends regulations to NMFS and the Secretary of Commerce for implementation.

1.3 Where is the Project Located?

Fishery resources in federal waters of the U.S. Caribbean are managed by the Council under four extant FMPs: Reef Fish, Queen Conch, Spiny Lobster, and Coral. Federal waters in the U.S. Caribbean are located in the 3 - 200 nautical mile (nm) (6 - 370 kilometers (km)) U.S. exclusive economic zone (EEZ) off the USVI, and in the 9 - 200 nm (17 - 370 km) EEZ off the Commonwealth of Puerto Rico (Fig. 1.3.1).

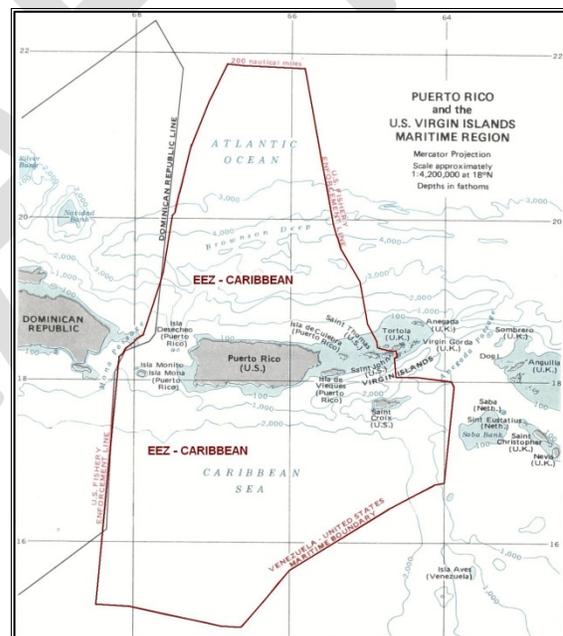
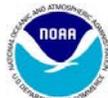


Figure 1.3.1. Jurisdictional boundaries of the Caribbean Fishery Management Council.



1.4 Why is the Council Considering Action?

The 2010 Caribbean ACL Amendment, implemented in 2012 (FR 76 82404), established management reference points and ACLs for the snapper, grouper, parrotfish, and queen conch FMUs (i.e., 2010 stocks). At the time of preparation of the 2010 Caribbean ACL Amendment, some of the species in these FMUs were determined to be ‘subject to overfishing’ (NMFS 2011 Annual Report to Congress on the Status of U.S. Fisheries, http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/archive/2011/2011_sos_report.pdf [NMFS 2012]). That overfishing status was a consideration in applying a 15% reduction to the OFL or the ABC to derive the corresponding ACL for most of the units and sectors within the units.

Annual catch limits for the remainder of the federally managed species in the U.S. Caribbean were established in the 2011 Caribbean ACL Amendment, which was also implemented in 2012 (FR 76 82414). For the majority of the FMUs addressed in the 2011 Caribbean ACL Amendment (i.e., 2011 stocks), the ACL for each FMU and sector within the unit was determined based on a 10% reduction to the OFL or ABC that responded, in part, to their current status as ‘not subject to overfishing’ (NMFS 2012).

In both amendments, the Council also specified other buffers (different than 10 or 15%) to the OFL or ABC to derive the ACLs for units such as parrotfish, queen conch, surgeonfish, angelfish, and aquarium

trade species. These buffers were not solely based on overfishing status. Buffers were based on factors including the ecological importance of the species (species that perform an essential ecological function [e.g., herbivores such as parrotfish which help maintain the algal population in optimal balance]), management under a partial harvest prohibition, or uncertainty in harvest patterns, for example.

Since the completion of these amendments, the status of several of these FMUs has changed, and it is anticipated that future changes in overfishing status will occur. In particular, most of the species previously determined to be ‘subject to overfishing’ are currently no longer classified as so, although the 15% reduction continues to be applied. As such, fishers may be getting penalized because they cannot harvest the true OFL, resulting in unnecessary economic loss.

To respond to this situation, the Council requested a modification to the regulations to ensure that, when the overfishing status of a stock changes, the buffer reduction applied to the appropriate management reference point to determine the ACL should be changed accordingly.

Annual Catch Limit Control Rule

This comprehensive amendment proposes to establish an “Annual Catch Limit Control Rule” to modify the buffer reduction applied to the OFL or ABC (if specified) to derive an ACL, to reflect a change in classification of the FMU. If implemented, the ACL Control Rule would apply a pre-determined buffer reduction based on the current status of the FMU as determined by NMFS.

Establishing this mechanism would 1) provide a **new, straightforward**, and more **responsive** approach to considering reductions from reference points to account for attributes of the fishery, and 2) would also **simplify** the process of adjusting the ACLs if the status of an FMU changes, rather than making such adjustments on a case by case basis, through a lengthier plan amendment process.

A **Control Rule** is a policy for establishing a limit or target fishing level that is based on the best available scientific information and is established by fishery managers in consultation with fishery scientists. Control rules should be designed so that management actions become more conservative as biomass estimates, or other proxies, for a stock or stock complex decline and as science and management uncertainty increases.

(Source: 50 CFR 600.310 - National Standard 1—Optimum Yield)

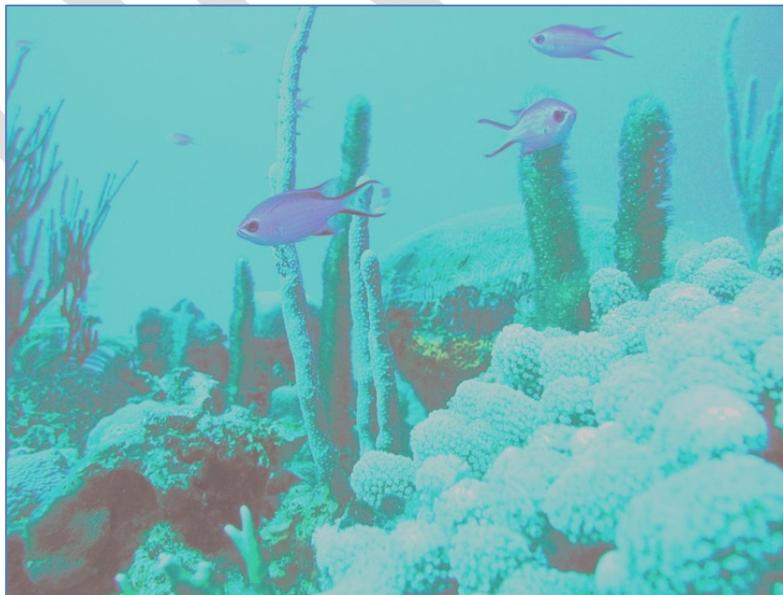


Photo credit: NOAA NCCOS/UNCW – T. Battista

Purpose for Action

The purpose of this action is to establish a control rule to modify the buffer reduction that is applied to the overfishing limit (OFL) or the acceptable biological catch (ABC) to derive an annual catch limit (ACL) in response to changes in the overfishing status of any U.S. Caribbean fishery management unit (FMU). The control rule would apply a specific buffer reduction based on the current status of the FMU as determined by the National Marine Fisheries Service (NMFS). Establishing this control rule would provide the Caribbean Fishery Management Council (Council) and NMFS the flexibility to respond quickly to changes in the fishery.

Need for Action

There is a need to establish a mechanism that describes the relationship between overfishing status and the reduction buffer applied to the OFL (or ABC) used to determine the ACL. The proposed mechanism would adjust the buffer reduction as appropriate to reflect a change in classification of the FMUs. This amendment will provide for a new and straightforward process that will allow for ACL revisions based on OFL status. This process will be examined annually in terms of the overfishing determination.

The ACL for most FMUs in the 2010 Caribbean ACL Amendment was determined based on a 15% reduction to the OFL or the ABC. This buffer was applied as a precautionary approach reflecting both the combined management and scientific uncertainty inherent in the data, and the many changes that have taken place in the management of Caribbean FMUs since 2005. At the time, some of the species in the FMUs were classified as ‘subject to overfishing’, and that overfishing status was a consideration in applying the 15% reduction. In contrast, for the FMUs included in the 2011 Caribbean ACL Amendment, the ACL was determined based on a 10% reduction to the assigned reference point (OFL or ABC) that responded (in part) to their status as not subject to overfishing. Since the completion of these amendments, the status of several of these FMUs has changed, and it is anticipated that future changes in overfishing status will occur. The Council requested that when the status of a FMU changes, the buffer reduction should be changed accordingly.

1.5 Management History

1.5.1 Management History Relative to Management Reference Points, Stock Status, and Annual Catch Limits

The history of federal management until 2011 for managed species in the U.S. Caribbean Reef Fish, Queen Conch, Coral, and Spiny Lobster FMPs can be found in the 2010 and 2011 Caribbean ACL Amendments (CFMC 2011a, b) and is incorporated herein by reference. These amendments were implemented in 2012. The Caribbean Council's actions that pertain to the discussion of reference points, stock status, and ACLs are summarized below.

2005 Caribbean Sustainable Fisheries Act (SFA) Amendment (CFMC 2005)

The Comprehensive Amendment to the FMPs of the U.S. Caribbean to address required provisions of the Magnuson-Stevens Fishery Conservation and Management Act (2005 Caribbean SFA Amendment) included a supplemental environmental impact statement (SEIS), regulatory impact review (RIR), and regulatory flexibility analysis (RFA) (CFMC 2005). Regulations were implemented in November 2005 (70 FR 62073). The amendment accomplished the following:

- Redefined the FMUs for the four FMPs;
- Established seasonal closures;
- Imposed gear restrictions and requirements;
- Established biological reference points and stock status criteria;

- Established rebuilding schedules and strategies to end overfishing and rebuild overfished stocks. The amendment established rebuilding plans for overfished units: grouper unit (GU)1, GU2, GU4, and queen conch;
- Designated essential fish habitat (EFH) and habitat areas of particular concern (HAPCs); and minimized adverse impacts on such habitat to the extent practicable.

2010 Caribbean ACL Amendment (CFMC 2011a)

Amendment 2 to the FMP for the Queen Conch Fishery of Puerto Rico and the U.S. Virgin Islands and Amendment 5 to the Reef Fish FMP of Puerto Rico and the U.S. Virgin Islands (2010 Caribbean ACL Amendment), including EIS, RIR, and RFA (CFMC 2011a) became effective on January 30, 2012 (76 FR 82404) and accomplished the following:

- Amended the unit composition in the Reef Fish FMUs;
- Revised management reference points (maximum sustainable yield, optimum yield, OFL, ABC) for snapper, grouper, parrotfish, and queen conch in the U.S. Caribbean;
- Established island-specific ACLs and accountability measures (AMs) in response to harvesting activities on a

single island (Puerto Rico, St. Croix) or island group (St. Thomas/St. John) while minimizing the effects of fishing activities on the other islands or island groups;

- Established separate ACLs for each of the commercial and recreational sectors for the Puerto Rico EEZ management area, an area where landings data are available for both the commercial and recreational sectors;
- Set management measures with specific emphasis on harvest prohibition for three parrotfish species (midnight, blue, rainbow) that serve an essential ecological function and that are relatively long-lived;
- Established recreational bag limits for snappers, groupers, and parrotfishes.
- Provided guidelines for triggering AMs and applying those AMs;
- Established framework provisions separately for the Reef Fish and Queen Conch FMPs.

2011 Caribbean ACL Amendment (CFMC 2011b)

Amendment 6 to the Reef Fish FMP, Amendment 5 to the FMP for the Spiny Lobster Fishery, Amendment 3 to the FMP for the Queen Conch Resources, and Amendment 3 to the Coral FMP of Puerto Rico and the U.S. Virgin Islands (2011 Caribbean ACL Amendment), including EIS, Biological Assessment, RIR, RFA, and Social Impact Assessment (CFMC 2011b) became effective on January 29, 2012 (76 FR 82414) and accomplished the following:

- Established ACLs and AMs for reef fish and spiny lobster, and for aquarium trade species in the Reef Fish and Coral FMPs that were not determined to be undergoing overfishing.
- Allocated ACLs among island management areas;
- Established recreational bag limits for reef fish and spiny lobster;
- Removed eight conch species from the Queen Conch FMP;
- Established framework procedures for the Spiny Lobster FMP and modified framework measures for the Coral FMP;
- Revised management reference points and status determination criteria for selected reef fish, spiny lobster, and aquarium trade species.

1.5.2 Recent Council Actions

Caribbean actions implemented in 2013 affected the Coral, Queen Conch, and Reef Fish FMPs. Updated management histories for these FMPs can be found in: Amendment 4 to the Coral FMP (CFMC 2013a), Regulatory Amendment 2 to the Queen Conch FMP (CFMC 2013b), and Regulatory Amendment 4 to the Reef Fish FMP (CFMC 2013c), respectively. The new management measures in these amendments are summarized below. To date, there are no new actions affecting the Spiny Lobster FMP. A complete list of current management measures for U.S. Caribbean managed species can be found in Appendix B.

CORALS AND REEF ASSOCIATED PLANTS AND INVERTEBRATES

Amendment 4 to the Coral FMP of Puerto Rico and the USVI (CFMC 2013a)

Amendment 4 removed seagrass species from the Coral FMP. The final rule implementing this amendment published in the *Federal Register* on June 4, 2013 (78 FR 33255), with an effective date of July 5, 2013. In this amendment, the Council determined that federal management of seagrass species was unnecessary because there is no known harvest of seagrasses, and these species occur predominantly in Puerto Rico commonwealth and USVI territorial waters. In addition, seagrasses are designated as EFH and HAPCs in all of the Council FMPs, and would continue to be protected by these designations.

QUEEN CONCH

Regulatory Amendment 2 to the Queen Conch FMP of Puerto Rico and the USVI (CFMC 2013b).

This regulatory amendment modified the commercial trip limit for the harvest of queen conch in U.S. Caribbean federal waters to be compatible with the trip limit in USVI territorial waters. The final rule published in the *Federal Register* on September 12, 2013 (78 FR 56171), with an effective date of October 15, 2013. Regulatory Amendment 2 modified the commercial trip limit in federal waters to 200 queen conch per vessel per day from the current 150 queen conch per licensed

commercial fisher per day. The recreational bag limit for the harvest of queen conch in the U.S. EEZ remained the same.

REEF FISH

Regulatory Amendment 4 to the Reef Fish FMP of Puerto Rico and the USVI (Regulatory Amendment 4) (CFMC 2013c).

Regulatory Amendment 4 established minimum size limits for parrotfish harvest in federal waters off St. Croix, USVI. The final rule published in the *Federal Register* on July 30, 2013 (78 FR 45894), with an effective date of August 29, 2013. Measures in Regulatory Amendment 4 included:

- A commercial and recreational minimum size limit of 8 inches fork length for redband parrotfish (*Sparisoma aurofrenatum*) in federal waters off St. Croix.
- A commercial and recreational minimum size limit of 9 inches fork length for all other allowable parrotfish species in federal waters off St. Croix: redfin parrotfish (*Sparisoma rubripinne*), redtail parrotfish (*S. chrysopteron*), stoplight parrotfish (*S. viride*), princess parrotfish (*Scarus taeniopterus*), queen parrotfish (*Scarus vetula*), and striped parrotfish (*Scarus iserti*).
- No minimum size limits were implemented for parrotfish harvest in federal waters off St. Thomas/St. John or Puerto Rico.

1.6 Current Management Reference Points or Proxies for Council Managed Species

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires that FMPs specify a number of reference points for managed fish stocks.

Management Reference Points

- **Optimum Yield (OY)** – The amount or yield that provides the greatest overall benefit to the Nation, taking into account food production, recreational opportunities, and the protection of marine ecosystems.
- **Maximum Sustainable Yield (MSY)** – The greatest amount or yield that can be sustainably harvested under prevailing environmental conditions.
- **Overfishing Threshold** – The maximum rate of fishing a stock can withstand (i.e., the maximum fishing mortality threshold) or maximum yield a stock can produce (overfishing limit (OFL)), annually, while still providing MSY on a continuing basis.
- **Overfished Threshold** (i.e., minimum stock size threshold) – The biomass level below which a stock would not be capable of producing MSY.
- **Acceptable Biological Catch (ABC)** – A level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty.

In 2007, the Magnuson-Stevens Act added new requirements to end and prevent overfishing through the use of ACLs and AMs with the purpose of addressing management uncertainty.

- **Annual Catch Limit (ACL)** – The annual level to which catch is limited in order to prevent overfishing from occurring. Exceeding the ACL may result in application of accountability measures.
- **Accountability Measures (AMs)** – Management controls to prevent ACLs, including sector-specific ACLs, from being exceeded, and to correct or mitigate overages of the ACL if they occur.

Together, these parameters are intended to provide the means to measure the status and performance of fisheries relative to established goals.

The National Standard 1 (NS1) guidelines direct regional Fishery Management Councils to adopt other measures of productive capacity as reasonable proxies when direct estimation of MSY and other key parameters is not possible (CFMC 2011a, b). The Magnuson-Stevens Act places several key constraints on what can be considered reasonable options. The OY must be less than or equal to the MSY. The ACL and OY should generally be reduced from the overfishing threshold and MSY, respectively, to effectively prevent

overfishing. The ACL must be less than or equal to the ABC level recommended by a Council's Scientific and Statistical Committee (SSC) or other established peer-review process, and the ABC recommendation must be less than or equal to the OFL (CFMC 2011a).

As discussed in Section 1.5.1, the 2010 and 2011 Caribbean ACL Amendments (CFMC 2011a, b) redefined and/or established management reference points or proxies for all Council managed species and also set ACLs and AMs. These processes are summarized below.

Management of stocks addressed in the 2010 Caribbean ACL Amendment (2010 stocks)

Stocks addressed in this amendment included units that at the time were experiencing overfishing. The 2010 Caribbean ACL Amendment (CFMC 2011a) redefined management reference points or proxies for snappers, groupers, parrotfish, and queen conch based on the longest time series of landings pre-dating the 2005 Caribbean SFA Amendment (CFMC 2005), landings data that were considered to be consistently reliable within each of the island groups (Puerto Rico, St. Croix, St. Thomas/St. John) and sectors (commercial, recreational) to which each time series applied. The 2010 Caribbean ACL Amendment also established ACLs and specified AMs for these units or stocks. Most of these stocks were determined to be 'subject to overfishing' at the time of preparation of this amendment.

Before the establishment of the 2010 Caribbean ACL Amendment, estimates of reference points or proxies were at a smaller scale/finer resolution for some groups (i.e., for species or units within the snapper and grouper complexes). In the 2010 Caribbean ACL Amendment, reference points were redefined for aggregate groups rather than for individual species or units within complexes (except snapper in Puerto Rico). This approach was taken because U.S. Caribbean fishermen report large numbers of unclassified species making it difficult and impractical to monitor fishery performance at the species or unit level¹. This approach is supported by the NS1 guidelines in situations where data do not support stock-specific monitoring, management, and assessment.

Based on the availability of species-specific data for snapper in Puerto Rico and on the relatively small proportion of unclassified landings within the snapper category, the Council decided to define unit-specific reference points for snapper in Puerto Rico. However, the inclusion of specific species in the newer reporting forms in Puerto Rico and the USVI is a step taken to move to manage at the individual level. Increased reporting to species is a goal of ongoing

¹ In theory, defining management reference points at the finest resolution possible could be considered an ideal approach to monitoring fishery performance. Aggregate reference points would make it more difficult for fishery scientists and managers to monitor the status of individual species or units. For Council managed stocks that are subject to overfishing and/or overfished, regulations have been implemented to end overfishing and rebuild those stocks; however the response of individual species to those regulations may become less apparent because reference points are redefined at the aggregate level. Although it is a worthwhile goal to manage at the level of the individual species, in practice this is difficult for many U.S. Caribbean species due to data limitations (CFMC 2011a).

efforts by the local governments, and NMFS in cooperation with the commercial fishers of the U.S. Caribbean (NMFS 2012a). National Standard 1 also directs the use of species-specific data when available. Nevertheless, the Council can implement species-specific regulations regardless of whether reference points are defined at the individual or aggregate level.

For 2010 stocks (snapper, grouper, parrotfish, and queen conch), the MSY proxies for the Puerto Rico commercial sector, queen conch commercial and recreational sector combined, and for St. Croix were estimated by using average annual commercial landings during 1999-2005. For St. Thomas/St. John, the MSY proxy was estimated by using average landings from 2000-2005. The MSY proxy for Puerto Rico’s recreational sector was estimated by using average recreational catch from MRFSS during 2000-2005.

Overfishing limits for 2010 stocks for each island/sector were estimated by setting them

equal to the MSY proxies. Although for purposes of overfishing status determinations, the OFLs for all 2010 stocks/complexes were defined at the level of the entire U.S. Caribbean region (Puerto Rico, St. Croix, and St. Thomas/St. John combined). These Caribbean-wide OFLs for 2010 stocks were set equal to the sum of all the individual OFLs for each unit for all three island groups (Table 1.6.1). Bycatch mortality was not explicitly incorporated into the OFL estimates.

For Council managed stocks addressed in both the 2010 and 2011 Caribbean ACL Amendments, the MSY represents the maximum yield a species or unit can provide in the long term, while the OFL estimates the amount of annual catch above which overfishing is occurring. The annual OFL values established in the 2010 and 2011 Caribbean ACL Amendments would remain constant at the MSY level until stock biomass can be estimated.

Table 1.6.1. Overfishing limits for stocks addressed in the 2010 Caribbean ACL Amendment. Source: CFMC (2011a).

FMU	Individual OFL (lbs)				Caribbean-Wide OFL (lbs)	
	Puerto Rico		St. Croix	St. Thomas/St. John		
	Sectors					
	Commercial	Recreational				
Queen Conch	403,349	N/A	107,720	1,649	512,718	
Snapper	<i>SU 1</i>	334,923	112,384	121,113	157,382	1,915,759
	<i>SU 2</i>	171,666	40,953			
	<i>SU 3</i>	406,794	97,833			
	<i>SU 4</i>	439,171	33,540			
	<i>Total</i>	1,352,554	284,710			
Grouper	208,839	90,839	35,806	60,999	396,483	
Parrotfish	127,980	N/A	293,219	48,818	507,059	

¹ The Parrotfish OFL for Puerto Rico is only commercial. Allocations were made from the ABC.

Annual catches would be evaluated relative to the Caribbean wide OFLs to determine whether overfishing is or is not occurring. This approach is consistent with the NS1 guidelines, which provide fishery managers the flexibility to determine if overfishing occurs based on either fishing mortality rates or actual annual catch. Scientists (in consultation with managers) evaluate the cause of the reported catch increase prior to making a determination that a species or unit has exceeded its OFL. Overfishing is occurring if scientists (in consultation with managers) determine that the reported increase in landings represents an actual increase in landings or just improved data collection and monitoring (CFMC 2011a).

At the time of the preparation of the 2010 Caribbean ACL Amendment, the following stocks were determined to be 'subject to overfishing' (as reported in the [2011 2nd Quarter Update](#) on the NMFS Status of U.S. Fisheries):

- queen conch
- parrotfish
- Grouper Unit 1 (Nassau grouper)
- Snapper Unit 1 (silk, black, blackfin, vermilion)
- Grouper Unit 4 (yellowfin, red, tiger, yellowedge², and misty)

See Section 3.2.2 for overfishing and overfished definitions, an overview of the stock status determination process, and for the current status of managed species.

² In the 2010 Caribbean ACL Amendment, yellowedge and misty groupers were placed in a newly created FMU: Grouper Unit 5; and black grouper was added to Grouper Unit 4.

In the 2010 Caribbean ACL Amendment, the Council considered the overfishing status of stocks when determining how much uncertainty (percent reduction) should be applied to the OFL or the ABC (if determined) to derive the ACLs. The optimum yield (OY) for all 2010 stocks was set equal to the ACL.

For snapper and grouper for all islands/island groups and for both Puerto Rico sectors (commercial and recreational), the ACL was determined by applying an uncertainty reduction of 15% to the individual OFLs (i.e., $OY=ACL= OFL \times [0.85]$). This precautionary approach was taken because of both the combined management and scientific uncertainty inherent in the data, and the many changes that have taken place in the U.S. Caribbean since 2005.

The Council's SSC only derived ABC estimates for parrotfish (all islands) and queen conch (only for St. Croix, which is the only area in federal waters where fishing for queen conch is currently allowed). An uncertainty reduction was not applied to the SSC's recommendation for queen conch, thus the ACL for St. Croix was set equal to the 50,000 pound ABC. Annual catch limits for queen conch in Puerto Rico and St. Thomas/St. John were set at zero, as harvest continues to be prohibited in those areas. For parrotfish (all islands and both Puerto Rico sectors), the ACL was determined by applying an uncertainty reduction of 15% to the ABC recommended by the SSC, for the same reasons discussed earlier for snapper and grouper (i.e., $OY=ACL= ABC \times [0.85]$). Landings of parrotfish species are far more

substantial in St. Croix than in Puerto Rico and St. Thomas/St. John. For this reason, the parrotfish ACL in the St. Croix management area was further reduced to address uncertain effects of that harvest on essential settlement substrate for Acroporid corals. This additional reduction to the parrotfish ACL in St. Croix consisted of a 5.8822% (15,000 pounds) reduction to the preliminary 255,000 pounds ACL in order to attain a final ACL of 240,000 pounds (CFMC 2011a).

Annual catch limits for GU1 and GU2 were set as zero for these units, as harvest continues to be prohibited in federal waters for these species. Finally, the 2010 Caribbean ACL Amendment established harvest prohibitions for midnight, blue, and rainbow parrotfish and thus, ACLs for these species were also set at zero.

Management of stocks addressed in the 2011 Caribbean ACL Amendment (2011 stocks)

The 2011 Caribbean ACL Amendment (CFMC 2011b) addressed the remainder of Council managed species, such as spiny lobster, triggerfish, and jacks (see Table 3.2.1.1 for a complete list of the species included in these FMUs). These FMUs were identified as not being subject to overfishing at the time of preparation of that comprehensive amendment to the FMPs. Management reference points or proxies for these FMUs were established or redefined based on the longest year sequence of reliable landings data. The 2011 Caribbean ACL Amendment also established ACLs and AMs for these stocks.

Estimates of reference points or proxies for stocks addressed in the 2011 Caribbean ACL Amendment were also redefined for aggregate groups rather than for individual species or units within complexes. For most of the 2011 stocks, the MSY proxies for the Puerto Rico commercial sector were estimated by using the median of annual commercial landings during 1988-2009. The MSY proxies for Puerto Rico's recreational sector were estimated by using the median annual recreational landings from MRFSS during 2000-2009. For the spiny lobster in Puerto Rico, the single MSY proxy equates to the median of annual landings calculated using commercial landings data for 1988-2009. Due to commercial landings data limitations, the MSY proxies for the Puerto Rico surgeonfish and angelfish FMUs (commercial and recreational sectors) were based on the maximum single year of Puerto Rico recreational landings multiplied by three. This same approach was used to calculate the MSY proxy for the Tilefish FMU, which is a Caribbean-wide FMU. The Aquarium trade species FMU is also a Caribbean-wide FMU, and its MSY was based on median annual commercial and recreational Puerto Rico landings from 1988-2009.

For all 2011 stocks in St. Croix, the MSY proxy was estimated by using mean annual landings from 1999-2008. For all St. Thomas/St. John stocks, the MSY proxy was estimated by using mean annual landings from 2000-2008.

Contrary to the approach used for 2010 stocks, the 2011 Caribbean ACL

Amendment defined OFLs for stocks/complexes by island region (i.e. Puerto Rico, St. Croix, St. Thomas/St. John) (Table 1.6.2). As discussed earlier for 2010 stocks, annual catches would be evaluated relative to the OFLs (individual island OFLs in this case), to determine whether overfishing is occurring.

As noted above, none of the stocks/complexes addressed in the 2011 Caribbean ACL Amendment was identified as ‘subject to overfishing’ at the time of the preparation of that amendment. In fact, 2011 stocks were determined to be of status ‘unknown’, as reported in the 2011 2nd Quarter Update of the NMFS Status of U.S. Fisheries: http://www.nmfs.noaa.gov/sfa/statusoffisheries/2011/second/Q2_2011_FSSI_nonFSSIstockstatus.pdf. A stock is classified as ‘unknown’ when the data in a stock assessment (or equivalent) were insufficient to provide a conclusion about the overfishing and/or overfished status. Since then, continuing monitoring of annual

catches for these stocks have not indicated overages from their respective OFLs, thus 2011 stocks have been identified as ‘not subject to overfishing’. Please see Section 3.2.2 for overfishing and overfished definitions and current status of managed species.

For the Puerto Rico FMUs included in the 2011 Caribbean ACL Amendment, the OFLs were set equal to the MSY adjusted with the “Only Reliable Catch” (ORCS) method. This method was not available for the 2010 stocks and therefore not used for those groups, nor was it used to estimate these values for USVI stocks included in the 2011 Caribbean ACL Amendment. Thus, OFLs for USVI FMUs, as well as for the Caribbean-wide aquarium trade species FMU, were set equal to the MSY proxy only. Bycatch mortality was not explicitly incorporated into the OFL estimates. For more information about ORCS please see CFMC (2011b).

Table 1.6.2. Overfishing limits for stocks addressed in the 2011 Caribbean ACL Amendment. Source: CFMC 2011b.

FMU	Individual OFL (lbs)				FMU	Caribbean -Wide OFL
	Puerto Rico		St. Croix	St. Thomas/ St. John		
	Sectors					
	Commercial	Recreational				
Angelfish	11,978	5,989	406	10,529	Tilefish Aquarium Trade Sps.	16,269 10,873
Boxfish	95,683	5,129	9,370	30,978		
Goatfishes	19,517	402	4,184	356		
Grunts	202,662	5,587	40,979	41,797		
Jacks	95,621	56,668	17,210	58,785		
Porgies	27,488	2,863	5,153	24,243		
Spiny Lobster	364,355	--	119,230	115,777		
Squirrelfish	18,514	4,323	134	4,712		
Surgeonfish	9,572	4,786	44,804	38,999		
Triggerfish & Filefish	64,972	24,365	27,755	82,719		
Wrasses	60,163	5,611	8	650		

The ABC for all 2011 stocks was set equal to the OFL. Similar to 2010 stocks, the OY was set equal to the ACL. Annual catch limits for most of the 2011 stocks in Puerto Rico, St. Croix, and St. Thomas/St. John, as well as for the Caribbean-wide tilefish FMU, were derived from a 10% reduction to the ABC (i.e., $OY=ACL= ABC \times [0.90]$). The ACL for the spiny lobster FMU in Puerto Rico was set as a single value for both the commercial and recreational sectors. For all of these stocks, based on the history of landings for both Puerto Rico and the USVI, the Council decided that applying a 10% uncertainty to the ABC would reduce the risk of exceeding the OFL if the ACL is exceeded. Reducing the likelihood of exceeding the ACL reduces the risk of applying AMs. If AMs are applied, the result would be a reduction in the length of the fishing season to ensure that the ACL is not exceeded again, thereby ensuring that

the OFL is not exceeded and therefore that overfishing is not a continuing problem (CFMC 2011b).

Exceptions to the application of the 10% buffer were the surgeonfish and angelfish FMUs in both Puerto Rico and in St. Croix and St. Thomas/St. John. These FMUs had 25% buffer reductions applied to their ABCs to account for the important role of these species in coral reefs as herbivores and spongivores, respectively. The ACL for the Caribbean-wide Aquarium trade species FMU was also derived from a 25% buffer reduction to the ABC, this time to account for uncertainty in landings and harvest patterns in federal waters.

Table 1.6.3 summarizes how these reference points or proxies were established for all managed species in both amendments (CFMC 2011a, b).

Table 1.6.3. Management reference points or proxies for all Council managed species (CFMC 2011a, b).

Reference Point or Proxy	Island/Island Group: species complex	Definitions of Reference Points or Proxies
Snapper, Grouper, Parrotfish and Queen Conch FMUs (CFMC 2011a)		
MSY	Puerto Rico: snapper, grouper, parrotfish	MSY proxy = Commercial: average annual landings from 1999-2005 Recreational: average annual catch from MRFSS during 2000-2005
	Puerto Rico: queen conch	MSY proxy = average annual commercial landings from 1999-2005
	St. Croix (STX) and St. Thomas/St. John (STT/STJ): snapper, grouper, parrotfish, and queen conch	MSY proxy = average annual commercial landings from: 1999-2005 for St. Croix 2000-2005 for St. Thomas/St. John
OFL¹	All FMUs for Puerto Rico, STT/STJ, and STX	OFL = MSY proxy ; overfishing occurs when annual landings exceed the OFL, unless NMFS' Southeast Fisheries Science Center (in consultation with the Council and its SSC) determines the overage occurred because data collection/monitoring improved, rather than because catches actually increased.
ABC	Parrotfish	ABC = Puerto Rico = 80,000 pounds (lbs) St. Croix = 300,000 lbs St. Thomas/St. John = 50,000 lbs
	Queen Conch	ABC = 50,000 lbs for St. Croix = 0 lbs for St. Thomas/St. John = 0 lbs for Puerto Rico
	Snapper and grouper (Puerto Rico, STT/STJ, and STX)	ABC = OFL
OY and ACL	Snapper and grouper (Puerto Rico, STT/STJ, and STX)	OY = ACL = [OFL x (0.85)]
	Parrotfish (Puerto Rico, STT/STJ, and STX)	OY = ACL = [ABC specified by SSC x (0.85)] St. Croix: an additional 5.8822% reduction
	Grouper Units 1 (Nassau) and 2 (goliath), midnight parrotfish, blue parrotfish, rainbow parrotfish (All islands)	OY = ACL = 0
	Queen conch	St. Croix: OY = ACL = ABC specified by SSC Puerto Rico and STT/STJ: OY = ACL = 0
Angelfish, Boxfish, Goatfish, Grunts, Wrasses, Jacks, Scups and Porgies, Squirrelfish, Surgeonfish, Triggerfish and Filefish, Spiny Lobster, Tilefish, Aquarium Trade FMUs (CFMC 2011b)		
MSY	Puerto Rico: grunts, goatfishes, squirrelfish, scups & porgies, jacks, triggerfish & filefish, boxfish, and wrasses FMUs	MSY proxy = Median annual landings from: Commercial: 1988-2009 Recreational: 2000-2009
	Puerto Rico: spiny lobster FMU	MSY proxy = Median annual landings from 1988-2009
	Puerto Rico: surgeonfish, angelfish, and tilefish FMUs (Caribbean wide)	MSY proxy = Maximum of a single year of recreational landings x 3.
	St. Croix and St. Thomas/St. John: grunts, goatfishes, squirrelfish, scups & porgies, jacks, triggerfish & filefish, boxfish, wrasses, angelfish, and surgeonfish , and spiny lobster FMUs	MSY proxy = Mean annual landings from: 1999-2008 for St. Croix 2000-2008 for St. Thomas/St. John
	Aquarium trade species FMU (Caribbean wide)	MSY proxy = median annual landings from years 1988-2009 obtained from Puerto Rico commercial and recreational landings.
OFL²	Puerto Rico (all FMUs)	OFL = MSY proxy adjusted using the ORCS ³ scalar; overfishing occurs when annual landings exceed the OFL, unless NOAA Fisheries' Southeast Fisheries Science Center (in consultation with the Council and its SSC) determines the overage occurred because data collection/monitoring improved, rather than because landings actually increased.
	USVI (all FMUs); aquarium trade FMU (all islands)	OFL = MSY proxy ; overfishing occurs when annual landings exceed the OFL, unless NOAA Fisheries' Southeast Fisheries Science Center (in consultation with the Caribbean Fishery Management Council and its SSC) determines the overage occurred because data collection/monitoring improved, rather than because landings actually increased.
ABC	All FMUs, for Puerto Rico, STT/STJ, and STX	ABC= OFL
OY and ACL	Grunts, goatfishes, squirrelfish, scups & porgies, jacks, triggerfish & filefish, boxfish, wrasses, spiny lobster FMUs (PR, STT/STJ, and STX), and tilefish FMU (Caribbean wide)	OY = ACL = [ABC x (0.90)]
	Surgeonfish and angelfish FMUs (PR, STT/STJ, and STX); aquarium trade FMU (Caribbean wide)	OY = ACL = [ABC x (0.75)]

¹OFLs defined for the entire Caribbean Region. ²OFLs defined per island/island group. ³ORCS methodology can be found in CFMC (2011b)

Accountability Measures

Accountability measures apply to all species except queen conch, prohibited corals, and species with harvest moratoria (e.g., goliath and Nassau grouper). Accountability measures require the NMFS' Assistant Administrator to reduce the length of the fishing season if it has been determined that prior year(s) landings exceeded the ACL for that species and/or species group. For purposes of ACL monitoring, a multi-year average of landings is used. The fishing season would be shortened in the year following an overage determination by the amount necessary to constrain landings to the ACL. If NMFS determines the ACL for a particular species or species group has been exceeded based upon a pre-defined average of landings, scientists (in consultation with managers) evaluate the cause of the reported catch increase prior to making a determination that a species or unit has exceeded its assigned ACL. Specifically, they would consider whether the reported increase represents an actual increase in landings or just improved data collection and monitoring. The intent of this definition is to eliminate any incentive for fishermen to under-report or misreport catches to avoid exceeding ACLs and triggering associated AMs.

To determine ACL overages in the USVI and Puerto Rico sectors that would apply in 2013 for 2010 stocks, the average of the landings from 2010 and 2011 were compared to the corresponding ACL for a particular unit. For 2011 stocks, the most recent landings available corresponded to the year 2011 and thus were compared to the corresponding ACL.

NMFS determined that several ACLs were exceeded based on 2011 landings and/or the average of 2010 and 2011 landings, triggering AMs to reduce the length of the fishing season in the 2013 fishing year by the amount necessary to ensure landings do not again exceed the ACL. In 2013, the commercial sector of SU2 in Puerto Rico, the recreational sector of wrasses in Puerto Rico, triggerfish and filefish (commercial and recreational) in St. Croix, spiny lobster (commercial and recreational) in St. Croix, and groupers (commercial and recreational) in St. Thomas/St. John had AM-based closures during that year (FR 78 18247).

To monitor the ACLs and determine if AMs need to be applied for any unit in 2014, NMFS conducted the following analysis. For USVI 2010 stocks the average of landings from 2010, 2011, and 2012 was compared against the individual corresponding ACL. For USVI 2011 stocks, the average of landings from 2011 and 2012 was compared against the individual corresponding ACL.

To monitor the recreational ACLs in Puerto Rico and determine if AMs need to be applied for any unit in 2014, NMFS conducted the following analysis. For 2010 stocks the average of landings from 2010, 2011, and 2012 was compared with the individual corresponding ACL. For the Puerto Rico commercial sector, the average of landings from 2010 and 2011 was compared to the individual corresponding ACL, as landings for 2012 were not available at the time of evaluating the ACL for AM purposes.

Chapter 2. Proposed Action and Alternatives

2.1 What is the Proposed Action?

ACTION: Establish a control rule to adjust the buffer reduction applied to the overfishing limit (OFL) or to the acceptable biological catch (ABC) used to derive the annual catch limit (ACL) to reflect a change in overfishing status of the stock.

2.2 List of Alternatives

Alternative 1: No Action. Do not establish a control rule to adjust the buffer reduction applied to the OFL or the ABC to determine the ACL for all fishery management units (FMUs) for which harvest is allowed. The buffer reductions to the OFL or the ABC would continue to be those defined in the 2010 and 2011 Caribbean ACL Amendments.

Alternative 2: For all FMUs for which harvest is allowed (or where applicable), establish an ACL Control Rule where $ACL = [OFL \text{ (or ABC)} \times (0.85)]$ for FMUs determined to be subject to overfishing, and where $ACL = [OFL \text{ (or ABC)} \times (0.90)]$ for FMUs determined not to be subject to overfishing in a specific year.

Preferred Alternative 3* : Establish an ACL Control Rule where $ACL = [OFL \text{ (or ABC)} \times (0.85)]$ for FMUs determined to be subject to overfishing, and where $ACL = [OFL \text{ (or ABC)} \times (0.90)]$ for FMUs determined not to be subject to overfishing in a specific year. The ACL control rule would apply to FMUs for which harvest is allowed, with the exception of the following FMUs, for which buffer reductions to the OFL or ABC specified in the 2010 and/or 2011 Caribbean ACL amendment would continue to be applied to derive the ACL:

Preferred Sub-alternative 3a. Parrotfish FMU – As defined in the 2010 Caribbean ACL Amendment, $ACL = [ABC \times (0.85)]$. An additional 5.8822% reduction to the ACL of the parrotfish FMU would continue to be applied in the St. Croix management area to further reduce harvest from this direct fishery in recognition of the ecological role of parrotfish as herbivores.

Preferred Sub-alternative 3b. Surgeonfish FMU – As defined in the 2011 Caribbean ACL Amendment, $ACL = [ABC \times (0.75)]$ to reflect the ecological role of surgeonfish as herbivores in coral reefs.

(Cont.) 2.2 List of Alternatives

Preferred Sub-alternative 3c. Angelfish FMU – As defined in the 2011 Caribbean ACL Amendment, $ACL = [ABC \times (0.75)]$ to reflect the ecological role of angelfish as spongivores in coral reefs.

Preferred Sub-alternative 3d. Queen conch FMU – As defined in the 2010 Caribbean ACL Amendment, for St. Croix, $ACL = ABC$ specified by the Caribbean Fishery Management Council's Scientific and Statistical Committee. For Puerto Rico and St. Thomas/St. John, $ACL = 0$.

Preferred Sub-alternative 3e. Aquarium trade species FMU – As defined in the 2011 Caribbean ACL Amendment, $ACL = [ABC \times (0.75)]$ for aquarium trade species in the Corals and Reef Associated Plants and Invertebrates Fishery Management Plan (FMP) and in the Reef Fish FMP.

* **Alternative 3** can have more than one preferred sub-alternative.

2.2.1 Discussion of the Alternatives

This action would develop a control rule to adjust the ACL for U.S. Caribbean FMUs based on the current overfishing status of the FMU as determined by the National Marine Fisheries Service (NMFS). Establishing this control rule would provide the Council and NMFS the flexibility to respond quickly to changes in the fishery. The ACL Control Rule proposes to change the buffer reduction applied to the overfishing limit (OFL) or to the acceptable biological catch (ABC) (if determined) to derive the ACL for each Fishery Management Unit (FMU) and sector within the unit. The buffer reduction applied would depend on the overfishing status of each FMU. Overfishing is determined to be occurring if the annual landings exceed the assigned OFL, unless NMFS' Southeast Fisheries Science Center (SEFSC), in consultation with the Caribbean Fishery Management Council (Council) and its Scientific and Statistical Committee (SSC), determines that the overage occurred because data collection/monitoring improved, rather than because landings actually increased.

The control rule would not take into account the overfished status of a stock because overfished stocks are managed through rebuilding plans designed to achieve a stock abundance consistent with supporting the maximum sustainable yield on a continuing basis. Overfished species were addressed in the 2005 Sustainable Fisheries Act (CFMC 2005), where management measures

such as season and area closures to protect spawning aggregations were established to rebuild the stocks. These measures were meant to address overfished status in the long-term and were factored in during the development of the 2010 and 2011 Caribbean ACL Amendments. The control rule proposed in this amendment will continue to ensure that overfishing does not occur in the short-term, thereby maintaining steady progress toward the long-term goal of rebuilding overfished stocks while preventing other stocks from becoming overfished.

Alternative 1 is the no action alternative and would not establish an ACL control rule, thus would retain the current buffer reductions to the OFL or ABC used to determine the ACL for each FMU and sector within the unit as established in the 2010 and 2011 Caribbean ACL Amendments (CFMC 2011a, b). These buffers are not adjustable. These buffer reductions were selected by the Council after having been evaluated against several other buffer alternatives (NMFS 2011a, b). The buffers chosen were the ones that the Council considered would provide the best balance between maximizing harvest while preventing overfishing. As discussed in Chapter 1, most of the stocks addressed in the 2010 Caribbean ACL Amendment (2010 stocks) were determined to be ‘subject to overfishing’ at the time of preparation of that amendment and their ACLs were set at 85% of the OFL or ABC. This precautionary approach was taken because of both the combined management and scientific uncertainty inherent in the data, and the many changes that have taken place in the U.S. Caribbean since 2005. Stocks addressed in the 2011 Caribbean ACL Amendment (2011 stocks) were not identified as being subject to overfishing, and for most of them the ACL was set at 90% of the ABC. For these 2011 stocks, for example, based on the history of landings for both Puerto Rico and the USVI, the Council determined that applying a 10% uncertainty reduction to the ABC would reduce the risk of exceeding the ACL and, by extension, the OFL. Reducing the likelihood of exceeding the ACL reduces the risk of applying accountability measures (AMs). Accountability measures would reduce the fishing season to ensure that the ACL is not exceeded again, thereby ensuring that the OFL is not exceeded, and therefore that overfishing is not a continuing problem (CFMC 2011b). Also, as discussed in Section 1.6, the ACL for some of the 2010 and 2011 stocks, such as parrotfish, queen conch, surgeonfish, angelfish, and aquarium trade species³, was derived from different buffer reductions to the OFL or the ABC.

Since the completion of these amendments, the status of several of the FMUs has changed, particularly for the 2010 stocks, and some FMUs previously classified as ‘subject to overfishing’ are now no longer classified as ‘subject to overfishing’ (as of the 2012 Annual Report to Congress on the Status of U.S. Fisheries [NMFS 2013a]). If no action is taken and the control

³ In the 2010 Caribbean ACL amendment, the queen conch ACL was set equal to the ABC recommended by the SSC with no reduction applied, a management measure that also supports the queen conch rebuilding plan. The parrotfish FMU for each island region was set at 85% of the SSC’s recommended ABC for each island; however, an additional reduction was applied to the St. Croix ACL to account for the important contributions of parrotfish to the health and vibrancy of Caribbean coral reefs. For the 2011 stocks surgeonfish and angelfish, the ACL was set at 75% of the ABC due to the ecological role of these species as herbivores and spongivores in the coral reef, respectively. Finally, the Caribbean-wide ACL for the aquarium trade species FMU was also derived from a 25% reduction to the ABC to account for uncertainty in the landings data and harvest patterns of this group in federal waters.

rule is not implemented, the Council would not have a mechanism in place to respond quickly to changes in overfishing status when they occur. Under **Alternative 1**, if an FMU is no longer ‘subject to overfishing’ but the buffer that is applied to derive the ACL remains at a more restrictive level, catches would be excessively constrained. This restriction could result in lost yield, which may have economic repercussions for fishermen, as well as other biological and social impacts.

On the contrary, if an FMU becomes ‘subject to overfishing’ but the status quo buffer that corresponds to that FMU is not adjusted to be more conservative, this could create a risk of exceeding the overly liberal ACL and, by extension, the OFL, even though the stock may in fact already be suffering from overharvest. Continuous overfishing of a stock decreases its biomass and increases the likelihood of the stock becoming overfished. Under **Alternative 1**, if the Council decides to address changes in overfishing status for managed species, they would have to do so through the lengthier full plan amendment process, limiting the Council’s ability to implement regulatory changes in a timely manner.

Alternative 2 would establish a control rule to modify the buffer reduction that is applied to the OFL or the ABC (if defined) to derive an ACL in response to changes in the overfishing status of any U.S. Caribbean FMU. The ACL Control rule proposed in **Alternative 2** would apply to all FMUs for which harvest is allowed, with no exceptions. The ACL Control Rule would adjust the buffer reduction for an FMU based on the current overfishing status of the FMU as determined by NMFS (see Section 3.2.2 for a discussion about the process to determine the overfishing status of a stock). The ACL Control Rule would specify that, if in a particular year, based on the most recent available landings, an FMU is determined to not be ‘subject to overfishing’, a 10% buffer reduction would be applied to the OFL or the ABC (if defined) to derive the ACL for the next year for that particular unit or sector within the unit. This will also apply if the status of an FMU is classified as ‘unknown’. The ACL Control Rule would also specify that if in a particular year, based on the most recent available landings, an FMU is determined to be ‘subject to overfishing’, a 15% buffer reduction would be applied to the OFL or the ABC (if defined) to derive the ACL for the next year for that particular unit or sector within the unit.

Because **Alternative 2** would apply the control rule to all managed species for which harvest is allowed, it would not support the special buffers that currently apply for the parrotfish, queen conch, surgeonfish, angelfish, and aquarium trade species FMUs. As discussed in Section 1.6 and summarized above, these special buffers were established by the Council in the 2010 and the 2011 Caribbean ACL Amendments for various management considerations. **Alternative 2** would change the current relationship between the OFL or ABC and the ACL for all of these units for each region and sector (if applicable) if their overfishing status changes in a particular year.

Similar to **Alternative 2, Preferred Alternative 3** would also establish an ACL Control Rule that would change the buffer applied to the OFL or the ABC (if specified) to derive the ACL for each FMU and sector within the unit based on changes in overfishing status. Although the ACL Control Rule proposed in **Preferred Alternative 3** would also apply to FMUs for which harvest is allowed, it would also allow for some units (parrotfish, surgeonfish, angelfish, aquarium trade species, and queen conch) to be exempted from the rule as selected by the Council through **Preferred Sub-alternatives 3a-3e**. For any of these units and sectors within the unit, buffers, and thus ACLs specified in the 2010 and 2011 Caribbean ACL Amendments, would remain valid (status quo), as discussed for **Alternative 1**. These FMUs in **Preferred Sub-alternatives 3a-3e** are proposed to be exempted from the rule because buffers for these units were based on factors such as ecological importance of the species, species that are currently managed under a partial harvest prohibition, or species for which harvest patterns are unknown, and therefore were not based solely on overfishing status. In addition, for the queen conch, the ACL was set equal to the ABC, and that ABC was set as an annual allowance by the Council's SSC, with no reduction applied. Buffer reductions or values established for these FMUs in the 2010 and 2011 Caribbean ACL Amendments support the lowest catch level that the Council considered necessary to prevent overfishing. **Preferred Sub-alternatives 3a through 3e** are discussed below.

Preferred Sub-Alternative 3a would retain the buffer reduction, and thus the ACL established in the 2010 Caribbean ACL Amendment, for the parrotfish FMU in each island region and sector. The buffer reduction applied to the ABC to derive the ACL considered the ecological role of parrotfish as herbivores in the coral reef and their contribution to maintain *Acropora* critical habitat at an optimum balance. As discussed in Section 1.6, the 2010 Caribbean ACL Amendment defined the parrotfish FMU for each island region at 85% of the SSC's recommended ABC for each island. In addition, the parrotfish ACL for the St. Croix management area was reduced by an additional 5.8822% as a precautionary management measure based on local harvest patterns and to account for the important contributions of parrotfish to the health and vibrancy of Caribbean coral reefs. Although the parrotfish FMU is not considered to be 'subject to overfishing' any longer (since the [2012 4th Quarter Update on the Status of U.S Fisheries](#), and continues to be classified as such in the most recent update on the status of the stocks corresponding to the [1st Quarter of 2014](#)), this sub-alternative would support these management measures established for the parrotfish.

Preferred Sub-Alternatives 3b and 3c would retain the buffers applied in the 2011 Caribbean ACL Amendment for the surgeonfish and angelfish FMUs, respectively. For these FMUs, a 25% reduction was applied to the ABC to derive the ACL because of the important ecological role these species play in coral reef ecosystems. Surgeonfish, like parrotfish, contribute important algal grazing services and thus serves an important role in maintaining critical habitat for Acroporid corals. Angelfish serve as an important spongivore in coral reefs, and with herbivores, contribute to maintain the ecological integrity of Caribbean coral reefs.

Preferred Sub-alternative 3d provides for the queen conch FMU to be exempt from the ACL Control Rule, and thus would retain the ACL established in the 2010 Caribbean ACL Amendment for queen conch. In the 2010 Caribbean ACL amendment, the queen conch ACL for St. Croix was set equal to the 50,000-pound ABC recommended by the Council's SSC with no reduction applied, a management measure that also supports the queen conch rebuilding plan. Annual catch limits for St. Thomas/St. John and Puerto Rico were set at zero, as the harvest of queen conch in federal waters around those islands has been prohibited since the Caribbean SFA Amendment in 2005 (CFMC 2005). Although the queen conch is not undergoing overfishing any longer (since the [2012 4th Quarter Update on the Status of U.S. Fisheries](#) (i.e. Status of the Stocks), and continues to be classified as such in the most recent stock status quarterly update corresponding to the [1st Quarter of 2014](#), it is still considered to be overfished, and continues to be rebuilt under a 15-year rebuilding plan that ends in 2020. This sub-alternative would support current management measures established for the queen conch.

Preferred Sub-alternative 3e would exempt the aquarium trade species FMU from the application of the ACL Control Rule. This FMU contains species in both the Reef Fish FMP and the Coral FMP. The ACL for this FMU is Caribbean-wide and was established in the 2011 Caribbean ACL Amendment. The buffer reduction applied to the ABC to derive the ACL was based on uncertainty in the landings data and harvest patterns of this group in federal waters, as most of the harvest of aquarium trade species takes place in state waters. The ACL for aquarium trade species was derived by reducing the ABC by 25%. **Preferred Sub-alternative 3e** would retain the values set for aquarium trade species FMU in the 2011 Caribbean ACL Amendment, and thus would support current management measures.

In summary, the action of adjusting the buffer reductions applied to management reference points in response to changes in the health of the target species could result in positive or negative impacts to fishers and to the affected stocks depending on the direction of the change. For example, a reduced buffer could benefit fishers by allowing for a slightly larger ACL, although a larger ACL could also make the species more vulnerable to overfishing, which could negatively impact the stock and in the long run, the fishers who depend on that stock. However, the extent of the effects would depend on 1) how often the overfishing status of a stock changes through time and thus triggers the application of the control rule that would result in changes to the ACL and 2) if there is a change in overfishing status, then how much the ACL would change relative to the current ACL. The next sub-section explores the frequency of changes in the overfishing status based on historical landings and then explores potential changes to the current ACLs under the different alternatives proposed. Lastly, we analyze the effects of new buffers that would apply specifically to those stocks that recently experienced changes in overfishing status.

2.1.1.1 Analyses on the Effects of the Proposed Alternatives

A. Comparison between the Overfishing Limit and Historical Landings for Council-Managed Species.

Overfishing is determined to be occurring if annual landings exceed the corresponding OFL, unless NMFS' Southeast Fisheries Science Center (SEFSC), in consultation with the Council and its Scientific and Statistical Committee (SSC), determines that the overage occurred because data collection/monitoring improved, rather than because landings actually increased (CFMC 2011a, b). The following analysis explores, based on historical landings for the most recent five years, how often the overfishing status of a stock would be expected to change through time and thus trigger the application of the control rule that would result in a change to the ACL.

Landings from the most recent five years (four years for the Puerto Rico commercial sector because 2012 data are not yet available) were used as a proxy for future landings (Tables 2.2.1.1.1 - 2.2.1.1.5). Landings are composed of combined harvest in federal and Puerto Rico commonwealth or USVI territorial waters. The annual landings were provided from the SEFSC in October of 2013. These landings represent the most complete Caribbean landings at this time. Puerto Rico commercial landings for 2012 were not provided because they are not complete at this time. Caribbean-wide OFLs for stocks addressed in the 2010 Caribbean ACL Amendment (i.e., 2010 stocks) are provided in Table 2.2.1.1.1. For each of these FMUs, the OFL was calculated by island group and the individual OFLs then summed to derive the Caribbean-wide OFL presented in Tables 2.2.1.1.1 and 2.2.1.1.2 (*Individual OFLs for 2010 stocks are listed in Table 1.6.1 in Section 1.6). For 2010 stocks, the Caribbean-wide OFLs are used to make overfishing status determinations. These tables also include landings for the most recent five years for 2010 stocks divided by island/island region. Overfishing limits for stocks addressed in the 2011 Caribbean ACL Amendment (2011 stocks) per island/island region and sector along with landings for the recent five years are provided in Tables 2.2.1.1.3 through 2.2.1.1.5. The annual landings were examined to see if OFLs were exceeded. Table 2.2.1.1.6 provides a summary of those units who exceeded the OFL and the year they exceeded the OFL.

2010 STOCKS

Stocks addressed in the 2010 Caribbean ACL Amendment have individual OFLs per island and sector that were combined to obtain a Caribbean-wide OFL for each stock/stock complex. None of the 2010 stocks in either Puerto Rico or in St. Croix and St. Thomas/St. John had landings in the last five years that exceeded the corresponding Caribbean-wide OFL (Tables 2.2.1.1.1 - 2.2.1.1.2).

Table 2.2.1.1.1. Puerto Rico commercial and recreational landings in pounds (lbs) for the most recent years (2008-2011 Commercial sector, 2008-2012 Recreational sector) and Caribbean-Wide OFL for 2010 stocks. Landings include harvest in both federal and state waters.

FMU	Puerto Rico										Caribbean-Wide OFL (lbs) ³
	2008		2009		2010		2011		2012		
	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec	Comm ²	Rec	
Queen Conch¹	242,041	--	273,309	--	273,459	--	235,759	--	Not avail.	--	512,718
<i>SU 1</i>	352,975	123,831	369,179	47,995	276,528	42,068	149,268	33,760	Not avail.	36,456	1,915,759
<i>SU 2</i>	261,998	62,761	239,977	4,542	384,877	10,169	218,854	0	Not avail.	7,379	
<i>SU 3</i>	175,321	73,852	148,127	39,344	174,108	35,193	167,303	20,874	Not avail.	41,070	
<i>SU 4</i>	365,868	20,202	222,698	17,015	215,404	10,147	151,284	9,343	Not avail.	17,249	
Grouper	87,738	114,763	87,135	31,635	92,162	21,506	59,715	7,800	Not avail.	18,677	396,483
Parrotfish	90,450	48,129	54,555	49,613	43,909	10,498	38,154	10,280	Not avail.	9,452	507,059

¹ Queen conch landings data is provided only for informational purposes as harvest of queen conch is prohibited in Puerto Rico federal waters. Recreational landings data for queen conch is not collected, therefore is not available.

² Commercial landings for 2012 for Puerto Rico are not provided because they were not available at the time of preparation of this Public Hearing Draft.

³ Caribbean-wide OFLs combine the individual OFLs from all islands/island groups and both the recreational and commercial sectors.

Table 2.2.1.1.2. St. Croix and St. Thomas/St. John commercial landings in pounds (lbs) for the most recent five years (2008-2012) and Caribbean-Wide OFL for 2010 stocks. Landings include harvest in both federal and state waters.

FMU	U.S. Virgin Islands (St. Croix (STX) and St. Thomas/St. John (STT/STJ))										Caribbean-Wide OFL (lbs) ²
	2008		2009		2010		2011		2012		
	STX	STT/STJ	STX	STT/STJ	STX	STT/STJ	STX	STT/STJ	STX	STT/STJ	
Queen Conch	123,681	857	71,557	1,329	81,917	1,577	53,210	1,930	36,771	592	512,718
Snapper	112,389	145,187	96,393	143,615	92,354	121,186	84,463	76,259	64,262	53,624	1,915,759
Grouper	29,585	56,910	34,650	68,602	29,117	60,806	30,800	53,170	29,853	41,184	396,483
Parrotfish	354,997	39,613	316,094	33,049	162,623	34,010	154,531	23,289	118,798	17,224	507,059

¹ Queen conch landings data is provided only for informational purposes as harvest of queen conch is prohibited in St. Thomas/St. John federal waters.

² Caribbean-wide OFLs combine the individual OFLs from all islands/island groups and both the recreational and commercial sectors.

2011 STOCKS

The stocks addressed in the 2011 Caribbean ACL Amendment (2011 stocks) have OFLs for each specific island region (Puerto Rico, St. Croix, and St. Thomas/St. Johns), except for tilefish and aquarium trade species which have Caribbean-wide OFLs. Tables 2.2.1.1.3 through 2.2.1.1.5 show the reported landings for all 2011 stocks for Puerto Rico, St. Croix, and St. Thomas/St. John and for Caribbean-wide tilefish and aquarium trade species from 2008 through 2012 (Puerto Rico commercial landings for 2012 are not included) and the corresponding OFL. There were numerous 2011 stocks that had recent landings that exceeded their corresponding OFL (Table 2.2.1.1.6). Although reported landings for USVI's angelfish, squirrelfish, and wrasses in 2011 and 2012 exceeded the corresponding OFL, high landings were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011.

Table 2.2.1.1.3. Puerto Rico commercial and recreational landings in pounds (lbs) for the most recent years of available information (2008-2011 Commercial sector, 2008-2012 Recreational sector) and individual OFLs for 2011 stocks. Landings include harvest in both federal and state waters.

FMU	PUERTO RICO												
	Landings (lbs)											OFL (lbs)	
	2008		2009		2010		2011		2012 ¹				
	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec	Comm.	Rec.	
Angelfish	0	0	0	265	0	0	0	167	NA	0	11,978	5,989	
Boxfish	51,397	5,454	58,979	2,721	57,310	326	40,326	2,474	NA	1,401	95,683	5,129	
Goatfishes	5,215	0	9,656	717	6,459	0	6,812	280	NA	139	19,517	402	
Grunts	69,575	5,976	84,537	5,261	65,601	1,556	39,954	2,109	NA	3,603	202,662	5,587	
Jacks	104,498	48,788	88,385	49,962	67,589	26,669	35,528	31,469	NA	57,668	95,621	56,668	
Scups & Porgies	28,328	1,861	23,539	196	15,693	576	19,655	1,812	NA	1,653	27,488	2,863	
Spiny Lobster ²	329,227	--	322,992	--	289,609	--	274,318	--	NA	--	364,355	--	
Squirrelfish	19,430	15,460	10,385	1,107	8,405	840	6,732	754	NA	370	18,514	4,323	
Surgeonfish	0	122	0	60	0	0	0	0	NA	0	9,572	4,786	
Triggerfish & Filefish	55,361	62,525	47,194	17,721	45,650	6,168	50,714	1,970	NA	13,005	64,972	24,365	
Wrasses	54,980	26,404	67,187	11,737	59,427	10,122	53,623	5,539	NA	3,237	60,163	5,611	

¹ Commercial landings for Puerto Rico 2012 were not available (NA) at the time of preparation of this amendment, therefore were not included in this analysis.

² Recreational landings for spiny lobster are not monitored, therefore are not available.

Table 2.2.1.1.4. St. Croix and St. Thomas/St. John commercial landings in pounds (lbs) for the most recent five years of available information (2008-2012) and individual OFLs for 2011 stocks. Landings include harvest in both federal and state waters.

FMU	U.S. Virgin Islands (St. Croix (STX) and St. Thomas/St. John (STT/STJ))											
	2008		2009		2010		2011		2012		OFL (lbs)	
	STX	STT/ STJ	STX	STT/ STJ	STX	STT/ STJ	STX	STT/ STJ	STX	STT/ STJ	STX	STT/ STJ
Angelfish	63	8,365	99	9,077	815	10,586	8,510	18,337	14,253	16,047	406	10,529
Boxfish	8,268	33,008	7,418	30,323	4,302	25,813	5,335	15,757	1,819	12,288	9,370	30,978
Goatfishes	1,775	74	2,678	94	541	52	712	17	529	1	4,184	356
Grunts	39,836	39,144	46,789	36,557	32,514	38,407	34,418	25,402	24,761	16,102	40,979	41,797
Jacks	8,715	56,197	11,881	68,478	12,358	46,043	10,341	35,049	8,355	45,523	17,210	58,785
Scups & Porgies	5,694	22,287	4,249	21,603	5,189	20,387	2,698	8,498	146	144	5,153	24,243
Spiny Lobster	148,003	110,465	149,908	115,762	139,685	114,577	109,751	84,302	86,917	83,138	119,230	115,777
Squirrelfish	77	3,792	32	3,045	7	2,366	2,768	6,510	3,834	9,805	134	4,712
Surgeonfish	38,127	37,407	37,274	31,718	29,645	31,927	32,187	19,294	21,231	15,078	44,804	38,999
Triggerfish & Filefish	32,698	84,131	38,735	79,469	30,711	79,555	26,464	57,067	22,644	45,989	27,755	82,719
Wrasses	0	685	0	1,359	0	2,517	49	1,959	24	1,823	8	650

¹ U. S. Virgin Islands high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011.

Table 2.2.1.1.5. Caribbean-wide landings for the most recent five years of available information for the tilefish and aquarium trade species FMUs and corresponding Caribbean-wide OFL.

FMU	2008	2009	2010	2011	2012	OFL
Tilefish	0	0	2,591	122	231	16,269
Aquarium Trade Sps.	1,057	1,199	1,224	1,499	1,469	10,873

All of the units listed in Table 2.2.1.6 below that exceeded their OFL between 2008 and 2010 were classified as status ‘unknown’ at the Caribbean-wide level in previous Status of the U.S. Fisheries reports until the 2012 4th Quarter Update. In this update, the status of those units was changed to ‘not subject to overfishing’, except for angelfish, squirrelfish, and wrasses which remained classified as status ‘unknown’. Landings for the Jacks FMU in the Puerto Rico recreational sector show that the unit may have exceeded its OFL in 2012. These landings would

be analyzed to determine if the exceedance is due to an actual increase in landings or due to enhanced reporting. This information will be updated when available.

Table 2.2.1.1.6. Fishery management units from 2010 and 2011 stocks that exceeded their OFLs based on annual landings for the past 5 years (2008 to 2012). Landings include harvest in both federal and state waters. 2012 commercial landings for Puerto Rico were not complete at the time of preparation of this Public Hearing Draft/Environmental Assessment, thus were not included.

Region	Sector	Fishery Management Unit(s)	Year(s) Landings Exceeded OFL
Puerto Rico	Commercial	Jacks, Porgies, and Squirrelfish	2008
Puerto Rico	Commercial	Wrasse	2009
Puerto Rico	Recreational	Boxfish, Grunts, Squirrelfish, and Trigger & Filefish	2008
Puerto Rico	Recreational	Goatfish	2009
Puerto Rico	Recreational	Jacks	2012
Puerto Rico	Recreational	Wrasse	2008, 2009, and 2010
St. Croix	Commercial	Angelfish ¹	2010, 2011, and 2012
St. Croix	Commercial	Grunts	2009
St. Croix	Commercial	Porgies	2008 and 2010
St. Croix	Commercial	Spiny Lobster and Triggerfish & Filefish	2008, 2009, and 2010
St. Croix	Commercial	Squirrelfish ¹ and Wrasse ¹	2011 and 2012
St. Thomas/St. John	Commercial	Boxfish and Trigger & Filefish	2008
St. Thomas/St. John	Commercial	Jacks	2009
St. Thomas/St. John	Commercial	Squirrelfish ¹	2011 and 2012
St. Thomas/St. John	Commercial	Angelfish ¹	2010, 2011, and 2012
St. Thomas/St. John	Commercial	Wrasse ¹	2008 to 2012

¹ U. S. Virgin Islands high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011.

B. Comparison among the ACLs in Alternatives 1-3 under different status scenarios for each Council FMU.

The following analysis compares the ACLs in **Alternatives 1, 2 and 3** under the different overfishing status scenarios for species addressed in the 2010 Caribbean ACL Amendment (2010 stocks) and species addressed in the 2011 Caribbean ACL Amendment (2011 stocks).

‘Subject to overfishing’ Status

2010 STOCKS

Alternative 2 under a ‘subject to overfishing’ scenario would not change the current ACL of most 2010 stocks, except for queen conch, because the current ACL for these units was already derived from a 15% buffer reduction to the ABC or the OFL. After the 15% buffer reduction is applied, the queen conch ACL in St. Croix would be reduced by 7,500 pounds (Table 2.2.1.1.7).

Preferred Alternative 3 and Preferred Sub-alternatives 3a and 3d

The resulting ACLs from the ACL Control Rule as proposed in **Preferred Alternative 3** would be the same as in **Alternative 2** for all managed species, except for those units in **Preferred Sub-alternatives 3a-3e**. The Council can choose any or all sub-alternatives. Under either the ‘subject to overfishing’ or ‘not subject to overfishing’ and ‘unknown’ status, the ACLs for parrotfish and queen conch, (**Preferred Sub-alternatives 3a and 3d**) would remain as status quo.

Table 2.2.1.1.7. Current ACLs (**Alternative 1**) and new ACLs for 2010 stocks per island/island region and sector under **Alternative 2** and **Preferred Alternative 3** (including **Sub-alternatives 3a and 3d**) if stocks are determined to be ‘subject to overfishing’. Current ACLs are based on a 15% reduction (0.85 buffer) to the OFL or ABC, except for queen conch, which had no reduction applied to its ABC. New ACLs resulting from **Alternative 2** and **Preferred Alternative 3** (except for **Preferred Sub-alternatives 3a and 3d**) would be based on a 15% reduction (0.85 buffer) to the OFL or ABC (if determined). All values are in pounds (lbs).

Puerto Rico	Alternative 1		Alternative 2				Preferred Alternative 3			
	Current ACLs (lbs) (Alt. 1)		ACLs (lbs) if Subject to Overfishing under Alt. 2 (0.85 reduction)		Difference (in lbs) between Alt. 1 (status quo) and Alt. 2		ACLs (lbs) if Subject to Overfishing under Alt. 3 (0.85 reduction), including Sub-alt. 3a-3e		Difference (in lbs) between Alt. 1 (status quo) and Alt. 3	
	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec
Snapper Unit 1	284,685	95,526	284,685	95,526	No change		284,685	95,526	No change	

Snapper Unit 2	145,916	34,810	145,916	34,810	No change	145,916	34,810	No change
Snapper Unit 3	345,775	83,158	345,775	83,158	No change	345,775	83,158	No change
Snapper Unit 4	373,295	28,509	373,295	28,509	No change	373,295	28,509	No change
Grouper	177,513	77,213	177,513	77,213	No change	177,513	77,213	No change
Parrotfish	52,737	15,263	52,737	15,263	No change	Sub-alt. 3a:		
						52,737	15,263	No change
Queen Conch ¹	0	0	0	0	No change	Sub-alt. 3d:		
						0	0	No change
St. Croix	Alternative 1		Alternative 2			Preferred Alternative 3		
	Current ACLs (lbs) (Alt. 1)	ACLs (lbs) if Subject to Overfishing under Alt. 2 (0.85 reduction)	Difference (in lbs) between Alt. 1 (status quo) and Alt. 2			ACLs (lbs) if Subject to Overfishing under Alt. 3 (0.85 reduction), including Sub-alt. 3a-3e	Difference (in lbs) between Alt. 1 (status quo) and Alt. 3	
Snapper	102,946	102,946	No change			102,946	No change	
Grouper	30,435	30,435	No change			30,435	No change	
Parrotfish ^{1,2}	240,000	240,000	No change			Sub-alt. 3a:		
						240,000	No change	
Queen conch	50,000	42,500	- 7,500			Sub-alt 3d:		
						50,000	No change	
St. Thomas/St. John								
Snapper	133,775	133,775	No change			133,775	No change	
Grouper	51,849	51,849	No change			51,849	No change	
Parrotfish ^{1,2}	42,500	42,500	No change			Sub-alt. 3a:		
						42,500	No change	
Queen Conch ¹	0	0	No change			Sub-alt 3d:		
						0	No change	

¹ Reductions, if any, were made from ABC.

² The St. Croix Parrotfish ACL is further reduced by 5.8822% as specified in the 2010 Caribbean ACL Amendment.

2011 STOCKS

A 'subject to overfishing scenario' under **Alternative 2** would reduce the current ACL for most 2011 stocks (Table 2.2.1.1.8) because the current ACL for most of these units was based on a 10% reduction to the ABC and the new buffer will reduce the ABC by 15%. For the angelfish and the surgeonfish FMUs for each island and sector, and for the aquarium trade species FMU at the Caribbean-wide level, **Alternative 2** would translate into an increase in the allowed harvest under both 'subject to overfishing' / 'not subject to overfishing' or 'unknown' potential scenarios because the ACLs for these units were previously based on a 25% reduction to the ABC.

Preferred Alternative 3 and Sub-alternatives 3b, 3c, and 3e

The resulting ACLs from the ACL Control Rule as proposed in **Preferred Alternative 3** would be the same as in **Alternative 2** for all managed species, except for those units in **Preferred Sub-alternatives 3a-3e**. The Council can choose any or all sub-alternatives. Under either the ‘subject to overfishing’ or ‘not subject to overfishing’ and ‘unknown’ status, the ACLs for surgeonfish, angelfish, and aquarium trade species FMUs (**Preferred Sub-alternatives 3b, 3c, and 3e**, respectively) would remain as status quo.

Table 2.2.1.1.8. Current ACLs (**Alternative 1**) and new ACLs for 2011 stocks per island/island region and sector under **Alternative 2** and **Preferred Alternative 3** (including **Sub-alternatives 3b, 3c, and 3e**) if stocks are determined to be ‘subject to overfishing’. Current ACLs are based on a 10% reduction (0.90 buffer) to the ABC, except for angelfish, surgeonfish, and aquarium trade species, which had a 25% (0.75 buffer) reduction applied to the ABC. New ACLs for all except units in **Sub-alternatives 3b, 3c, and 3d**, would be based on a 15% reduction (0.85 buffer) to the ABC. All values are in pounds (lbs). Table A shows values for Puerto Rico, Table B shows values for the USVI, and Table C shows values for Caribbean-wide FMUs.

A. Puerto Rico

Puerto Rico	Alternative 1		Alternative 2				Preferred Alternative 3			
	Current ACLs (lbs) (Alt. 1)		ACLs (lbs) if Subject to Overfishing under Alt. 2 (0.85 reduction)		Difference (in lbs) between Alt. 1 (status quo) and Alt. 2		ACLs (lbs) if Subject to Overfishing under Alt. 3 (0.85 reduction), including Sub-alt. 3a-3e		Difference (in lbs) between Alt. 1 (status quo) and Alt. 3	
	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec
Boxfish	86,115	4,616	81,331	4,360	-4,784	-256	81,331	4,360	-4,784	-256
Goatfish	17,565	362	16,589	342	-976	-20	16,589	342	-976	-20
Grunts	182,396	5,028	171,923	4,749	-10,473	-279	171,923	4,749	-10,473	-279
Wrasses	54,147	5,050	51,139	4,769	-3,008	-281	51,139	4,769	-3,008	-281
Jacks	86,059	51,001	81,278	48,168	-4,781	-2,833	81,278	48,168	-4,781	-2,833
Scups & Porgies	24,739	2,577	23,365	2,434	-1,374	-143	23,365	2,434	-1,374	-143
Squirrelfish	16,663	3,891	15,737	3,675	-926	-216	15,737	3,675	-926	-216
Triggerfish & Filefish	58,475	21,929	55,226	20,710	-3,249	-1,219	55,226	20,710	-3,249	-1,219
Angelfish	8,984	4,492	10,181	5,091	1,197	599	Sub-alt. 3c			
							8,984	4,492	No change	
Surgeonfish	7,179	3,590	8,136	4,068	957	478	Sub-alt. 3b			
							7,179	3,590	No change	
Spiny Lobster	327,920		309,702		-18,218		309,702		-18,218	

¹ Commercial and recreational ACL is a single value for Spiny lobster in Puerto Rico

B. USVI

St. Croix	Alternative 1	Alternative 2		Preferred Alternative 3	
	Current ACLs (lbs) (Alt. 1)	ACLs (lbs) if Subject to Overfishing under Alt. 2 (0.85 reduction)	Difference (in lbs) between Alt. 1 (status quo) and Alt. 2	ACLs (lbs) if Subject to Overfishing under Alt. 3 (0.85 reduction), including Sub-alts. 3a-3e	Difference (in lbs) between Alt. 1 (status quo) and Alt. 3
Boxfish	8,433	7,965	-468	7,965	-468
Goatfish	3,766	3,557	-209	3,557	-209
Grunts	36,881	34,832	-2,049	34,832	-2,049
Wrasses	7	7	0	7	0
Jacks	15,489	14,629	-860	14,629	-860
Scups & Porgies	4,638	4,380	-258	4,380	-258
Squirrelfish	121	114	-7	114	-7
Triggerfish & Filefish	24,980	23,593	-1,387	23,593	-1,387
Angelfish	305	345	40	Sub-alt. 3c	
				305	No change
Surgeonfish	33,603	38,083	4,480	Sub-alt. 3b	
				33,603	No change
Spiny Lobster	107,307	101,346	-5,961	101,346	-5,961
St. Thomas/St. John					
Boxfish	27,880	26,331	-1,549	26,331	-1,549
Goatfish	320	302	-18	302	-18
Grunts	37,617	35,527	-2,090	35,527	-2,090
Wrasses	585	553	-32	553	-32
Jacks	52,907	49,967	-2,940	49,967	-2,940
Scups & Porgies	21,819	20,607	-1,212	20,607	-1,212
Squirrelfish	4,241	4,005	-236	4,005	-236
Triggerfish & Filefish	74,447	70,311	-4,136	70,311	-4,136
Angelfish	7,897	8,950	1,053	Sub-alt. 3c	
				7,897	No change
Surgeonfish	29,249	33,149	3,900	Sub-alt. 3b	
				29,249	No change
Spiny Lobster	104,199	98,410	-5,789	98,410	-5,789

C. Caribbean-wide

Caribbean Wide	Current ACLs (lbs) (Alt. 1)	ACLs (lbs) if Subject to Overfishing under Alt. 2 (0.85 reduction)	Difference (in lbs) between Alt. 1 (status quo) and Alt. 2	ACLs (lbs) if Subject to Overfishing under Alt. 3 (0.85 reduction), including Sub-alts. 3a-3e	Difference (in lbs) between Alt. 1 (status quo) and Alt. 3
Tilefish	14,642	13,829	- 813	13,829	- 813
Aquarium Trade Sps.	8,155	9,242	1,087	Sub-alt. 3e	
				8,155	No change

‘Not Subject to Overfishing’ and ‘Unknown’ Status

2010 STOCKS

Alternative 2

A ‘not subject to overfishing’ or ‘unknown’ status scenario under **Alternative 2** would change the current ACL for all 2010 stocks. **Alternative 2** would increase the allowed harvest for parrotfish, snapper, and grouper in Puerto Rico (commercial and recreational), St. Croix, and St. Thomas/St. John because the current ACL for these units was derived from a 15% buffer reduction to the ABC or the OFL. A ‘not subject to overfishing’ or ‘unknown’ status would change the reduction applied to the buffer to 10%. For the queen conch, under **Alternative 2**, ‘not subject to overfishing’ status would reduce the ACL in St. Croix by 5,000 pounds because the current ACL established in the 2010 Caribbean ACL Amendment did not have a reduction applied (Table 2.2.1.1.9). The annual catch limit for queen conch in Puerto Rico and in St. Thomas/St. John would remain at zero.

Preferred Alternative 3 and Preferred Sub-alternatives 3a-3e

The resulting ACLs from the ACL Control Rule as proposed in **Preferred Alternative 3** would be the same as in **Alternative 2** for all managed species, except for those units in **Preferred Sub-alternatives 3a-3e**. The Council can choose any or all sub-alternatives. Under any of the ‘subject to overfishing’ or ‘not subject to overfishing’ and ‘unknown’ status, the ACLs for parrotfish and queen conch (**Preferred Sub-alternatives 3a and 3d**) will remain as status quo (Table 2.2.1.1.9).

Table 2.2.1.1.9. Current ACLs (**Alternative 1**) and new ACLs for 2010 stocks per island and sector under **Alternative 2** and **Preferred Alternative 3** (including **Sub-alternatives 3a-3e**) if stocks are determined not to be subject to overfishing. Current ACLs are based on 15% reduction (0.85 buffer) to the OFL or ABC (parrotfish). Queen conch had no reduction applied. New ACLs for most units would be based on a 10% reduction (0.90 buffer) to the OFL or ABC (if determined), except for units in **Sub-alternatives 3a** and **3d**. All values are in pounds (lbs). Table A shows values for Puerto Rico; Table B shows values for St. Croix, and Table C shows values for St. Thomas/St. John.

Table A.

Puerto Rico	Alternative 1		Alternative 2				Preferred Alternative 3			
	Current ACLs (lbs) (Alt. 1)		ACLs (lbs) if Not Subject to Overfishing under Alt. 2 (0.90 reduction)		Difference (in lbs) between Alt. 1 (status quo) and Alt. 2		ACLs (lbs) if Not Subject to Overfishing under Alt. 3 (0.90 reduction), including Sub-alt. 3a-3e		Difference (in lbs) between Alt. 1 (status quo) and Alt. 3	
	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec
Snapper Unit 1	284,685	95,526	301,431	101,146	16,746	5,620	301,431	101,146	16,746	5,620
Snapper Unit 2	145,916	34,810	154,499	36,858	8,583	2,048	154,499	36,858	8,583	2,048
Snapper Unit 3	345,775	83,158	366,115	88,050	20,340	4,892	366,115	88,050	20,340	4,892
Snapper Unit 4	373,295	28,509	395,254	30,186	21,959	1,677	395,254	30,186	21,959	1,677
Grouper	177,513	77,213	187,955	81,755	10,442	4,542	187,955	81,755	10,442	4,542
Parrotfish ¹	52,737	15,263	55,836	16,164	3,099	901	Sub-alt. 3a:			
							52,737	15,263	No change	
Queen Conch	0	0	0	0	0	0	Sub-alt 3d:			
							0	0	No change	

Table B.

St. Croix	Alternative 1		Alternative 2		Preferred Alternative 3	
	Current ACLs (lbs) (Alt. 1)		ACLs (lbs) if Not Subject to Overfishing under Alt. 2 (0.90 reduction)		ACLs (lbs) if Not Subject to Overfishing under Alt. 3 (0.90 reduction), including Sub-alt. 3a-3e	
			Difference (in lbs) between Alt. 1 (status quo) and Alt. 2		Difference (in lbs) between Alt. 1 (status quo) and Alt. 3	
Snapper	102,946	109,002	6,056	109,002	6,056	
Grouper	30,435	32,225	1,790	32,225	1,790	
Parrotfish ^{1,2}	240,000	254,118	14,118	Sub-Alt. 3a		
				240,000	No change	
Queen conch ¹	50,000	45,000	- 5,000	Sub-Alt 3d		
				50,000	No change	

Table C.

St. Thomas/ St. John	Alternative 1	Alternative 2		Preferred Alternative 3	
	Current ACLs (lbs) (Alt. 1)	ACLs (lbs) if Not Subject to Overfishing under Alt. 2 (0.90 reduction)	Difference (in lbs) between Alt. 1 (status quo) and Alt. 2	ACLs (lbs) if Not Subject to Overfishing under Alt. 3 (0.90 reduction), including Sub-alts. 3a-3e	Difference (in lbs) between Alt. 1 (status quo) and Alt. 3
Snapper	133,775	141,644	7,869	141,644	7,869
Grouper	51,849	54,899	3,050	54,899	3,050
Parrotfish ¹	42,500	45,000	2,500	Sub-alt. 3a	
				42,500	No change
Queen Conch	0	0	0	Sub-alt. 3d	
				0	No change

¹ Buffer reductions, if any, were made from ABC.

² The St. Croix Parrotfish ACL is further reduced by 5.8822% as specified in the 2010 Caribbean ACL Amendment.

2011 Stocks

Alternative 2

For 2011 stocks, a ‘not subject to overfishing’ or ‘unknown’ scenario under **Alternative 2** would not change the current ACLs for most of these stocks, except for surgeonfish, angelfish, and aquarium trade species, because the ACLs for most 2011 stocks were already derived from a 10% buffer reduction to the ABC in the 2011 Caribbean ACL Amendment (Table 2.2.1.1.10).

For the angelfish and the surgeonfish FMUs for each island and sector, as well as for the aquarium trade species FMU at the Caribbean-wide level, **Alternative 2** would translate into an increase in the allowed harvest under both ‘subject to overfishing’ and ‘not subject to overfishing’ scenarios.

Preferred Alternative 3 and Preferred Sub-alternatives 3a-3e

The resulting ACLs from the ACL Control Rule as proposed in **Preferred Alternative 3** would be the same as in **Alternative 2** for all managed species, except for those units in **Preferred Sub-alternatives 3a-3e**. The Council can choose any or all sub-alternatives. Under either the ‘subject to overfishing’ or ‘not subject to overfishing’ and ‘unknown’ status, the ACLs for surgeonfish, angelfish, and aquarium trade species (**Preferred Sub-alternatives 3b, 3c, and 3d**) will remain as status quo (Table 2.2.1.1.10).

Table 2.2.1.1.10. Current ACLs (**Alternative 1**) and new ACLs for 2011 stocks per island and sector under **Alternative 2** and **Preferred Alternative 3** (including **Sub-alternatives 3a-3e**) if stocks are determined to be ‘not subject to overfishing’ or status ‘unknown’. Current ACLs are based on a 10% reduction (0.90 buffer) to the ABC, except for angelfish, surgeonfish, and aquarium trade species units, which had a 25% (0.75 buffer) reduction applied to the ABC. New ACLs would be based on a 10% reduction (0.90 buffer) to the ABC for all except **Preferred Sub-alternatives 3b, 3c, and 3e**. All values are in pounds (lbs). Table A shows Puerto Rico values, Table B shows USVI values, and Table C shows Caribbean-wide values.

Table A.

Puerto Rico	Alternative 1		Alternative 2				Preferred Alternative 3			
	Current ACLs (lbs) (Alt. 1)		ACLs (lbs) if Not Subject to Overfishing under Alt. 2 (0.90 reduction)		Difference (lbs) between Alt. 1 (status quo) and Alt. 2		ACLs (lbs) if Not Subject to Overfishing under Alt. 3 (0.90 reduction), including Sub-alt. 3a-3e		Difference (lbs) between Alt. 1 (status quo) and Alt. 3	
	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec	Comm	Rec
Boxfish	86,115	4,616	86,115	4,616	No change		86,115	4,616	No change	
Goatfish	17,565	362	17,565	362	No change		17,565	362	No change	
Grunts	182,396	5,028	182,396	5,028	No change		182,396	5,028	No change	
Wrasses	54,147	5,050	54,147	5,050	No change		54,147	5,050	No change	
Jacks	86,059	51,001	86,059	51,001	No change		86,059	51,001	No change	
Scups & Porgies	24,739	2,577	24,739	2,577	No change		24,739	2,577	No change	
Squirrelfish	16,663	3,891	16,663	3,891	No change		16,663	3,891	No change	
Triggerfish & Filefish	58,475	21,929	58,475	21,929	No change		58,475	21,929	No change	
Angelfish	8,984	4,492	10,780	5,390	1,796	898	Sub-alt 3c:			
							8,984	4,492	No change	
Surgeonfish	7,179	3,590	8,615	4,307	1,436	717	Sub-alt 3b:			
							7,179	3,590	No change	
Spiny Lobster ¹	327,920		327,920		No change		327,920		No change	

¹ Commercial and recreational ACL is a single value for Spiny lobster in Puerto Rico

Table B.

St. Croix	Alternative 1	Alternative 2		Preferred Alternative 3	
	Current ACLs (lbs) (Alt. 1)	ACLs (lbs) if Not Subject to Overfishing under Alt. 2 (0.90 reduction)	Difference (lbs) between Alt. 1 (status quo) and Alt. 2	ACLs (lbs) if Not Subject to Overfishing under Alt. 3 (0.90 reduction), including Sub-alt. 3a-3e	Difference (lbs) between Alt. 1 (status quo) and Alt. 3
Boxfish	8,433	8,433	No change	8,433	No change
Goatfish	3,766	3,766	No change	3,766	No change
Grunts	36,881	36,881	No change	36,881	No change
Wrasses	7	7	No change	7	No change
Jacks	15,489	15,489	No change	15,489	No change
Scups & Porgies	4,638	4,638	No change	4,638	No change
Squirrelfish	121	121	No change	121	No change
Triggerfish & Filefish	24,980	24,980	No change	24,980	No change
Angelfish	305	365	60	Sub-alt 3c:	
				305	No change
Surgeonfish	33,603	40,324	6,721	Sub-alt 3b:	
				33,603	No change
Spiny Lobster	107,307	107,307	No change	107,307	No change
St. Thomas/St. John					
Boxfish	27,880	27,880	No change	27,880	No change
Goatfish	320	320	No change	320	No change
Grunts	37,617	37,617	No change	37,617	No change
Wrasses	585	585	No change	585	No change
Jacks	52,907	52,907	No change	52,907	No change
Scups & Porgies	21,819	21,819	No change	21,819	No change
Squirrelfish	4,241	4,241	No change	4,241	No change
Triggerfish & Filefish	74,447	74,447	No change	74,447	No change
Angelfish	7,897	9,476	1,579	Sub-alt 3c:	
				7,897	No change
Surgeonfish	29,249	35,099	5,850	Sub-alt 3b:	
				29,249	No change
Spiny Lobster	104,199	104,199	No change	104,199	No change

Table C.

Caribbean Wide	Alternative 1	Alternative 2		Preferred Alternative 3	
	Current ACLs (lbs) (Alt. 1)	ACLs (lbs) if Not Subject to Overfishing under Alt. 2 (0.90 reduction)	Difference (lbs) between Alt. 1 (status quo) and Alt. 2	ACLs (lbs) if Not Subject to Overfishing under Alt. 3 (0.90 reduction), including Sub-alt. 3a-3e	Difference (lbs) between Alt. 1 (status quo) and Alt. 3
Tilefish	14,642	14,642	No change	14,642	No change
Aquarium Trade Sps.	8,155	9,786	1,631	Sub-alt. 3e:	
				8,155	No change

C. Comparison between Recent Landings and the ACLs in Alternatives 1 through 3

Alternative 1

The impact of **Alternative 1** was analyzed by comparing recent landings to the ACLs. Annual Caribbean landings have potential to change due to late reporting. Therefore, an annual landings summary can change because of the time the landings were extracted. To be consistent with past regulations, we used the same landings datasets previously used to determine the 2013 and 2014 accountability measure (AM)-based closures in the U.S. Caribbean EEZ. There are two different landings datasets, one used for the 2013 AM-based closures, and one used for the 2014 AM-based closures. The landings extraction from the SEFSC in January, 2013 was used to determine the 2013 AM-based closures (SERO-LAPP-2013-01). The landings extraction from the SEFSC on October, 2013 was used to determine the 2014 AM-based closures (SERO-LAPP-2013-09).

As discussed in Section 1.6, Caribbean ACLs are monitored using a three-year running average to determine ACL overages for a particular year. However, 2010 stocks are governed by the three-year running average beginning in 2010, and 2011 stocks are governed by the three-year running average beginning in 2011. Also note that, because only 1 or 2 years of data were available for developing landings estimates in the first two years of this process, less than three years of data were used to conduct ACL comparisons for identifying needed 2013 fishing season closures (2010 and 2011 stocks) and 2014 fishing season closures (2011 stocks only). Thus, the ACLs stated in **Alternative 1** (current ACLs, Table 2.2.1.1.7) for 2010 stocks were compared against an average of 2010-2011 annual landings generated from the January 2013 dataset, and to an average of 2010-2012 annual landings generated from the October 2013 dataset (Table 2.2.1.1.11). The ACLs stated in **Alternative 1** for the 2011 stocks (current ACLs, Table 2.2.1.1.8) were compared against 2011 annual landings generated from the January 2013 dataset, and to an average of 2011-2012 annual landings generated from the October 2013 dataset (Table 2.2.1.1.12). Landings for queen conch in Puerto Rico and St. Thomas/St. John were not included in this analysis because federal harvest of queen conch is currently prohibited in these regions. Also, the October 2013 dataset did not have complete 2012 Puerto Rico commercial landings;

therefore, only 2010-2011 annual landings were used to calculate Puerto Rico commercial averages using the October 2013 landings dataset.

Table 2.2.1.1.11. Stocks addressed in the 2010 Caribbean ACL Amendment (2010 stocks) that exceeded their ACL under **Alternative 1** and the number of pounds over the ACL. The ACLs were compared against an average of 2010-2011 annual landings generated from the January 2013 dataset, and an average of 2010-2012 annual landings generated from the October 2013 dataset (2010-2011 only for Puerto Rico commercial stocks using the October 2013 dataset-see text).

Region	Sector	FMU	Year(s) Landings Exceeded ACL	Pounds Over
Puerto Rico	Commercial	Snapper Unit 2	2010-2011 Average	132,063
St. Croix	Commercial	Queen Conch	2010-2011 Average	17,530
St. Croix	Commercial	Queen Conch	2010-2012 Average	7,299
St. Thomas/St. John	Commercial	Grouper	2010-2011 Average	4,984

Table 2.2.1.1.12. Stocks addressed in the 2011 Caribbean ACL Amendment (2011 stocks) that exceeded their ACL under **Alternative 1** and the number of pounds over the ACL. The ACLs were compared against 2011 annual landings generated from the January 2013 dataset, and to an average of 2011-2012 annual landings generated from the October 2013 dataset (2011 only for Puerto Rico commercial stocks using the October 2013 dataset - see text).

Region	Sector	FMU	Year(s) Landings Exceeded ACL	Pounds Over
Puerto Rico	Recreational	Wrasses	2011	489
St. Croix	Commercial	Angelfish ¹	2011	8,196
St. Croix	Commercial	Angelfish ¹	2011-2012 Average	11,077
St. Croix	Commercial	Squirrelfish ¹	2011-2012 Average	3,180
St. Croix	Commercial	Wrasses ¹	2011-2012 Average	30
St. Croix	Commercial	Spiny Lobster	2011	2,401
St. Croix	Commercial	Squirrelfish ¹	2011	2,647
St. Croix	Commercial	Triggerfish & Filefish	2011	1,473
St. Croix	Commercial	Wrasses ¹	2011	42
St. Thomas/St. John	Commercial	Angelfish ¹	2011	10,436
St. Thomas/St. John	Commercial	Angelfish ¹	2011-2012 Average	9,295
St. Thomas/St. John	Commercial	Squirrelfish ¹	2011	2,257
St. Thomas/St. John	Commercial	Squirrelfish ¹	2011-2012 Average	3,917
St. Thomas/St. John	Commercial	Wrasses ¹	2011	1,374
St. Thomas/St. John	Commercial	Wrasses ¹	2011-2012 Average	1,306

¹ U. S. Virgin Islands high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011.

Based on the information presented in Tables 2.2.1.1.11 and 2.2.1.1.12, the 2010 stock complexes Snapper Unit 2 (SU2) (commercial) in Puerto Rico, queen conch in St. Croix, and Grouper in St. Thomas/St. John exceeded their ACLs when compared to the 2010-2011 average under **Alternative 1**, which is the status quo. Accountability measures were applied for those units during the year 2013, except for queen conch because AMs do not apply for this species. When ACLs were compared to the 2010-2012 average of landings, only queen conch exceeded the ACL, but these AMs do not apply to queen conch. It is important to note that the 2014 closure determinations are preliminary because the commercial data for 2012 Puerto Rico are still pending.

For 2011 stocks, Puerto Rico wrasses (recreational), St. Croix angelfish, spiny lobster, squirrelfish, triggerfish and filefish, and wrasses, and St. Thomas/St. John angelfish, squirrelfish, and wrasses exceeded their corresponding ACL when compared against landings for those units for the year 2011 (Table 2.2.1.1.12). St. Croix and St. Thomas/St. John high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011. Therefore no AMs were applied to these groups. Accountability measures were implemented for the rest of these groups in 2013 (i.e., wrasses Puerto Rico recreational sector, triggerfish and filefish St. Croix, spiny lobster St. Croix, and groupers St. Thomas/St. John).

When ACLs were compared to the 2011-2012 average of landings, angelfish, squirrelfish, and wrasses FMUs in St. Croix and in St. Thomas/St. John exceeded their corresponding ACL under **Alternative 1** (current ACL). However, as determined for the year 2011, St. Croix and St. Thomas/St. John high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011. Therefore no AMs would be applied to these groups in 2014. Because Puerto Rico commercial data is still not available, these determinations regarding AM closures are still preliminary. Fourteen (22%) out of the 64 FMUs had landings that exceeded the **Alternative 1** ACLs. This analysis compares the ACLs for each FMU to landings from two different datasets. Therefore, there is potential for each FMU's ACL to be exceeded more than once. The total number of times an **Alternative 1** ACL was exceeded is 19 (17%) of the potential 111 ACL comparisons.

Alternative 2

Landings were compared to the ACLs using the same method as **Alternative 1** above. However, the analysis for **Alternative 2** provides ACLs for two potential scenarios. Scenario 1 uses the ACLs resulting from applying the buffer reduction to the OFL or ABC if the FMUs were determined to be 'subject to overfishing' (ACLs are provided in Tables 2.2.1.7 and 2.2.1.8). Scenario 2 uses the ACLs resulting from applying the new buffer reduction to the OFL or ABC

if the stocks were determined to be ‘not subject to overfishing’ or status ‘unknown’ (Tables 2.2.1.9 and 2.2.1.10).

If the FMU is determined to be ‘subject to overfishing’ under Alternative 2

Thirteen (20%) out of the 64 FMUs had landings that exceeded the **Alternative 2** ACLs at least once when the ACL was set to 85% of the OFL or ABC. Table 2.2.1.1.13 provides the results for stocks addressed in the 2010 Caribbean ACL Amendment (2010 stocks) and Table 2.2.1.1.14 provides the results for stocks addressed in the 2011 Caribbean ACL Amendment (2011 stocks). The ACLs for each FMU are compared to landings from two different data sets, therefore, there is potential for each FMU’s ACL to be exceeded more than once. The total number of times an **Alternative 2** ACL was exceeded assuming the FMU is ‘subject to overfishing’ is 20 (18%) of the potential 111 ACL comparisons.

Table 2.2.1.1.13. Stocks addressed in the 2010 Caribbean ACL Amendment (2010 stocks) that exceeded their ACL in **Alternative 2** under a ‘subject to overfishing’ status scenario and the pounds over the ACL. The ACLs were compared against an average of 2010-2011 annual landings generated from the January 2013 dataset, and an average of 2010-2012 generated from the October 2013 dataset (Puerto Rico commercial data not available for 2012).

Region	Sector	FMU	Year(s) Landings Exceeded ACL	Pounds Over
Puerto Rico	Commercial	Snapper Unit 2	2010-2011 Average	132,063
St. Croix	Commercial	Queen Conch	2010-2011 Average	25,030
St. Croix	Commercial	Queen Conch	2010-2012 Average	14,799
St. Thomas/St. John	Commercial	Grouper	2010-2011 Average	4,984

Table 2.2.1.1.14. Stocks addressed in the 2011 Caribbean ACL Amendment (2011 stocks) that exceeded their ACLs in **Alternative 2** under a ‘subject to overfishing’ status scenario and the number of pounds over the ACL. The ACLs were compared against 2011 annual landings generated from the January 2013 dataset, and an average of 2010-2012 annual landings generated from the October 2013 dataset (Puerto Rico commercial data not available for 2012).

Region	Sector	FMU	Year(s) Landings Exceeded ACL	Pounds Over
Puerto Rico	Commercial	Wrasses	2011	2,484
Puerto Rico	Recreational	Wrasses	2011	770
St. Croix	Commercial	Angelfish	2011	8,156
St. Croix	Commercial	Angelfish	2011-2012 Average	11,036

Region	Sector	FMU	Year(s) Landings Exceeded ACL	Pounds Over
St. Croix	Commercial	Spiny Lobster	2011	8,363
St. Croix	Commercial	Squirrelfish	2011	2,654
St. Croix	Commercial	Squirrelfish	2011-2012 Average	3,187
St. Croix	Commercial	Triggerfish & Filefish	2011	2,861
St. Croix	Commercial	Triggerfish & Filefish	2011-2012 Average	962
St. Croix	Commercial	Wrasses	2011	42
St. Croix	Commercial	Wrasses	2011-2012 Average	30
St. Thomas/St. John	Commercial	Angelfish	2011	9,383
St. Thomas/St. John	Commercial	Angelfish	2011-2012 Average	8,242
St. Thomas/St. John	Commercial	Squirrelfish	2011	2,493
St. Thomas/St. John	Commercial	Squirrelfish	2011-2012 Average	4,152
St. Thomas/St. John	Commercial	Wrasses	2011	1,407
St. Thomas/St. John	Commercial	Wrasses	2011-2012 Average	1,339

¹ U. S. Virgin Islands high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011.

Based on the information presented in Tables 2.2.1.1.13 and 2.2.1.1.14, when compared to the 2010-2011 average of landings, the same 2010 stock complexes that exceeded the ACL for these years under **Alternative 1** would have also exceeded the ACL under a ‘subject to overfishing’ scenario in **Alternative 2** (i.e., Snapper Unit 2 (SU2) in Puerto Rico, queen conch in St. Croix, and Grouper in St. Thomas/St. John). Under this potential scenario, AMs would need to be applied to those units, except for queen conch because AMs do not apply for this species. This result is expected because these units were previously determined to be ‘subject to overfishing’ (2010 Caribbean ACL Amendment) and the buffer applied to derive the current ACL for SU2 and grouper for all islands and sectors is the same as what would be applied under a ‘subject to overfishing’ scenario in **Alternative 2**. For the queen conch, although no buffer reduction was applied to derive the ACL under **Alternative 1**, the ACL was still exceeded and thus applying a buffer reduction to derive the new ACL in **Alternative 2** would cause the ACL to be exceeded as well. The only unit that exceeded the ACL when compared against 2010-2012 landings was queen conch in St. Croix, but AMs do not apply for this species. As mentioned above, Puerto Rico 2012 commercial landings are still pending so these results are preliminary.

For 2011 stocks, when the resulting ACLs under a ‘subject to overfishing’ scenario in **Alternative 2** are compared against 2011 landings, the same units that exceeded the ACL under **Alternative 1** (i.e., Puerto Rico wrasses (recreational), St. Croix angelfish, spiny lobster, squirrelfish, triggerfish and filefish, and wrasses, and St. Thomas/St. John angelfish, squirrelfish, and wrasses) in addition to the wrasses FMU in the Puerto Rico commercial sector, would have exceeded their corresponding ACL. For most of these units, the number of pounds exceeded in

Alternative 2 would be slightly higher than what was exceeded in **Alternative 1** because of the difference in the buffer reductions applied to the OFL or the ABC (15% vs 10%). The difference in the pounds exceeded for the angelfish FMU is actually slightly less than in **Alternative 1** because the buffer reduction that would be applied under **Alternative 2** (15%) is less conservative than the one applied in **Alternative 1** (25%). Similar to **Alternative 1**, St. Croix and St. Thomas/St. John high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011. Therefore no AMs would need to be applied to these groups. In theory, AMs would have to be applied for the rest of these groups unless high landings were also determined to be due to enhanced reporting.

When ACLs were compared to the 2011-2012 average of landings, the same units that exceeded the ACL under **Alternative 1** would have also exceeded the ACL in **Alternative 2** under a ‘subject to overfishing’ status scenario (i.e., angelfish, squirrelfish, and wrasses FMUs in St. Croix and in St. Thomas/St. John) with the addition of the triggerfish and filefish FMU in St. Croix. As discussed above in the comparison with 2011 landings, the number of pounds exceeded in **Alternative 2** would be slightly higher for most of these units than what was exceeded in **Alternative 1**. Again, the difference in the pounds exceeded for the angelfish FMU would be slightly less than in **Alternative 1**. St. Croix and St. Thomas/St. John high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011, and no AMs would need to be applied to these groups in 2014. For the triggerfish and filefish FMU in St. Croix, the new ACL that would result from **Alternative 2** under a ‘subject to overfishing’ scenario would have been exceeded and AMs would need to be applied for this unit in 2014 unless landings are determined to be due to enhanced reporting. Because Puerto Rico commercial data is still not available, these results regarding potential 2014 AM closures are still preliminary.

If the FMU is determined ‘not to be subject to overfishing’ or ‘unknown’ under Alternative 2

Twelve (19%) out of the 64 FMUs had landings that exceeded the **Alternative 2** ACLs at least once when the ACL was set to 90% of the OFL or ABC. Table 2.2.1.1.15 provides the results for 2010 stocks and Table 2.2.1.1.16 provides the results for 2011 stocks. This analysis compares the ACLs for each FMU to landings from two different datasets. Therefore, there is potential for each FMU’s ACL to be exceeded more than once. The total number of times an **Alternative 2** ACL was exceeded assuming the FMU is ‘not subject to overfishing’ is eighteen (16%) of the potential 111 ACL comparisons.

Table 2.2.1.1.15. Stocks addressed in the 2010 Caribbean ACL Amendment (2010 stocks) that exceeded their ACLs in **Alternative 2** under a ‘not subject to overfishing’ or ‘unknown’ status scenario and the number of pounds over the ACL. The ACLs were compared against an average of 2010-2011 annual landings generated from the January 2013 dataset, and an average of 2010-2012 generated from the October 2013 dataset (Puerto Rico commercial data not available for 2012).

Region	Sector	FMU	Year(s) Landings Exceeded ACL	Pounds Over
Puerto Rico	Commercial	Snapper Unit 2	2010-2011 Average	123,480
St. Croix	Commercial	Queen Conch	2010-2011 Average	22,530
St. Croix	Commercial	Queen Conch	2010-2012 Average	12,299
St. Thomas/St. John	Commercial	Grouper	2010-2011 Average	1,934

Table 2.2.1.1.16. Stocks addressed in the 2011 Caribbean ACL Amendment that exceeded their ACLs in **Alternative 2** under a ‘not subject to overfishing’ or ‘unknown’ status scenario and the number of pounds over the ACL. The ACLs were compared against 2011 annual landings generated from the January 2013 dataset, and an average of 2010-2012 annual landings generated from the October 2013 dataset (Puerto Rico commercial data not available for 2012).

Region	Sector	FMU	Year(s) Landings Exceeded ACL	Pounds Over
Puerto Rico	Recreational	Wrasses	2011	489
St. Croix	Commercial	Angelfish	2011	8,136
St. Croix	Commercial	Angelfish	2011-2012 Average	11,016
St. Croix	Commercial	Spiny Lobster	2011	2,401
St. Croix	Commercial	Squirrelfish	2011	2,647
St. Croix	Commercial	Squirrelfish	2011-2012 Average	3,180
St. Croix	Commercial	Triggerfish & Filefish	2011	1,474
St. Croix	Commercial	Wrasses	2011	42
St. Croix	Commercial	Wrasses	2011-2012 Average	30
St. Thomas/St. John	Commercial	Angelfish	2011	8,857
St. Thomas/St. John	Commercial	Angelfish	2011-2012 Average	7,716
St. Thomas/St. John	Commercial	Squirrelfish	2011	2,257
St. Thomas/St. John	Commercial	Squirrelfish	2011-2012 Average	3,917
St. Thomas/St. John	Commercial	Wrasses	2011	1,374
St. Thomas/St. John	Commercial	Wrasses	2011-2012 Average	1,306

¹ U. S. Virgin Islands high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011.

When the new ACLs for 2010 stocks resulting from **Alternative 2** under a ‘not subject to overfishing’ or status ‘unknown’ scenario are compared to an average of 2010-2011 annual landings, the same units that exceeded the ACL under a ‘subject to overfishing’ scenario in **Alternative 2** and **Alternative 1** would have also exceeded the ACL for those years (i.e., SU2 in Puerto Rico, queen conch in St. Croix, and grouper in St. Thomas/St. John). For SU2 in Puerto Rico commercial sector and grouper in St. Thomas/St. John, the number of pounds exceeded in **Alternative 2** under a ‘not subject to overfishing’ status would be slightly less than what was exceeded under **Alternative 2** under a ‘subject to overfishing’ scenario and under **Alternative 1**. For the queen conch, although no buffer reduction was applied to derive the ACL under **Alternative 1**, the ACL was still exceeded and thus applying a buffer reduction to derive the new ACL in **Alternative 2** would cause the ACL to be exceeded as well. Therefore, under this potential scenario, AMs would have to be applied for SU2 and grouper in the Puerto Rico recreational sector and St. Thomas, St. John, respectively, although not for queen conch because AMs do not apply for this species.

The only unit that exceeded the ACL when compared against 2010-2012 landings was queen conch FMU in St. Croix, but AMs do not apply for these species. As mentioned above Puerto Rico commercial landings are still pending and thus these results are preliminary.

When the new ACLs for 2011 stocks resulting from **Alternative 2** under a ‘not subject to overfishing’ or status ‘unknown’ scenario are compared to 2011 landings, the same units that exceeded the ACL in **Alternative 1** would have also exceeded their corresponding ACL (i.e., Puerto Rico wrasses (recreational), St. Croix angelfish, spiny lobster, squirrelfish, triggerfish and filefish, and wrasses, and St. Thomas/St. John angelfish, squirrelfish, and wrasses). For most of these units, the number of pounds exceeded under this scenario in **Alternative 2** would be similar to the pounds exceeded in **Alternative 1**. This is because these units were previously determined to not be subject to overfishing and the buffer reduction applied to derive the current ACL (**Alternative 1**) for all the units (islands and sectors) shown in Table 2.2.1.1.16, except for angelfish, is the same that would be applied in **Alternative 2** under this scenario (i.e. 10%). The number of pounds exceeded for the angelfish FMU is slightly less than the pounds exceeded in **Alternative 2** under a ‘subject to overfishing’ scenario and in **Alternative 1** because the buffer reduction that would be applied under a ‘not subject to overfishing’ status in **Alternative 2** (10%) is less conservative than the one applied in **Alternative 2** under the ‘subject to overfishing’ status (15%) and under **Alternative 1** (25%). Similar to **Alternative 1** and **Alternative 2** under a ‘subject to overfishing’ status, St. Croix and St. Thomas/St. John high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011. Therefore, no AMs would need to be applied to these groups. In theory, AMs would have to be applied for the rest of the groups (i.e., wrasses Puerto Rico recreational sector, triggerfish and filefish St. Croix, spiny lobster St. Croix, and groupers St. Thomas/St. John) unless high landings are also determined to be due to enhanced reporting.

When ACLs for 2011 stocks were compared to the 2011-2012 average of landings, the same units that exceeded the ACL under **Alternative 1** would have also exceeded the ACL in **Alternative 2** under a ‘not subject to overfishing’ status scenario (i.e., angelfish, squirrelfish, and wrasses FMUs in St. Croix and in St. Thomas/St. John). For the squirrelfish and wrasses FMUs in both St. Croix and St. Thomas/St. John, the number of pounds exceeded in **Alternative 2** under this scenario would be similar to the pounds exceeded during the same average of years in **Alternative 1**. As discussed above, this is because the current ACL for these units (**Alternative 1**) for all islands and sectors was also derived from a 10% reduction to the ABC. Also as discussed above for 2011 landings, the number of pounds exceeded for the angelfish FMU would be slightly less than the pounds exceeded in **Alternative 2** under a ‘subject to overfishing’ scenario and in **Alternative 1**. St. Croix and St. Thomas/St. John high landings of angelfish, squirrelfish, and wrasses were attributed to enhanced reporting resulting from modifications to the reporting forms that started in 2011 and no AMs would need to be triggered for these units.

No other units exceeded the ACL when compared against 2010-2012 landings, although this may change because as mentioned above, Puerto Rico commercial landings are still pending and not included and thus these results are preliminary.

Preferred Alternative 3

The results of the analysis conducted for **Preferred Alternative 3** are similar to the results obtained for **Alternative 2** under both ‘subject to overfishing’ and ‘not subject to overfishing’ or ‘unknown’ scenarios as shown in Tables 2.2.1.1.13 - 2.2.1.1.16, and discussed above, except for parrotfish (**Preferred Sub-alternative 3a**), surgeonfish (**Preferred Sub-alternative 3b**), angelfish (**Preferred Sub-alternative 3c**), queen conch (**Preferred Sub-alternative 3d**), and aquarium trade species (**Preferred Sub-alternative 3e**) FMUs. For these units per island/island region and sector, the results of the analysis would be similar to the results obtained for these units in the analysis of **Alternative 1** (Tables 2.2.1.1.11 and 2.2.1.1.12), as these sub-alternatives provide for these units to be exempted from the application of the control rule.

Under **Preferred Alternative 3** and considering only the changed ACLs for parrotfish, surgeonfish, angelfish, queen conch, and aquarium trade FMUs results in three (21%) out of the 14 FMUs had the landings exceed an ACL. A total of six (24%) ACLs were exceeded of the potential 25 ACLs.

2.2.2 Current Status of Stocks and Changes to Current Annual Catch Limits Proposed by the Annual Catch Limit Control Rule

Changes in overfishing status have been identified for all 2010 stocks since the preparation of the 2010 Caribbean ACL Amendment. The overfishing status of Grouper Unit (GU) 1, GU2, GU4, SU1, parrotfish, and queen conch went from ‘subject to overfishing’ to ‘not subject to overfishing’ in the 2012 4th Quarter Update on the Status of the U.S. Fisheries (http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/archive/2012/fourth/q4_2012_fssi_summarychanges.pdf), and continues to be classified as such in the most recent update ([NMFS Status of U.S. Fisheries 2014 1st Quarter](#)). Grouper Unit 3, GU5, SU2, SU3, and SU4 were reclassified from ‘unknown’ status to ‘not subject to overfishing’, and continue to have this classification. In the 2010 Caribbean ACL Amendment these units had their ACL set at 85% of the OFL (or ABC).

If the Council selects **Alternative 2**, and the control rule is implemented, then based on the information contained in the most recent update on the status of the stocks (NMFS Status of the Stocks, 2014 1st Quarter), the ACLs for all of the 2010 stocks would be set to a new value that would take effect starting with the calendar year following implementation of the control rule. This new value will respond to the change from ‘subject to overfishing’ (15% reduction or no reduction (i.e., queen conch) to ‘not subject to overfishing’ (10% reduction).

Changes in status have also been identified for all 2011 stocks since the preparation of the 2011 Caribbean ACL Amendment, as reported in the 2012 4th Quarter Update on the Status of the U.S. Fisheries. These statuses have not changed since then (2014 1st Quarter Update). However, most of these changes were from an ‘unknown’ status to a ‘not subject to overfishing’ status. In the 2011 Caribbean ACL Amendment, units classified as ‘unknown’ had their ACL set at 90% of the ABC similar to the units that were determined to not be subject to overfishing. The change from ‘unknown’ status to ‘not subject to overfishing’ status resulted from a comparison of each FMUs average landings to their established OFL and the resulting determination that for none of the FMUs did the average landings exceed the OFL except in the case where increased landings were attributed to enhanced reporting rather than to an actual increase in harvest. The squirrelfish, angelfish, and wrasses FMUs were found to have exceeded their corresponding OFLs in St. Croix and in St. Thomas/St John. It was determined by the SEFSC, in consultation with the Council, that the high landings reported for these units reflected enhanced reporting from modifications to the reporting forms that were introduced in July 2011. Therefore the overfishing status for these three units would remain as ‘unknown’.

Under **Alternative 2**, the currently established buffer reduction for the wrasses, squirrelfish, grunts, goatfish, jacks, scups and porgies, triggerfish and filefish, and boxfish FMUs for each of the islands and sectors would continue for the year following implementation of the control rule because those FMUs would still be classified as ‘not subject to overfishing’. As a result, the

ACL for each unit also would remain the same. In contrast, the currently established buffer reductions for the angelfish and surgeonfish FMUs, and for the Caribbean-wide aquarium trade species FMU would change to a new and lower value with a concomitant increase in the ACL for each unit. As discussed in Section 2.2.1, although the overfishing status for these units would remain the same, the buffer that was applied in the 2011 Caribbean ACL Amendment to determine the ACL for these units (i.e., 25% buffer) is more conservative than the 10% buffer reduction applied if **Alternative 2** is chosen. That change in the buffer reduction, from 25% to 10%, would result in a higher ACL.

If **Preferred Alternative 3** and all sub-alternatives are chosen by the Council and implemented, then based on the most recent status of stocks report, the buffer reduction for all grouper and snapper units on all islands and sectors would decrease from 15% to 10% for the year following implementation of the control rule because those units are now classified as ‘not subject to overfishing’. The ACL would then increase. The queen conch and the parrotfish ACLs would remain the same as established in the 2010 Caribbean ACL Amendment, as they would be exempted from the control rule. In a similar way, surgeonfish, angelfish, and the Caribbean-wide aquarium trade species FMUs would also retain their present buffer reductions and ACLs. Lastly, under **Preferred Alternative 3**, based on the most recent status of stocks report, there would be no change in the buffer reduction for the remainder of 2011 stocks on each island including the Caribbean-wide tilefish FMUs. Those units would retain their current ACLs for the year following implementation of the control rule because they continue to be classified as ‘not subject to overfishing’.

Please refer to Tables 2.2.1.1.7 - 2.2.1.1.10 to obtain the corresponding ACL value for the units discussed above. The information presented in this section could change if the overfishing status of any unit changes before this control rule is implemented, if implemented.

The control rule proposed in this amendment would not take into account the overfished status of a stock because overfished stocks are managed through rebuilding plans designed to achieve a stock abundance consistent with supporting the maximum sustainable yield on a continuing basis. The control rule proposed will continue to ensure that overfishing does not occur in the short-term, thereby maintaining steady progress toward the long-term goal of rebuilding overfished stocks while preventing other stocks from becoming overfished. In the near future, the Council may revisit the definition of management reference points and ACLs based on new available scientific information through the development of Island-Specific Fishery Management Plans. For more information about the recent status of the stocks as well as NMFS process for status determination, please see Section 3.2.2.1 of this comprehensive amendment.

2.2.3 Annual Process that Would be Used to Apply the Annual Catch Limit Control Rule under Alternative 2 or Preferred Alternative 3

If the Council chooses either **Alternative 2** or **Alternative 3 (Preferred)**, the regulations implementing the action in this amendment may include text briefly describing the control rule and would contain the ACL values for each FMU and sector within the unit that would apply 1) if the unit is determined to be subject to overfishing in a particular year, and 2) if the unit is determined not to be subject to overfishing in a particular year.

The overfishing status of a stock/stock complex would continue to be evaluated annually by NMFS (See Section 3.2.2 for a detailed discussion of the process for determining overfishing status). Recent annual landings available for each unit and sector within the unit, for all islands/island groups would be evaluated against the corresponding OFL. For all Council managed species, overfishing is determined to be occurring if annual landings exceed the assigned OFL, unless NMFS' SEFSC, in consultation with the Council and its SSC, determines that the overage occurred because data collection/monitoring improved rather than because landings actually increased.

If, in any particular year, the status of a unit changes, NMFS will officially notify the Council by letter regarding the status change and the corresponding change to a new buffer reduction value. NMFS would apply the buffer reduction defined by the control rule as specified in the corresponding FMP, and the ACL for the next year for that particular FMU would be adjusted.

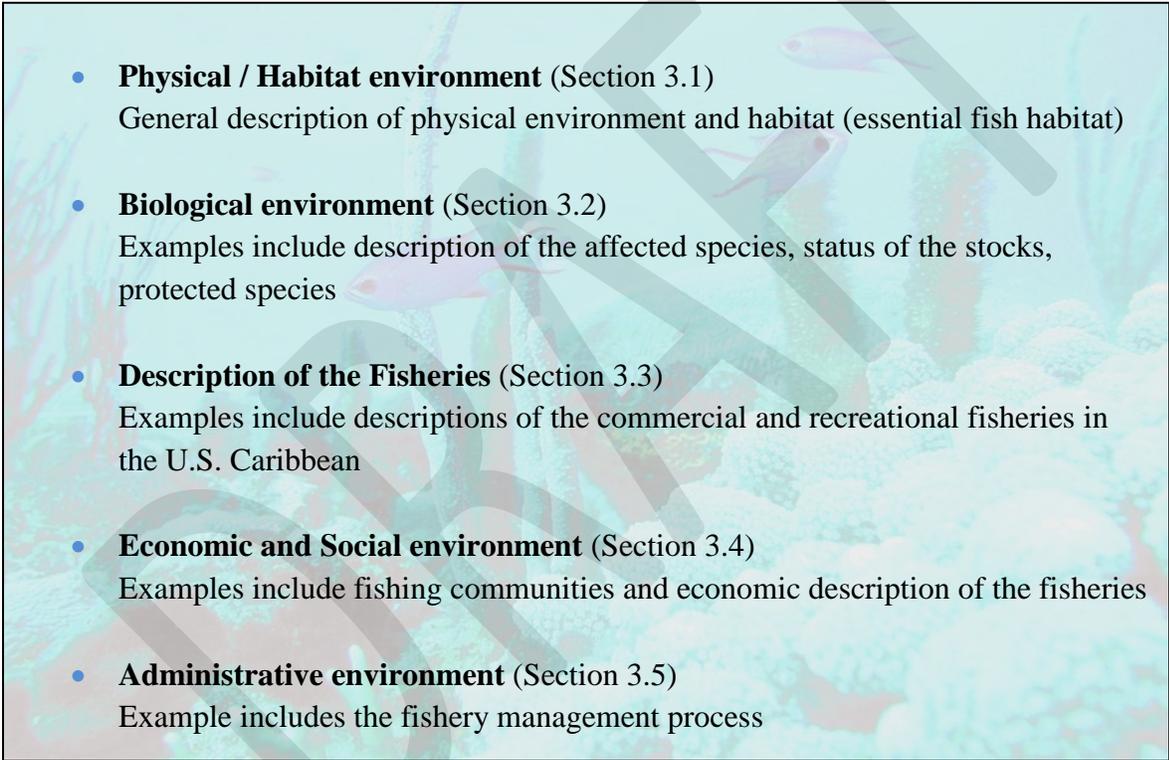
The public will be notified of the applicable ACL for a particular year by the following methods:

- The NMFS Southeast Regional Office (SERO) website will be annually updated to reflect the overfishing status and corresponding ACL for each unit per island and sector. *NMFS letter determination of a status change may also be included on the website.
- A Fishery Bulletin will be published annually that would list each unit, the overfishing status, and the corresponding ACL for that year based on that overfishing status. Fishery Bulletins will be distributed as usual through Constant Contact and through publication in English and Spanish on the NMFS SERO website and on the Council's website.

Chapter 3. Affected Environment

The action considered in this comprehensive amendment and associated environmental assessment (EA) would affect the U.S. Caribbean exclusive economic zone (EEZ) of Puerto Rico and the U.S. Virgin Islands (USVI) (Figure 3.1). Species affected by the action in this comprehensive amendment include all species included in the Fishery Management Plan (FMP) for the Reef Fish Fishery of Puerto Rico and the USVI (Reef Fish FMP), the FMP for the Queen Conch Resources of Puerto Rico and the USVI (Queen Conch FMP), the Corals and Associated Plants and Invertebrates FMP of Puerto Rico and the USVI (Coral FMP), and the Spiny Lobster FMP of Puerto Rico and the USVI (Spiny Lobster FMP).

The affected environment is divided into five major components:

- 
- **Physical / Habitat environment** (Section 3.1)
General description of physical environment and habitat (essential fish habitat)
 - **Biological environment** (Section 3.2)
Examples include description of the affected species, status of the stocks, protected species
 - **Description of the Fisheries** (Section 3.3)
Examples include descriptions of the commercial and recreational fisheries in the U.S. Caribbean
 - **Economic and Social environment** (Section 3.4)
Examples include fishing communities and economic description of the fisheries
 - **Administrative environment** (Section 3.5)
Example includes the fishery management process

The physical, biological, economic, social, and administrative environments have been described in detail in the 2010 and 2011 Caribbean Annual Catch Limit (ACL) Amendments (CFMC 2011a, b) and associated environmental impact statements (EIS), and in the most recent Caribbean actions affecting reef fish and queen conch, including Regulatory Amendment 4 to the Reef Fish FMP (CFMC 2013c) and Regulatory Amendment 2 to the Queen Conch FMP (CFMC 2013a). Information from these documents is incorporated by reference. These documents can be found on the National Marine Fisheries Service (NMFS) Sustainable Fisheries, Caribbean Branch website, http://sero.nmfs.noaa.gov/sustainable_fisheries/caribbean/index.html. Summaries of the affected environment can be found in Sections 3.1 - 3.5.2.

3.1 Physical/ Habitat Environment

The physical (including geology and climate) and habitat environments of the U.S. Caribbean were described in detail in the Generic Essential Fish Habitat (EFH) Amendment to FMPs of the U.S. Caribbean, the EFH Final Environmental Impact Statement (EFH-FEIS) (CFMC 1998, 2004), the Five -Year review of EFH in the U.S. Caribbean, Vols.1 and 2 (CFMC 2011c), and Regulatory Amendment 2 to the Queen Conch FMP (CFMC 2013a). These documents are incorporated herein by reference and are summarized below.

The U.S. Caribbean is located in the eastern portion of the Caribbean archipelago, about 1,100 miles (mi) (1,770 km) east-southeast of Miami, Florida (Olcott 1999). It comprises the Commonwealth of Puerto Rico in the Greater Antilles and the Territory of the USVI in the Lesser Antilles island chain (Figure 3.1.1), both of which separate the Caribbean Sea from the western central Atlantic Ocean. The U.S. Caribbean EEZ covers an area of approximately 196,029 square kilometers (km²) (75,687 square miles (m²)).

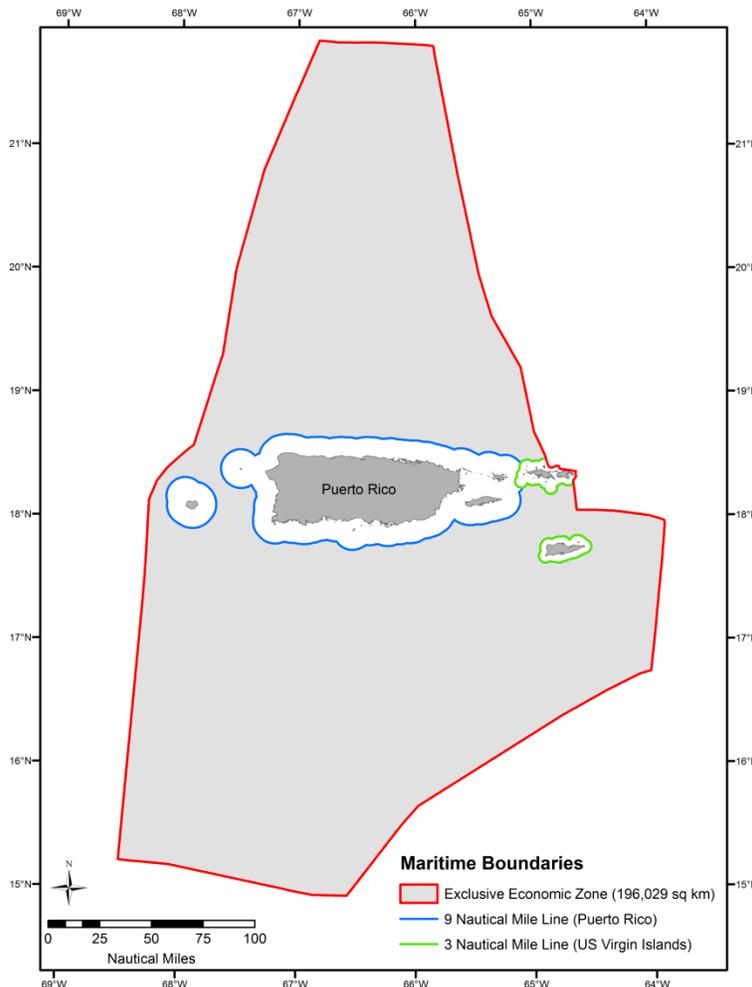


Figure 3.1.1. Boundaries of the U.S. Caribbean EEZ, Puerto Rico waters, and USVI waters. Source: NMFS 2014.

The USVI are part of the Virgin Islands chain, which lies in the northeastern Caribbean about 50 mi (80 km) east of Puerto Rico. The USVI consist of four major islands, St. Thomas, St. John, St. Croix, and Water Island, and about 50 cays (DPNR 2005). Together, the USVI total approximately 134 mi² (347 km²) of land area (Catanzaro et al. 2002).

The island of St. Croix is located about 46 mi (74 km) south of St. Thomas and St. John (CFMC 2004). Covering about 80 mi² (207 km²), St. Croix is entirely surrounded by the Caribbean Sea. The islands of St. Thomas and St. John are bordered by the Atlantic Ocean to the north and the Caribbean Sea to the south. Their respective areas are approximately 32 mi² (83 km²) and 20 mi² (52 km²) (Catanzaro et al. 2002).

The island of Puerto Rico is almost rectangular in shape, about 177 by 56 km (110 by 35 mi), and is the smallest and the most eastern island of the Greater Antilles (CFMC 1998, Morelock et al. 2001). Its coast measures approximately 1,227 km (700 mi) and includes the adjacent inhabited islands of Vieques and Culebra. In addition, the Commonwealth of Puerto Rico includes the islands of Mona, Monito, and various other isolated islands without permanent populations. Deep ocean waters fringe Puerto Rico. The Mona Passage, which separates the island from Hispaniola to the west, is about 120 km (75 mi) wide and more than 1,000 m (3,300 ft) deep. Off the northern coast is the 8,500 m (28,000 ft) deep Puerto Rico Trench, and to the south the sea bottom descends to the 5,000 m (16,400 ft) deep Venezuelan Basin of the Caribbean Sea.

The island of St. Croix lies on a different geological platform than the islands of St. Thomas and St. John, and is separated from those islands by a 2.5 mi (4 km) deep trench (CFMC 2004) (Figure 3.1.1.2). The shelf shared by the islands of St. Thomas and St. John has an area of approximately 510 nm² (1751 km²) with most of the shelf more than 80 feet (ft) (24.4 m) deep (Kojis and Quinn 2012). The St. Croix shelf is much narrower and shallower than that of the northern islands (Goenaga and Boulon 1991), extending only 2.2 nm (4 km) wide in the south, less than 0.1 nm (0.2 km) wide on the northwest, and up to several nautical miles wide in the northeast and on Lang Bank (CFMC 2004; CFMC 2011a). In total, the St. Croix shelf has an area of approximately 99 nm² (343 km²) (references in Gordon 2010) with most of the shelf less than 80 ft (24.4 m) deep (Kojis and Quinn 2012).

Puerto Rico shares the same shelf platform as St. Thomas and St. John, and that shelf also extends east to include the British Virgin Islands. The St. Croix platform connects through a deep submerged mountain range (including Grappler Bank and Investigador, among other banks in the EEZ) to the southeast platform of Puerto Rico (Figure 3.1.2).

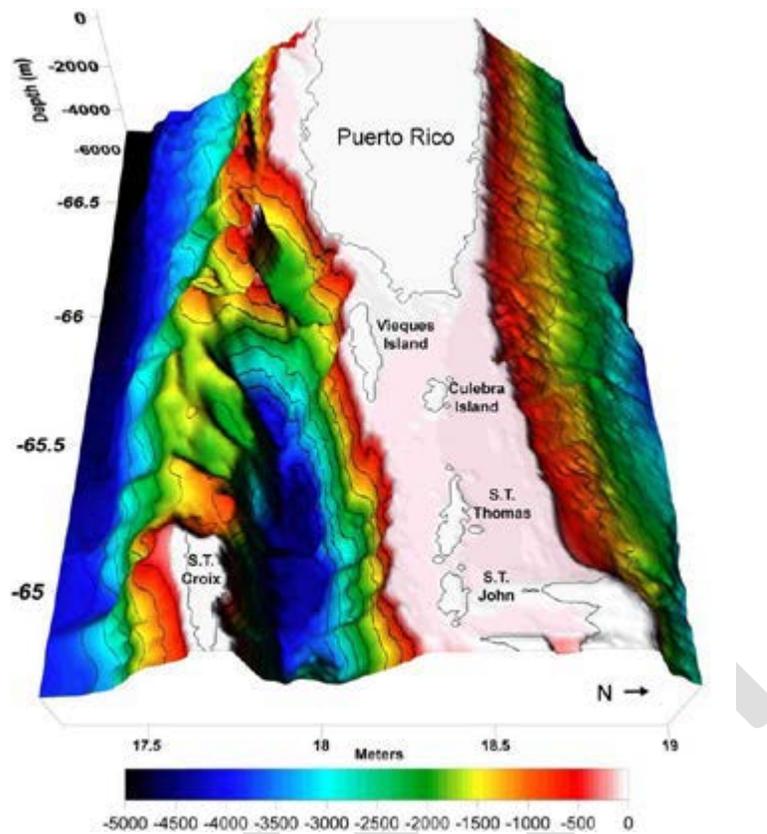


Figure 3.1.2. Shared platform between the east coast of Puerto Rico and St. Thomas/St. John. The deep trough between the Puerto Rico/St. Thomas/St. John platform and St. Croix is clearly seen in this graphic representation of depth (Source: García-Sais et al. 2005).

Habitat

A description of the major habitat types in the U.S. Caribbean EEZ, along with information on their ecological functions and condition, can be obtained in Section 3.2 of the EFH-FEIS (CFMC 2004) and in Section 5.1.3 of the Caribbean SFA Amendment (CFMC 2005), are incorporated herein by reference, and are summarized below. A description of the major habitat types of the USVI can be found in the USVI Marine Resources and Fisheries Strategic and Comprehensive Conservation Plan, prepared by the Department of Planning and Natural Resources of the USVI (DPNR 2005) and are incorporated herein by reference. For a description of the major habitat types of Puerto Rico, please see García-Sais et al. (2008).

The coastal marine environment of the USVI and Puerto Rico is characterized by a wide variety of habitat types. Kendall et al. (2001) delineated 21 distinct benthic habitats types. The EFH-FEIS (CFMC 2004) summarized the percent distribution for all habitats in the U.S. Caribbean from the 2,121 mi² (5,494 km²) of total bottom area mapped from aerial photographs. This total

included both Puerto Rico (1,934 mi² (5,009 km²)) and the USVI (187 mi² (485 km²)), and covered from the shore line to about 66 ft (20 m) depth.

In the USVI, 9 mi² (24 km²) of unconsolidated sediment, 62 mi² (161 km²) of SAV, 0.8 mi² (2 km²) of mangroves, and 116 mi² (300 km²) of coral reef and hard bottom were mapped over an area of 187 mi² (485 km²). In Puerto Rico, 19 mi² (49 km²) of unconsolidated sediment, 278 mi² (721 km²) of SAV, 28 mi² (73 km²) of mangroves, and 292 mi² (756 km²) of coral reef and colonized hard bottom were mapped (CFMC 2013).

Essential Fish Habitat

Essential fish habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as “those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 U.S. C. 1802(10)). Specific categories of EFH identified in Puerto Rico and the USVI, which are utilized by federally managed fish and invertebrate species, include both estuarine/inshore and marine/offshore areas. Specifically, estuarine/inshore EFH includes estuarine emergent and mangrove wetlands, submerged aquatic vegetation, intertidal flats, palustrine emergent and forested systems, and the estuarine water column. Additionally, marine/offshore EFH includes live/hard bottom habitats, coral and coral reefs, seagrass and algal plains, sand and shell substrate, and the marine water column. Essential fish habitat includes the spawning area in the water column above the adult habitat. EFH utilized by fish and invertebrate species in this region includes coral reefs, live/hard bottom, and submerged aquatic vegetation.

Habitat Areas of Particular Concern

In addition to protecting habitat from fishing related degradation through FMP regulations, the Caribbean Fishery Management Council, with guidance from its Advisory Panel and Scientific and Statistical Committee (SSC), consults on any relevant habitat issues.

3.2 Biological and Ecological Environment

3.2.1 Description of the Species: Biology/Ecology

The biological environment of the U.S. Caribbean, including the species addressed in this comprehensive amendment, is described in detail in the 2010 and 2011 Caribbean ACL Amendments (CFMC 2011a, b). Species affected by the action in this amendment include species in the Reef Fish, Coral, Queen Conch, and Spiny Lobster FMPs. Species in these FMPs are managed as stocks or stock complexes in fishery management units (FMUs).

Table 3.2.1.1. Species included in the Reef Fish, Coral, Spiny Lobster, and Queen Conch FMPs.

Fishery Management Unit	
REEF FISH FMP	
<u>Grouper Unit 1</u> Nassau grouper , <i>Epinephelus striatus</i>	<u>Goatfish FMU</u> Spotted goatfish, <i>Pseudupeneus maculatus</i> ; Yellow goatfish, <i>Mulloidichthys martinicus</i>
<u>Grouper Unit 2</u> Goliath grouper , <i>Epinephelus itajara</i>	<u>Tilefishes FMU</u> Blackline tilefish, <i>Caulolatilus cyanops</i> Sand tilefish, <i>Malacanthus plumieri</i>
<u>Grouper Unit 3</u> Red hind , <i>Epinephelus guttatus</i> , coney <i>Cephalopholis fulvus</i> , rock hind, <i>Epinephelus adscensionis</i> , Graysby, <i>Cephalopolis cruentata</i>	<u>Scups and Porgies FMU</u> Jolthead porgy, <i>Calamus bajonado</i> , Sea bream, <i>Archosargus rhomboidalis</i> , Sheepshead porgy, <i>Calamus penna</i> ; Pluma, <i>Calamus pennatula</i>
<u>Grouper Unit 4</u> Black grouper <i>Mycteroperca bonaci</i> ; Red grouper, <i>Epinephelus morio</i> , Tiger grouper, <i>Mycteroperca tigris</i> , Yellowfin grouper, <i>Mycteroperca venenosa</i>	<u>Squirrelfish FMU</u> Blackbar soldierfish, <i>Myripristis jacobus</i> , Bigeye, <i>Priacanthus arenatus</i> , Longspine squirrelfish, <i>Holocentrus rufus</i> ; Squirrelfish, <i>Holocentrus adscensionis</i>
<u>Grouper Unit 5</u> Misty grouper , <i>Epinephelus mystacinus</i> , Yellowedge grouper , <i>Epinephelus flavolimbatus</i>	<u>Surgeonfish FMU</u> Blue tang, <i>Acanthurus coeruleus</i> , Ocean surgeonfish, <i>Acanthurus bahianus</i> ; Doctorfish, <i>Acanthurus chirurgus</i>
<u>Snapper Unit 1</u> Black snapper, <i>Apsilus dentatus</i> ; blackfin snapper, <i>Lutjanus buccanella</i> ; Silk snapper , <i>Lutjanus vivanus</i> , Vermilion snapper <i>Rhomboplites aurorubens</i> , Wenchman, <i>Pristipomoides aquilonaris</i>	<u>Grunts FMU</u> White grunt, <i>Haemulon plumierii</i> ; Margate, <i>Haemulon albu</i> ; Tomtate, <i>Haemulon aurolineatum</i> ; Bluestriped grunt, <i>Haemulon sciurus</i> ; French grunt, <i>Haemulon flavolineatum</i> ; Porkfish, <i>Anisotremus virginicus</i>
<u>Snapper Unit 2</u> Cardinal snapper, <i>Pristipomoides macrophthalmus</i> , Queen snapper , <i>Etelis oculatus</i>	<u>Wrasses FMU</u> Hogfish, <i>Lachnolaimus maximus</i> ; Puddingwife, <i>Halichoeres radiates</i> ; Spanish hogfish, <i>Bodianus rufus</i>
<u>Snapper Unit 3</u> Gray snapper, <i>Lutjanus griseus</i> , Lane snapper, <i>Lutjanus synagris</i> , Mutton snapper, <i>Lutjanus analis</i> , Dog snapper <i>Lutjanus jocu</i> , Schoolmaster , <i>Lutjanus apodus</i> , Mahogany snapper, <i>Lutjanus mahogoni</i>	<u>Jacks FMU</u> Blue runner, <i>Caranx crysos</i> ; Horse-eye jack, <i>Caranx latus</i> ; Black jack, <i>Caranx lugubris</i> ; Almaco jack, <i>Seriola rivoliana</i> ; Bar jack, <i>Caranx ruber</i> ; Greater amberjack, <i>Seriola dumerili</i> ; Yellow jack, <i>Caranx bartholomaei</i>
<u>Snapper Unit 4</u> Yellowtail snapper, <i>Ocyurus chrysurus</i>	<u>Angelfish FMU</u> Queen angelfish, <i>Holocanthus ciliaris</i> ; Gray angelfish, <i>Pomacanthus arcuatus</i> ; French angelfish, <i>Pomacanthus paru</i>

Fishery Management Unit

Parrotfish Unit

Blue parrotfish, *Scarus coeruleus*, Midnight parrotfish, *Scarus coelestinus*, Princess parrotfish, *Scarus taeniopterus*, Queen parrotfish, *Scarus vetula*, Rainbow parrotfish, *Scarus guacamaia*, Redfin parrotfish, *Sparisoma rubripinne*, Redtail parrotfish, *Sparisoma chrysopterum*, Stoplight parrotfish, *Sparisoma viride*, Redband parrotfish, *Sparisoma aurofrenatum*, Striped parrotfish, *Scarus iseri* (formerly *Scarus croicensis*)

Aquarium Trade Species¹

Boxfish FMU

Honeycomb cowfish, *Acanthostracion polygonus* (formerly *Lactophrys polygona*); Scrawled cowfish, *Acanthostracion quadricornis* (formerly *Lactophrys quadricornis*); Trunkfish, *Lactophrys trigonus*; Spotted trunkfish, *Lactophrys bicaudalis*; Smooth trunkfish, *Lactophrys triqueter*

Triggerfish and Filefish FMU

Ocean triggerfish, *Canthidermis sufflamen*; Queen triggerfish, *Balistes vetula*; Sargassum triggerfish, *Xanthichthys ringens*; Black durgon, *Melichthys niger*; Scrawled filefish, *Aluterus scriptus*; Whitespotted filefish, *Cantherhines macrocerus*

QUEEN CONCH FMP

Queen conch, *Strombus gigas*

SPINY LOBSTER FMP

Spiny lobster, *Panulirus argus*

CORALS AND ASSOCIATED PLANTS AND INVERTEBRATES

Prohibited corals and invertebrates¹

Aquarium Trade Species¹

¹A comprehensive list of the species included in these FMUs can be found in 50 CFR Part 622, Appendix A to Part 622—Species Tables, http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

A complete description of the life history characteristics and ecology of all Caribbean Fishery Management Council managed species can be found in the 2005 Caribbean Sustainable Fisheries Act (SFA) Amendment (CFMC 2005), the 2010 Caribbean ACL Amendment (CFMC 2011a), and the 2011 Caribbean ACL Amendment (CFMC 2011 b), and is incorporated in here by reference. The most recent description of the biology and ecology of the parrotfish FMU can be found in Regulatory Amendment 4 to the Reef Fish FMP (CFMC 2013c). Regulatory Amendment 2 to the Queen Conch FMP has the most updated information for the queen conch in federal waters (CFMC 2013b). The biology and ecology of managed corals and reef associated plants and invertebrates were updated through Amendment 4 to the Coral FMP (CFMC 2013a).

3.2.2 Overview of Status Determinations for Stocks (Overfished, Overfishing, and Unknown Status)

The Magnuson-Stevens Act requires that an FMP specify objective and measurable criteria, or reference points, for determining when a stock is subject to overfishing or is overfished⁴ (NMFS 2012). By incorporating the best scientific information available (which may include landings, scientific surveys, and biological and ecological studies), stock assessments (if available) and reference points are used to make overfishing or overfished determinations for a stock. This information is also used by the Fishery Management Councils to recommend the ACL for the stock (NMFS 2013a).

Overfishing Status Determination

Overfishing occurs whenever a stock or stock complex is subjected to a rate or level of fishing mortality that jeopardizes the capacity of a stock or stock complex to produce maximum sustainable yield (MSY) on a continuing basis (CFMC 2011a). A determination of overfishing does not necessarily mean that the fishery is not sustainable or that the stock or its ecosystem is being impaired. These negative outcomes are associated with high levels of overfishing over a period of many years. Management approaches, such as ACLs and AMs (AMs), serve to prevent overfishing, thus reducing the likelihood that damaging levels of overfishing will occur (NMFS 2013a).

For Caribbean Council managed species, overfishing is occurring when a) the fishing mortality rate exceeds the maximum fishing mortality rate only in the year the stock is assessed; and b) catch exceeds the OFL in all other years when the stock is not assessed (NMFS 2013c). As discussed in Section 1.6 (“Current Management Reference Points or Proxies”), annual landings for all Council managed species would be evaluated relative to the OFL to determine whether overfishing is or is not occurring. This approach is consistent with National Standard (NS) 1

Overfishing—A stock with a fishing mortality (harvest) rate too high to produce its maximum sustainable yield (MSY), which is the largest long-term average catch that can be taken from a stock under prevailing environmental and fishery conditions. The target level of stock abundance is the population that can produce MSY.

Overfished—A stock with a biomass level depleted to a degree that the stock’s capacity to produce MSY is jeopardized.

⁴ “Section 303(a)(10) requires that FMPs specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery. Further, under Section Sec. 304(e)(1) of the Act, the overfishing criteria specified in the FMP is used to determine the stock status.(NMFS 2013b). Status Determination Criteria (SDC): Objective and measurable criteria used to determine if a stock is being overfished or is in an overfished state according to National Standard Guidelines.

guidelines, which provide fishery managers the flexibility to determine if overfishing occurs based on either fishing mortality rates or actual annual catch (CFMC 2011a).

Specifically, for all units addressed in the 2010 and 2011 Caribbean ACL Amendments (from here on referred to as 2010 and 2011 stocks, respectively), for an FMU to be determined to be 'subject to overfishing', reported landings must have exceeded the OFL, unless NMFS' Southeast Fisheries Science Center (SEFSC), in consultation with the Council and its SSC, determines that the overage occurred because data collection/monitoring improved, rather than because landings actually increased.

If the Secretary of Commerce (Secretary) determines at any time that a fishery is subject to overfishing, the Secretary shall immediately notify the appropriate Council and request that action be taken to end overfishing in the fishery and to implement conservation and management measures to rebuild affected stocks of fish.

Overfished Status Determination

A stock that is overfished has a biomass level depleted to a degree that the stock's capacity to produce the MSY is jeopardized. While overfishing may be the main cause for depletion of a stock, there are also other factors that can affect the abundance of a fish stock and lead to an overfished listing, such as abnormal levels of disease, extreme population cycles, habitat degradation, and environmental changes such as climate, ocean acidification, and land based pollution (NMFS 2013a).

For Caribbean Council managed species, a stock is determined to be overfished when its stock size is less than the minimum stock size threshold (MSST) set = biomass at MSY (B_{MSY}) $(1-c)$; where c = the natural mortality rate (M) or 0.50, whichever is smaller. These values were estimated for 2010 stocks, however, for 2011 stocks, an estimate of B_{MSY} or proxy is not available, and thus the overfished status is 'unknown'

(http://www.nmfs.noaa.gov/sfa/statusoffisheries/2012/RTC/2012_Appendix3.pdf)

When the Secretary determines that a stock is overfished, the Council must implement a plan to rebuild it to the level that can support the MSY (NMFS 2013a).

'Unknown' Status Determination

A stock is classified as 'unknown' when the data in a stock assessment were insufficient and it fails to provide a known conclusion about the overfishing and/or overfished status. Section 304 (e)(1) of the Magnuson-Stevens Act specifies that, for those stocks in a FMP or international agreement, the status shall be determined using the criteria specified in the FMP or agreement. Stocks are listed as 'unknown' when the stock does not have status determination criteria (SDC) that can be used to determine stock status. A stock can also be classified as 'unknown' when the

stock has defined SDC but have never been assessed relative to these SDC or the assessment failed to provide a conclusive determination about stock status (NMFS 2013b).

3.2.2.1 Status of the Stocks: Southeast Data Assessment and Review (SEDAR) and NMFS Status of U.S. Fisheries Annual Report to Congress

SEDAR

The Council-Federal cooperative SEDAR process provides stock assessments for fisheries resources of NMFS. Despite several attempts, no acceptable quantitative assessments have been developed for Caribbean stocks because data to support traditional stock assessment methods simply do not exist for the species considered so far (SEDAR Procedures Workshop 2009). Caribbean species that have been assessed through the SEDAR process are listed below. The SEDAR website provides complete reports for these species (<http://www.sefsc.noaa.gov/sedar/>). For most of these stocks, the data has been deemed insufficient to conduct proper assessments. Other methods to deal with Caribbean data have been suggested, for example in the Caribbean Data Evaluation Workshop held in 2009 (http://www.sefsc.noaa.gov/sedar/download/CaribData_Final.pdf?id=DOCUMENT).

- Caribbean-Atlantic Deepwater Snapper-Grouper (SEDAR 04, 2003-2004)
- Caribbean Spiny Lobster & Yellowtail Snapper (SEDAR 08 A, 2005)
- Caribbean Yellowfin Grouper, Mutton Snapper, Queen Conch (SEDAR 14, 2007)
- Caribbean Queen Snapper, Silk Snapper and Redtail Parrotfish (SEDAR 26, 2011⁵)
- Caribbean Blue Tang and Queen Triggerfish (SEDAR 30, 2012)
- Caribbean Red Hind (SEDAR 35, 2014-ongoing)

NMFS Status of U.S. Fisheries Annual Report to Congress

The status of all stocks managed under the Magnuson-Stevens Act is reported in the Annual Report to Congress on the Status of U.S. Fisheries (i.e., Status of Stocks) pursuant to the Magnuson-Stevens Act. The National Marine Fisheries Service Office of Sustainable Fisheries updates the Status of Stocks on a quarterly basis utilizing the most current stock assessment information (NMFS 2013b). For purposes of this report, the status of all managed species contained in an FMP is to be reported at the level for which the status determination criteria are specified in the FMP (NMFS 2013b). Results are presented as the Fish Stock Sustainability Index (FSSI) in the Annual Report to Congress of the Status of U.S. Fisheries. The report provides a ‘snapshot’ of the status of U.S. fisheries at the end of the specific year (NMFS 2013a).

⁵ SEDAR 26 (2011) outcomes indicated that the evaluated species were not undergoing overfishing. However, it was not possible to derive standard reference points from this assessment.

NMFS developed the FSSI to track the outcome of building and maintaining fish stocks and complexes at productive levels and to incorporate the critical components of managing fish harvest rates and increasing knowledge about the status of fish stocks and complexes. The FSSI is based on a set of fish stocks and complexes selected for their importance to commercial and recreational fisheries (NMFS 2013b). The FSSI stocks are queen conch, GU1, GU2, GU4, SU1, SU3, SU4, and spiny lobster, all reported at the Caribbean level. Non-FSSI stocks are parrotfish, SU2, GU3, GU5, aquarium trade species, and tilefish, all at the Caribbean level, and angelfish, boxfish, goatfish, grunts, jacks, porgies, squirrelfish, surgeonfish, triggerfish and filefish, wrasses, at the individual island/island region level (Puerto Rico, St. Croix, and St. Thomas/St. John).

If the Secretary determines that a stock or stock/complex is determined to be overfished or undergoing overfishing, the Secretary shall officially notify the appropriate Fishery Management Council and request that action be taken to end overfishing in the fishery and to implement conservation and management measures to rebuild affected stocks of fish. Within NMFS, the task of making the determinations of overfishing and overfished has been delegated to the Assistant Administrator (AA) for Fisheries. Once a stock assessment or other accepted basis is peer reviewed and accepted as Best Scientific Information Available, the Regional Administrator (RA) submits an Issues Advisory/Decision Memo (DM) requesting that the AA concur with the status indicated in the DM. Informing the Councils of stocks subject to overfishing or overfished stocks is the duty of the RA and will be communicated by a formal letter notifying them of such status (Magnuson-Stevens Act Section 304(e) (2) (NMFS 2013b)).

For most of the U.S. Caribbean managed species, multiple species are grouped into stock complexes, and the status of the stock complex is reported as a single unit (e.g., GU2, parrotfish complex) (NMFS 2013b). Others are reported as a single species, such as the case of queen conch and spiny lobster. For example, the 2010 Caribbean ACL Amendment defined the OFLs at the complex level for groupers and snappers Caribbean-wide (e.g., all groupers and all snappers) but the FSSI/Non-FSSI stocks are reported at the individual unit level (e.g., GU1, Snapper Unit (SU) 1). Until the FSSI is modified to reflect changes in the stock reporting units for snappers and groupers, stocks will continue to be listed at the individual snapper and grouper unit levels and if landings do not exceed the OFL for the complex, then the individual units will be reported as not subject to overfishing in the FSSI.

In addition, until recently, the status of stocks listed all the stocks at the U.S. Caribbean level, although the 2011 Caribbean ACL Amendment defined OFLs by island region. The 4th Quarter 2013 Report on the Status of the U.S. Fisheries (2013 4th Quarter Report) started reporting the status per island region for ten of the non-FSSI species complexes that had previously defined island-specific OFLs (CFMC 2011b): angelfishes, boxfishes, goatfishes, grunts, jacks, porgies, squirrelfishes, surgeonfishes, triggerfishes and filefishes, and wrasses. Fish Stock Sustainability

Index stocks with defined OFLs per island or island region, such as the spiny lobster, will be reported as such in fiscal year 2015.

Current Overfishing Status Determination for Caribbean Council Managed Stocks/Stock Complexes

Through the end of 2011, before the implementation of ACLs and AMs in 2012, U.S. Caribbean FSSI stocks including queen conch, GU1, GU2, GU4, SU1, and the non-FSSI parrotfish complex were classified as ‘subject to overfishing’. The overfishing status of the FSSI stocks SU3, SU4, and spiny lobster was determined to be ‘unknown’ (NMFS 2012). In late 2012, these stocks were reclassified from ‘subject to overfishing’ or status ‘unknown’ to ‘not subject to overfishing’ (NMFS 2013a). For these stocks/stocks complexes the ‘not subject to overfishing’ classification continues to this day as reported in the most recent quarterly update to the Status of the Stocks ([2014 1st Quarter Update](#)). The information used to make the most recent status determination in the FSSI (available at the time of preparation of this comprehensive amendment) was based on the most recent data available for Puerto Rico, St. Croix, and St. Thomas/St. John. This information corresponds to 2011 annual landings for the Puerto Rico commercial and recreational sectors and commercial landings for St. Croix and St. Thomas/St. John.

Seven non-FSSI stock complexes in each of Puerto Rico, St. Croix, and St. Thomas/St. John (i.e., grunts, goatfish, scups and porgies, jacks, triggerfish and filefish, boxfish, surgeonfish) as well as three non-FSSI stocks reported at the Caribbean level (i.e., GU3, GU5, and SU2) are currently classified in the 2014 1st Quarter Update on the Status of the Stocks as ‘not subject to overfishing’ as updated from the previous ‘unknown’ or ‘undefined⁶’ status in 2011 (Table 3.2.2.1). The aquarium trade species FMU as well as the tilefish FMU, both reported at the Caribbean level since neither of them have defined OFLs per island or island region, are also currently determined to be ‘not subject to overfishing’ from their previously ‘undefined’ and ‘unknown’ classifications, respectively.

During the most recent evaluations of stock status (2013 4th Quarter Update and 2014 1st Quarter Update), the St. Croix and St. Thomas/St. John angelfish, squirrelfish, and wrasses stock complexes (non-FSSI) were found to have exceeded their OFLs. However, the SEFSC, in consultation with the Council, determined that the high landings reported for these species were due to enhanced reporting reflecting modifications to the reporting forms introduced in 2011 in the USVI. For this reason, the status of these complexes continues to be defined as ‘unknown’, until more data becomes available.

Section 2.2.2 of this document discusses the current status of the stocks and how it relates to the action proposed by this amendment.

⁶ Stocks listed as ‘undefined’ are those for which there is no status criterion by which to make a determination (NMFS 2011c).

Table 3.2.2.1. Comparison of ‘subject to overfishing’ stock status classification for all U.S. Caribbean managed FMUs among the NMFS Status of U.S. Fisheries 2011 Report, the NMFS Status of U.S. Fisheries 2012 Report, and the 2014 1st Quarter Update report on the NMFS Status of U.S. Fisheries. (Sources: NMFS Status of U.S. Fisheries Reports http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/fssi.html).

FMU	OFL Definition	Annual Report 2011	Annual Report 2012	2014 1 st Quarter Update
Grouper Unit 1 ¹ (GU1)	Caribbean-Wide Level	Yes	No	No
GU2 ¹		Yes	No	No
GU3		Unknown	No	No
GU4		Yes	No	No
GU5		Unknown	No	No
SU1		Yes	No	No
SU2		Unknown	No	No
SU3		Unknown	No	No
SU4		Unknown	No	No
Parrotfish		Yes	No	No
Queen Conch		Yes	No	No
Aquarium Trade Species ²		Undefined	No	No
Tilefish		Unknown	No	No
Spiny Lobster ³		Puerto Rico (PR), St. Croix (STX), St. Thomas/St. John (STT/ STJ) but reported at the Caribbean Wide level	Unknown	No
				OFL Definition
Angelfishes	Unknown	Unknown	Unknown	PR
				STX
				STT/STJ
Wrasses	Unknown	Unknown	Unknown	PR
				STX
				STT/STJ
Squirrelfish	Unknown	Unknown	Unknown	PR
				STX
				STT/STJ
Grunts	Unknown	No	No	PR
				STX
				STT/STJ
Goatfish	Unknown	No	No	PR
				STX
				STT/STJ
Jacks	Unknown	No	No	PR
				STX
				STT/STJ
Scups & Porgies	Unknown	No	No	PR
				STX
				STT/STJ

Triggerfish and Filefish	Unknown	No	PR	No
			STX	
			STT/STJ	
Boxfish	Unknown	No	PR	No
			STX	
			STT/STJ	
Surgeonfish	Unknown	No	PR	No
			STX	
			STT/STJ	

¹Harvest prohibited in the EEZ.

² Aquarium Trade Species include species in the Reef Fish FMP and in the Corals and Reef Associated Plants and Invertebrates FMP.

* Grouper Unit (GU) 1: Nassau grouper; GU2: goliath grouper; GU3: red hind, coney, graysby, and rock hind; GU4: yellowfin, red, tiger, and black groupers; Snapper Unit (SU) 1: silk, blackfin, black, vermillion, and wenchman snappers; SU2: cardinal and queen snappers; SU3: gray, lane, mutton, dog, schoolmaster, and mahogany snappers; SU4: yellowtail snapper.

³ The OFL for the spiny lobster is defined at the individual island/island region level (Puerto Rico, STX, and STT/STJ) however, in the FSSI it is reported at the Caribbean level.

Current Overfished Stocks

Stocks currently classified as overfished, including GU1 (i.e., Nassau grouper), GU2 (i.e., goliath grouper), GU4 (i.e., yellowfin, red, black, and tiger groupers), and queen conch, continue to be managed through rebuilding plans implemented through the Sustainable Fisheries Act Amendment in 2005 (CFMC 2005) (Table 3.2.2.2). For overfished stocks, rebuilding plans are special forms of target control rules to be implemented when stocks have fallen below limit biomass levels (Restrepo et al. 1998). Rebuilding plans are required until the stock has been rebuilt to a level consistent with supporting MSY on a sustainable basis (NMFS 2013b). A typical rebuilding plan allows fishing to continue, but at a reduced level so that the stock will increase to its target level and can produce the MSY (NMFS 2013a). Current management of U.S. Caribbean overfished stocks allows for the harvest of GU4 and queen conch; harvest prohibitions continue to be in place for GU1 and GU2.

The SU1 and parrotfish complex, both reported at the Caribbean level, continue to be classified as not overfished. The remainder of the Caribbean stocks (per island/island region or at Caribbean-wide level) continues to be classified as ‘unknown’ (Table 3.2.2.2). A stock is classified as unknown when the data in a stock assessment were insufficient and it fails to provide a known conclusion about the overfishing and/or overfished status.

Table 3.2.2.2. Comparison of ‘overfished’ stock status classification for Council managed stocks/stocks complexes among the NMFS Status of U.S. Fisheries 2011 Report, NMFS Status of U.S. Fisheries 2012 Annual Report, and the 2014 1st Quarter Update on the NMFS Status of U.S. Fisheries. (Sources: NMFS Status of U.S. Fisheries Reports http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/fssi.html).

FMU	OFL Definition	Annual Report 2011	Annual Report 2012	2014 1 st Quarter Update	Rebuilding Plan / Date Completion
GU1 ¹	Caribbean Wide Level	Yes	Yes	Yes	Yes/2030
GU2 ¹		Yes	Yes	Yes	Yes /2035
GU3		Unknown	Unknown	Unknown	
GU4		Yes	Yes	Yes	Yes/2015
GU5		Unknown	Unknown	Unknown	
SU1		No	No	No	
SU2		Unknown	Unknown	Unknown	
SU3		Unknown	Unknown	Unknown	
SU4		Unknown	Unknown	Unknown	
Parrotfish		No	No	No	
Queen Conch		Yes	Yes	Yes	Yes/2020
Aquarium Trade Species ²		Undefined	Unknown	Unknown	
Tilefish		Unknown	Unknown	Unknown	
Spiny Lobster ³	Defined at individual island level but reported at Caribbean Wide level	Unknown	Unknown	Unknown	
				OFL Definition	
Angelfish	Unknown	Unknown	Unknown	PR	Unknown
				STX	
				STT/STJ	
Wrasses	Unknown	Unknown	Unknown	PR	Unknown
				STX	
				STT/STJ	
Squirrelfish	Unknown	Unknown	Unknown	PR	Unknown
				STX	
				STT/STJ	
Grunts	Unknown	Unknown	Unknown	PR	Unknown
				STX	
				STT/STJ	

FMU	Annual Report 2011	Annual Report 2012	2014 1 st Quarter Update Report	
			OFL Definition	
Goatfish	Unknown	Unknown	PR	Unknown
			STX	
			STT/STJ	
Jacks	Unknown	Unknown	PR	Unknown
			STX	
			STT/STJ	
Scups & Porgies	Unknown	Unknown	PR	Unknown
			STX	
			STT/STJ	
Triggerfish and Filefish	Unknown	Unknown	PR	Unknown
			STX	
			STT/STJ	
Boxfish	Unknown	Unknown	PR	Unknown
			STX	
			STT/STJ	
Surgeonfish	Unknown	Unknown	PR	Unknown
			STX	
			STT/STJ	

¹Harvest prohibited in the EEZ.

² Aquarium Trade Species include species in the Reef Fish FMP and in the Corals and Reef Associated Plants and Invertebrates FMP.

*Grouper Unit (GU)1: Nassau grouper; GU2: goliath grouper; GU3: red hind, coney, graysby, and rock hind; GU4: yellowfin, red, tiger, and black groupers; Snapper Unit (SU)1: silk, blackfin, black, vermillion, and wenchman snappers; SU2: cardinal and queen snappers; SU3: gray, lane, mutton, dog, schoolmaster, and mahogany snappers; SU4: yellowtail snapper.

³ The OFL for the spiny lobster is defined at the individual island/island region level (Puerto Rico, STX, and STT/STJ) however, in the FSSI it is reported at the Caribbean level.

3.2.3 Protected Species

At least seventeen species of whales and dolphins have been reported in or near U.S. waters in the northeastern Caribbean (Mignucci-Giannoni 1998). All seventeen are protected under the Marine Mammal Protection Act (MMPA). Four of these species are also listed as endangered under the Endangered Species Act (ESA) (i.e., sperm, sei, fin, and humpback whales). ESA-listed species known to occur in this area include the humpback, fin, sei, and sperm whale. In addition to those marine mammals, four species of sea turtles (green, hawksbill, leatherback, and loggerhead); and two *Acropora* coral species (elkhorn [*Acropora palmata*] and staghorn [*A. cervicornis*]) are also protected under the ESA. Portions of designated critical habitat for loggerhead, green, and leatherback sea turtles, as well as *Acropora* corals also occur within the U.S. Caribbean. The potential impacts from the continued authorization of the fishing under the FMPs for the Reef Fish Resources, Corals and Reef Associated Plants and Invertebrates, Spiny Lobster, and Queen Conch, of Puerto Rico and the USVI on all ESA-listed species have been

considered in previous ESA Section 7 consultations. Summaries of those consultations and their determination are in Appendix A (Other Applicable Law). Those consultations indicate that one or more of those fisheries are likely to interact with sea turtles and *Acropora* coral and *Acropora* critical habitat; these entities are described briefly below.

Green sea turtle hatchlings are thought to occupy pelagic areas of the open ocean and are often associated with *Sargassum* rafts (Carr 1987, Walker 1994). Pelagic stage green sea turtles are thought to be carnivorous. Stomach samples of these animals found ctenophores and pelagic snails (Frick 1976; Hughes 1974). At approximately 20 to 25 cm (7.9 – 9.9 inches) carapace length, juveniles migrate from pelagic habitats to benthic foraging areas (Bjorndal 1997). As juveniles move into benthic foraging areas a diet shift towards herbivory occurs. They consume primarily seagrasses and algae, but are also known to consume jellyfish, salps, and sponges (Bjorndal 1980, 1997; Paredes 1969; Mortimer 1981, 1982). The diving abilities of all sea turtles species vary by their life stages. The maximum diving range of green sea turtles is estimated at 110 m (360 ft) (Frick 1976), but they are most frequently making dives of less than 20 m (65 ft) (Walker 1994). The time of these dives also varies by life stage. The maximum dive length is estimated at 66 minutes with most dives lasting from 9 to 23 minutes (Walker 1994).

The hawksbill's pelagic stage lasts from the time they leave the nesting beach as hatchlings until they are approximately 22-25 cm in straight carapace length (Meylan 1988; Meylan and Donnelly 1999). The pelagic stage is followed by residency in developmental habitats (foraging areas where juveniles reside and grow) in coastal waters. Little is known about the diet of pelagic stage hawksbills. Adult foraging typically occurs over coral reefs, although other hard-bottom communities and mangrove-fringed areas are occupied occasionally. Hawksbills show fidelity to their foraging areas over several years (van Dam and Diez 1998). The hawksbill's diet is highly specialized and consists primarily of sponges (Meylan 1988). Gravid females have been noted ingesting coralline substrate (Meylan 1984) and calcareous algae (Anderes Alvarez and Uchida 1994), which are believed to be possible sources of calcium to aid in eggshell production. The maximum diving depths of these animals are not known, but the maximum length of dives is estimated at 73.5 minutes. More routinely, dives last about 56 minutes (Hughes 1974).

Leatherbacks are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean. Although they will enter coastal waters and are seen over the continental shelf on a seasonal basis to feed in areas where jellyfish are concentrated. Leatherbacks feed primarily on cnidarians (medusae, siphonophores) and tunicates. Unlike other sea turtles, leatherbacks' diets do not shift during their life cycles. Because leatherbacks' ability to capture and eat jellyfish is not constrained by size or age, they continue to feed on these species regardless of life stage (Bjorndal 1997). Leatherbacks are the deepest diving of all sea turtles. It is estimated that these species can dive in excess of 1000 m (Eckert et al. 1989) but more frequently dive to

depths of 50 m to 84 m (Eckert et al. 1986). Dive times range from a maximum of 37 minutes to more routine dives of 4 to 14.5 minutes (Standora et al. 1984, Eckert et al. 1986, Eckert et al. 1989, Keinath and Musick 1993). Leatherbacks may spend 74% to 91% of their time submerged (Standora et al. 1984).

Loggerheads are less common in the Caribbean region than in the Gulf of Mexico or South Atlantic regions. Loggerhead hatchlings forage in the open ocean and are often associated with *Sargassum* rafts (Hughes 1974, Carr 1987, Walker 1994, Bolten and Balazs 1995). The pelagic stage of these sea turtles are known to eat a wide range of things including salps, jellyfish, amphipods, crabs, syngnathid fish, squid, and pelagic snails (Brongersma 1972). Stranding records indicate that when pelagic immature loggerheads reach 40-60 cm straight carapace length they begin to live in coastal inshore and nearshore waters (Witzell 2002). Here they forage over hard- and soft-bottom habitats (Carr 1986). Benthic foraging loggerheads eat a variety of invertebrates with crabs and mollusks being an important prey source (Burke et al. 1993). Estimates of the maximum diving depths of loggerheads range from 211-233 m (692-764 ft.) (Thayer et al. 1984, Limpus and Nichols 1988). The lengths of loggerhead dives are frequently between 17 and 30 minutes (Thayer et al. 1984, Limpus and Nichols 1988, Limpus and Nichols 1994, Lanyan et al. 1989) and they may spend anywhere from 80-94 percent of their time submerged (Limpus and Nichols 1994, Lanyan et al. 1989).

Acropora, the only two species of acroporids in the Caribbean (i.e., *Acropora palmata* – Elkhorn coral and *Acropora cervicornis* – Staghorn coral), are two of the major reef-building corals in the wider Caribbean. Elkhorn colonies form flattened to near-round branches that typically radiate outward from a central trunk that is firmly attached to the sea floor. Staghorn colonies are stag antler-like, with cylindrical, straight, or slightly curved branches. The branching morphology of these species provides important habitat for other reef organisms. Historically, both acroporid species formed dense thickets at shallow (<5 m [<16 ft]) and intermediate (10 to 15 m [33 to 49 m]) depths in many reef systems, including locations in the Florida Keys, western Caribbean (e.g., Jamaica, Cayman Islands, Caribbean Mexico, Belize), and eastern Caribbean. In the 1960s and 1970s in the USVI, elkhorn coral was the main reef-building coral at depths less than 10 meters (33 ft) (Rogers et al. 2002). Elkhorn coral grew in nearly monospecific stands on the reef crest and in the upper and lower forereef zones of well-developed fringing and bank barrier reefs, as well as on isolated patch reefs (Rogers et al. 2002). The maximum range in depth reported for elkhorn coral is <1 to 30 m (<3.3 to 98 ft), but historic data for this coral in the USVI indicate that it was common at depths from 1 to 15 m (3.3 to 49 m) (Bacle 2002, Rogers et al. 2008). The preferred habitat of elkhorn coral is the seaward face of a reef (turbulent shallow water), including the reef crest, and shallow spur-and-groove zone (Shinn 1963, Cairns 1982, Rogers et al. 1982). Historically, staghorn coral was reported from depths ranging from <1 to 60 m (Goreau and Goreau 1973). It is suspected that 60 m (197 ft) is an extreme situation and that the coral is relatively rare below 20 m (66 ft) depth. The common depth range at which staghorn coral is currently observed is 5 to 17 m (16 to 56 ft). In the USVI, this species was abundant, but not

often found in dense thickets or well-defined zones (Rogers et al. 2002); unlike in areas in the western Caribbean where this species was historically the primary constructor of mid-depth (10 to 15 m [33 to 49 m]) reef terraces (Adey 1978).

On November 26, 2008, a final rule designating *Acropora* critical habitat was published in the *Federal Register* (FR 73 72210) and defined the physical or biological features essential to the conservation of the species (also known as essential feature). The essential features to the conservation of *Acropora* species is substrate of suitable quality and availability, in water depths from the mean high water line to 30 m (98 ft), to support successful larval settlement, recruitment, and reattachment of fragments. Substrate of suitable quality and availability means consolidated hardbottom or dead coral skeletons free from fleshy macroalgae or turf algae and sediment cover. Areas containing these features have been identified in the U.S. Caribbean include Puerto Rico, St. Thomas/St. John, and St. Croix (Figures 3.2.3.1 A and B).

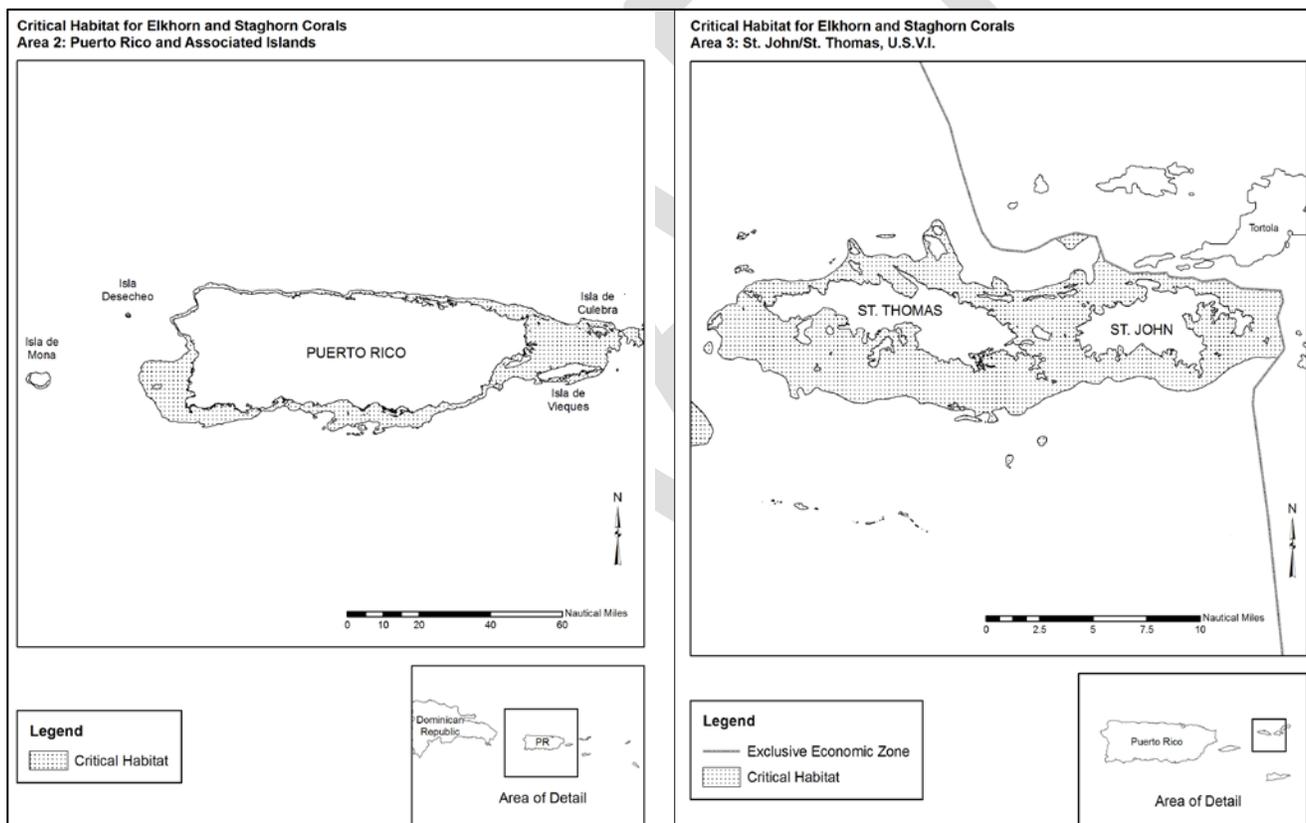


Figure 3.2.3.1 A. Designated Critical Habitat Areas 2 and 3 for Elkhorn and Staghorn Corals. Source: FR 73 72210; November 26, 2008.

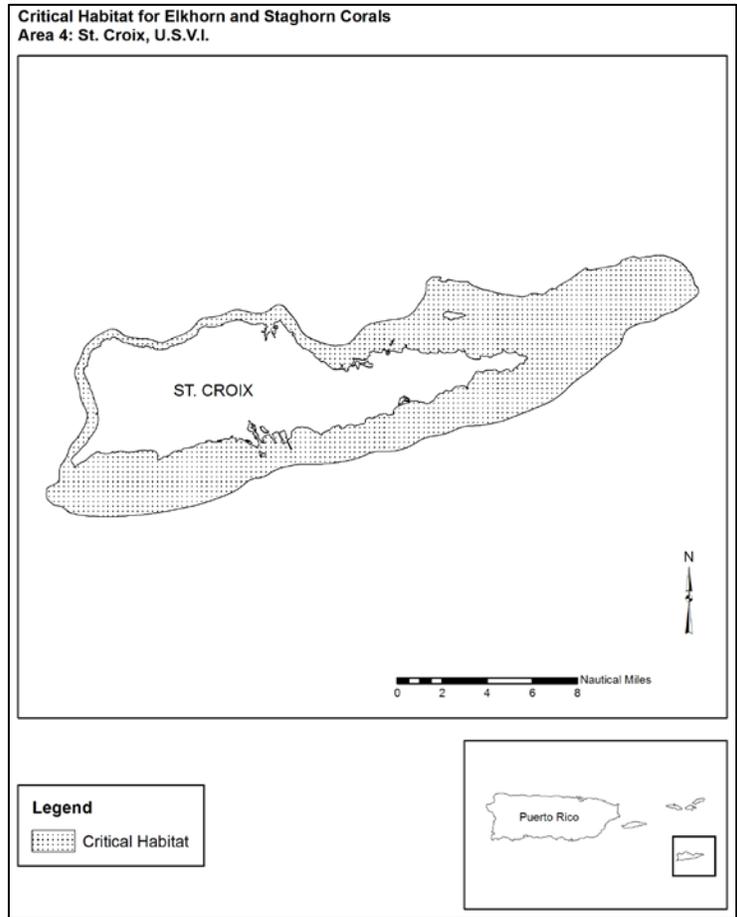


Figure 3.2.3.1 B. Designated Critical Habitat Area 4 for Elkhorn and Staghorn Corals.
Source: 73 FR 72210; November 26, 2008.

3.3 Description of the Fisheries

In-depth reviews of the commercial and recreational reef fish, spiny lobster, queen conch, and coral fisheries of the U.S. Caribbean are contained in the 2010 and 2011 Caribbean ACL Amendments (CFMC 2011a, b), and are incorporated herein by reference. A summary is provided below.

The fisheries of Puerto Rico and the USVI provide food, livelihoods, and income to Puerto Ricans and U.S. Virgin Islanders. The fisheries in the U.S. Caribbean (federal and state) waters can be divided into commercial, recreational, and subsistence. The commercial fisheries of both Puerto Rico and the USVI have been characterized as “artisanal⁷” because their commercial fishing vessels tend to be less than (and commonly much less than) 45 feet long, have small crews, participate in multiple fisheries, and yield smaller revenues, and their seafood processors are small-scale producers.

Fishing vessel permits are not required to commercially harvest any Council-managed species in federal waters of the U.S. Caribbean (CFMC 2013c). There are no federal licenses or permits issued for the recreational harvest of reef fish, queen conch, spiny lobster, or aquarium trade species in the EEZ of the U.S. Caribbean. However, a federal permit may be issued to take or possess Caribbean prohibited coral only as a scientific research activity, exempted fishing, or exempted education activity. Since 2010, all anglers fishing recreationally in U.S. Caribbean federal waters are required to be registered through the National Angler Registry (<https://www.countmyfish.noaa.gov/register/>). In addition, there are Highly Migratory Species (HMS) permit requirements that apply to the commercial and the recreational sector fishing in the U.S. Caribbean EEZ. For more information on the HMS permit requirements please visit http://www.nmfs.noaa.gov/sfa/hms/Compliance_Guide/index.htm. For more information about the permit requirements in federal and state waters, please see Section 3.5 of this document.

A detailed description of the fishing gears and methods used in the U.S. Caribbean reef fish, queen conch, spiny lobster, and coral fisheries is provided in the 2010 and in the 2011 Caribbean ACL Amendments (CFMC 2012a, b). Gears and methods used in the commercial fishery include hook-and-line, bottom lines, troll lines, rod and reel, longlines, SCUBA and skin diving, traps and pots, and nets (Matos-Caraballo and Agar 2008). Two of the most common gears used in the U.S. Caribbean recreational fishery are hook-and-line and SCUBA diving equipment (Griffith et al. 2007).

In the USVI, the number of licensed commercial fishermen registered in the Department of Planning and Natural Resources’ (DPNR) Division of Fish and Wildlife 2010-2011 registration

⁷ The NOAA Fisheries Glossary Revise Edition June 2006 defines artisanal fishery as a fishery based on traditional or small-scale gear and boats.

list was 214 (Kojis and Quinn 2012). There is no information available on the exact number of recreational fishers in the USVI. Tobias (2005) discusses that there are over 2,000 registered boats in the USVI and that approximately 10% of the population participate in recreational fishing activities. Ongoing development of a Marine Recreational Information Program will provide data on the recreational fisheries in the USVI.

In Puerto Rico, a survey by Matos-Caraballo and Agar in 2008 identified 868 active commercial fishermen. After completing the 2008 survey, Matos-Caraballo and Agar received an additional report in February of 2009 from the Puerto Rico Department of Natural and Environmental Resources (PRDNER), the agency responsible for the administration of the commonwealth fishing licenses, with a database of commercial fishing licenses showing 1,129 valid licenses. In 2011 and 2012, the number of commercial fishermen in Puerto Rico more than doubled (3,408) from that reported in 2009 (E. Piñeiro, personal communication). Historically, commercial fishermen in Puerto Rico were required by the PRDNER to show their tax return forms when applying for their commercial license. The PRDNER would use the tax forms to determine what amount of each fisher's income originated from commercial fishing. In 2011, the PRDNER put in place a moratorium eliminating the tax return requirement when applying for a commercial license. The moratorium appears to have triggered fishermen in the recreational sector to move to the commercial sector by applying for the Puerto Rico "commercial beginner's license." Obtaining this commercial license allows the recreational fishermen the use of additional fishing gears (e.g., bandit gear) and to sell their catch, both of which are prohibited practices under a recreational license. In 2013, the PRDNER reinstated the tax form requirement for commercial fishermen, and also created a limited entry system for snappers, which was the reef fish complex most affected by this change.

The number of recreational fishermen in Puerto Rico appears to vary substantially from year to year. For example, an estimated 250,000 fishers participated in 1991 whereas in 2007 the estimated number of participants fell between 160,000 and 170,000 (Griffith et al. 2007). However, until more consistent annual estimates of recreational fishing activity are obtained, long-term trajectories of growth (or shrinkage) cannot be discerned.

For more information regarding U.S. Caribbean Fisheries please see Section 3.4.2 (Description of the Social and Cultural Environment).

3.4 Economic and Social Environment

3.4.1 Economic Environment

3.4.1.1 Economic Description of the Puerto Rico and U.S. Virgin Islands Commercial and Recreational Fishing Industries

Commercial Fisheries

The data presented here for commercial fisheries comes from individual trip reports. All tables reporting landings are in whole pounds. Landings come from state and federal waters. Species groups/complex categories are ACL unit categories. When the data shows that less than three vessels landed poundage for a particular category, the data is confidential and this is indicated in the table and explained in the notes at the bottom of the table. The 2012 data for Puerto Rico is incomplete and not included at this time.

Puerto Rico

Trips

Table 3.4.1.1.1 shows the change in number of commercial trips, pounds, and associated revenue over the period 2008-2011. Expanded landings are reported in the table. This is the number of pounds that were used to establish ACLs. Ex-vessel revenue was estimated based on the expanded pounds. The number of trips has not been expanded because there is no standard methodology for doing this.

In the past five years, the number of commercial fishing trips averaged approximately 54,000 trips annually, average landings were almost 3 million pounds (whole), and ex-vessel revenues averaged almost \$9 million (Table 3.4.1.1.1). Number of trips peaked in 2011 while pounds landed and ex-vessel revenue peaked in 2008 (see note below Table 3.4.1.1.1 for a possible explanation of this inconsistency).

Table 3.4.1.1.1. Annual Number of Commercial Trips, Landings, and Ex-Vessel Revenue for Puerto Rico, 2008-2011.

Year	Number of Trips	Landings (whole pounds)	Estimated Ex-Vessel Revenue (nominal U.S. dollars)
2008	52,724	3,356,620	9,214,051
2009	55,771	2,849,139	8,308,957
2010	48,810	2,812,295	8,640,913
2011	57,810	2,057,031	6,772,870
Average	53,779	2,768,771	8,763,315

Source: Southeast Fisheries Science Center, October 2013.

Note: While pounds have been expanded consistent with the approach taken in determining appropriate ACLs, the estimated ex-vessel revenue column was calculated using ex-vessel prices from reported landings and values. The reader should note that the number of trips have not been expanded but have been taken directly from the trip report data.

Table 3.4.1.1.2 and Figure 3.4.1.1.1 show the number of commercial trips by month for each year.

Table 3.4.1.1.2. Monthly Number of Commercial Trips for Puerto Rico, 2008-2011.

Month	2008	2009	2010	2011
January	4,758	4,770	4,397	4,521
February	4,908	4,616	4,492	4,148
March	4,736	4,874	4,717	4,423
April	4,632	4,273	3,650	5,004
May	5,204	4,663	4,723	5,246
June	4,593	5,571	4,667	5,299
July	4,852	4,864	3,876	5,407
August	4,987	4,657	4,220	4,923
September	4,024	4,609	3,460	5,075
October	3,714	5,131	3,521	4,791
November	3,280	4,105	3,481	4,886
December	3,036	3,638	3,606	4,087

Source: Southeast Fisheries Science Center, October 2013.

Note: The reader should note that the number of trips has not been expanded but have been taken directly from the trip report data.

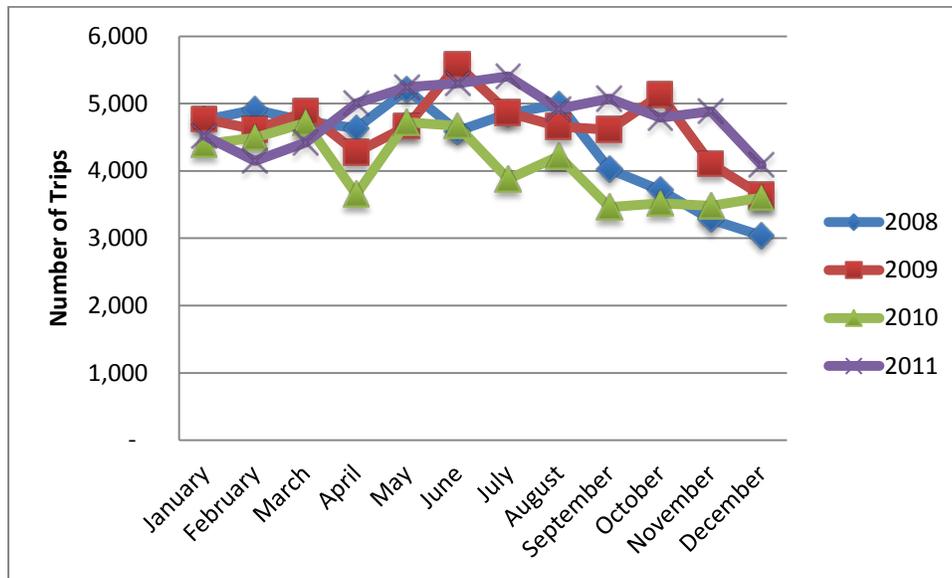


Figure 3.4.1.1.1. Monthly Number of Commercial Trips for Puerto Rico, 2008-2011.

Source: Southeast Fisheries Science Center, October 2013.

Table 3.4.1.1.3 shows the number of commercial trips by ACL unit where a species in the ACL unit was reportedly caught and retained. Spiny lobster, species in Snapper Unit 3, and queen conch were landed on the greatest number of commercial trips.

Table 3.4.1.1.3. Number of Commercial Trips by Species Group/Complex for Puerto Rico, 2008-2011.

Species Group/Complex	2008	2009	2010	2011	Average
AQUARIUM TRADE	0	9	5	2	5
BOXFISHES	2,536	2,868	2,490	2,765	2,665
GOATFISHES	326	395	328	335	346
GROUPERS	2,849	2,953	2,653	3,134	2,897
GRUNTS	2,050	2,362	1,833	1,321	1,892
JACKS	1,408	1,455	1,090	1,235	1,297
PARROTFISH UNIT	1,739	1,973	1,581	1,565	1,715
PORGIES	1,113	1,097	794	890	974
QUEEN CONCH	4,232	4,691	4,299	5,872	4,774
SNAPPER UNIT 1	2,489	2,171	2,276	2,811	2,437
SNAPPER UNIT 2	1,616	1,258	1,608	2,014	1,624
SNAPPER UNIT 3	5,347	5,846	5,235	5,644	5,518
SNAPPER UNIT 4	2,681	2,683	2,506	2,851	2,680
SNAPPER UNIT 5	2,004	2,402	1,906	2,002	2,079
SPINY LOBSTER	7,715	8,429	7,247	9,270	8,165
SQUIRRELFISHES	499	414	515	478	477
TILEFISHES	0	0	3	0	3
TRIGGERFISHES AND FILEFISHES	2,190	2,366	2,018	2,834	2,352

Species Group/Complex	2008	2009	2010	2011	Average
WRASSES	2,735	3,057	2,453	3,109	2,839
Without an ACL	8,696	8,894	7,621	9,142	8,588
Total	52,225	55,323	48,461	57,274	53,321

Source: Southeast Fisheries Science Center, October 2013.

Landings and Revenue

Table 3.4.1.1.4 shows annual landings by ACL unit and Table 3.4.1.1.5 shows annual revenue by ACL unit for Puerto Rico for 2008-2011. Both tables rely on estimates of expanded pounds used in the calculation of ACLs.

Table 3.4.1.1.4. Annual Commercial Landings by Species Group/Complex for Puerto Rico, 2008-2011.

Species Group/Complex	Landings (whole pounds)			
	2008	2009	2010	2011
BOXFISHES	51,397	58,979	57,310	40,326
GOATFISHES	5,215	9,656	6,459	6,812
GROUPERS	87,738	87,135	92,162	59,715
GRUNTS	69,575	84,537	65,601	39,954
JACKS	104,498	88,385	67,589	35,528
PARROTFISH UNIT	90,450	54,555	43,909	38,154
PORGIES	28,328	23,539	15,693	19,655
QUEEN CONCH	242,041	273,309	273,459	235,759
SNAPPER UNIT 1	352,975	369,179	276,528	149,268
SNAPPER UNIT 2	261,998	239,977	384,877	218,854
SNAPPER UNIT 3	175,321	148,127	174,108	167,303
SNAPPER UNIT 4	365,868	222,698	215,404	151,284
SNAPPER UNIT 5	54,523	47,426	52,909	38,317
SPINY LOBSTER	329,227	322,992	289,609	274,318
SQUIRRELFISHES, TILEFISH, AQUARIUM TRADE	19,430	10,485	8,995	6,744
TRIGGERFISHES AND FILEFISHES	55,361	47,194	45,650	50,714
WRASSES	54,980	67,187	59,427	53,623
Without an ACL	1,007,695	693,779	682,606	470,703
Total	3,356,620	2,849,139	2,812,295	2,057,031

Source: Southeast Fisheries Science Center, October 2013.

Note: Aquarium Trade Species, Tilefish, and Squirrelfish ACL Units have been combined to address confidentiality concerns.

Table 3.4.1.1.5. Annual Commercial Ex-Vessel Revenue by Species Group/Complex for Puerto Rico, 2008-2011.

Species Group/Complex	Landings (whole pounds)			
	2008	2009	2010	2011
BOXFISHES	\$104,766	\$121,334	\$179,359	\$84,313
GOATFISHES	\$12,253	\$23,255	\$15,187	\$15,655
GROUPERS	\$202,817	\$197,213	\$196,067	\$149,090
GRUNTS	\$116,275	\$153,204	\$121,077	\$71,317
JACKS	\$164,239	\$146,064	\$108,802	\$63,435
PARROTFISH UNIT	\$159,176	\$102,835	\$82,435	\$67,917
PORGIES	\$50,938	\$46,358	\$30,960	\$34,975
QUEEN CONCH	\$970,671	\$1,137,173	\$1,197,285	\$1,074,275
SNAPPER UNIT 1	\$1,166,354	\$1,207,688	\$1,006,479	\$572,148
SNAPPER UNIT 2	\$895,698	\$734,028	\$1,284,240	\$876,104
SNAPPER UNIT 3	\$405,110	\$339,553	\$404,493	\$415,400
SNAPPER UNIT 4	\$856,011	\$512,215	\$491,382	\$366,640
SNAPPER UNIT 5	\$125,252	\$110,095	\$119,198	\$87,824
SPINY LOBSTER	\$2,005,652	\$1,983,041	\$1,779,014	\$1,702,703
SQUIRRELFISHES, TILEFISH, AQUARIUM TRADE	\$29,304	\$17,516	\$15,103	\$10,712
TRIGGERFISHES AND FILEFISHES	\$95,066	\$84,314	\$75,983	\$79,206
WRASSES	\$161,632	\$192,382	\$172,716	\$160,746
Without an ACL	\$1,692,837	\$1,200,689	\$1,361,132	\$940,410
Total	\$9,214,051	\$8,308,957	\$8,640,913	\$6,772,870

Source: Southeast Fisheries Science Center, October 2013.

Note: Aquarium Trade, Tilefish, and Squirrelfish ACL Units have been combined to address confidentiality concerns.

Table 3.4.1.1.6 and Figure 3.4.1.1.2 show monthly landings for 2008-2011. Table 3.4.1.1.7 and Figure 3.4.1.1.3 show monthly ex-vessel revenue for 2008-2011. These figures were not replicated by ACL unit because of confidentiality issues for species with lower landings.

Table 3.4.1.1.6. Monthly Commercial Landings (whole pounds) for Puerto Rico, 2008-2011.

Month	2008	2009	2010	2011
Jan	274,570	300,683	251,954	158,306
Feb	320,682	347,776	280,790	133,528
March	325,607	288,208	299,723	154,072
April	303,847	242,505	224,999	179,797
May	339,977	240,133	253,713	182,967
June	310,821	267,524	255,259	179,123
July	342,423	215,254	211,204	183,384

Month	2008	2009	2010	2011
August	327,310	182,084	227,455	163,741
Sept	238,450	213,080	214,881	178,360
Oct	223,993	224,086	231,397	182,025
Nov	189,878	190,379	174,999	200,848
Dec	159,062	137,427	185,921	160,880

Source: Southeast Fisheries Science Center, October 2013.

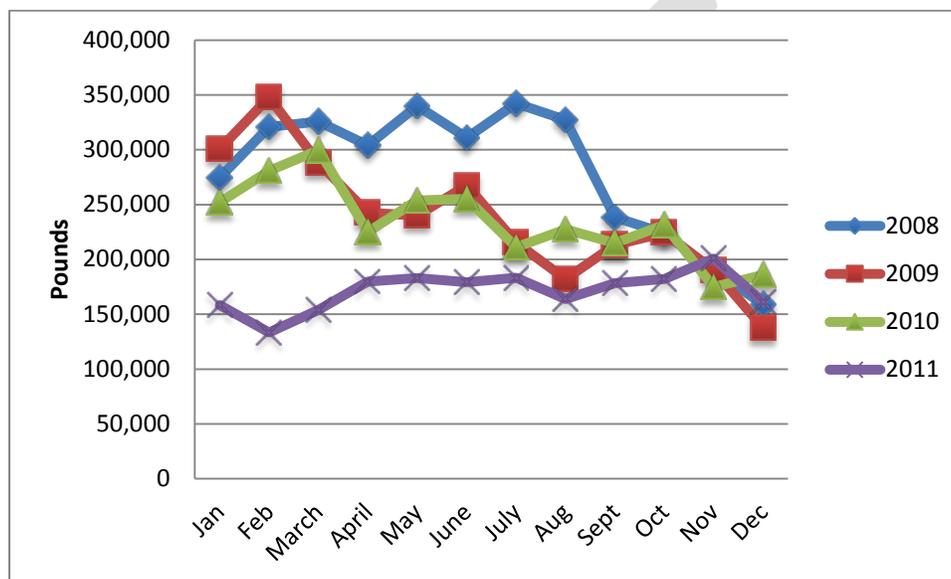


Figure 3.4.1.1.2. Monthly Commercial Landings (whole pounds) for Puerto Rico, 2008-2011.
Source: Southeast Fisheries Science Center, October 2013.

Table 3.4.1.1.7. Monthly Commercial Ex-Vessel Revenue for Puerto Rico (nominal weighted U.S. dollars), 2008-2011.

Month	2008	2009	2010	2011
Jan	\$753,705	\$1,046,008	\$1,023,580	\$1,155,147
Feb	\$880,284	\$983,471	\$1,062,521	\$959,593
March	\$893,804	\$948,945	\$1,174,767	\$1,017,934
April	\$834,072	\$875,165	\$817,415	\$1,255,260
May	\$933,250	\$824,051	\$968,719	\$1,335,427
June	\$853,216	\$935,944	\$1,003,427	\$1,341,812
July	\$939,964	\$748,035	\$730,554	\$1,369,285
Aug	\$898,478	\$738,394	\$815,685	\$1,158,888
Sept	\$654,554	\$757,723	\$721,305	\$1,288,400
Oct	\$614,869	\$865,408	\$880,476	\$1,221,301
Nov	\$521,222	\$708,044	\$1,008,248	\$1,402,296
Dec	\$436,631	\$664,824	\$783,518	\$1,124,177

Source: Southeast Fisheries Science Center, October 2013.

Note: The monthly and annual estimated ex-vessel revenues for all species landed contained in Tables 3.4.1.1.7 and 3.4.1.1.9 were calculated using the weighted average annual price derived from an ex-vessel revenue raw data not shown here which contains revenue and pounds harvested by species. The weighted average annual price was determined by the proportion of each species in the total landings. For example, assume only two species were harvested, species X, which had an average price per pound of \$4 and constituted 75% of total landings, and species Y, which had an average price per pound of \$1 and constituted 25% of total landings. The weighted average price across both species would be equal to \$3.25 $((0.75 * \$4) + (0.25 * \$1))$. In Table 3.4.1.1.7, the same weighted average price per year is used for each month.

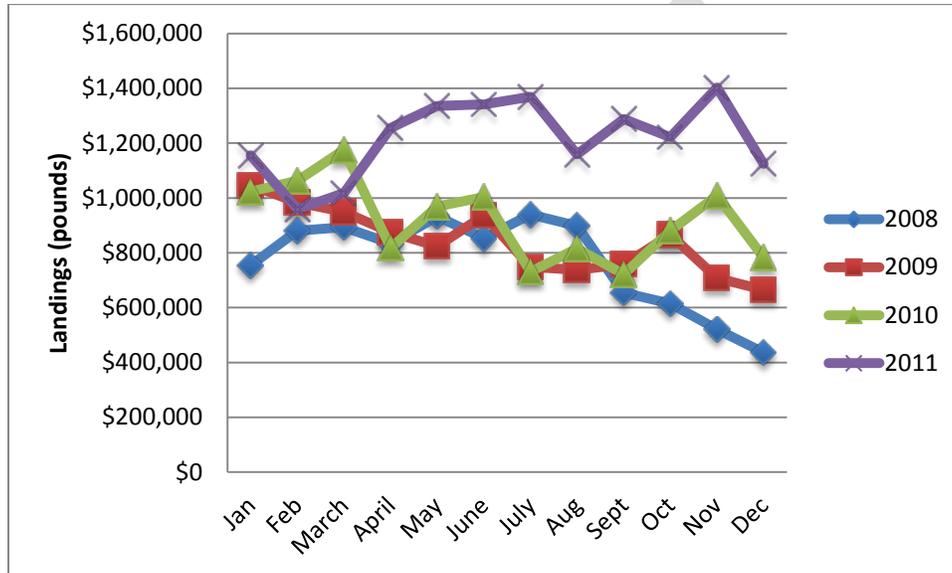


Figure 3.4.1.1.3. Monthly Commercial Ex-Vessel Revenue (nominal weighted U.S. dollars) for Puerto Rico, 2008-2011. Source: Southeast Fisheries Science Center, October 2013.

Note: Ex-vessel revenue was calculated using monthly expanded pounds for each year multiplied by weighted annual ex-vessel prices for each ACL unit to get an ex-vessel price estimate for the year. See note above (Table 3.4.1.1.7) for a full explanation.

Gear Usage

Tables 3.4.1.1.8 and 3.4.1.1.9 show landings and ex-vessel revenue, respectively, by gear type for 2008-2011. Bottom hook and line and diving have been used to bring in the most landings and ex-vessel revenue.

Table 3.4.1.1.8. Annual Commercial Landings (whole pounds) by Gear Type for Puerto Rico, 2008-2011.

Gear Type	2008	2009	2010	2011
BY HAND, DIVING GEAR	675,003	670,655	669,554	540,473

Gear Type	2008	2009	2010	2011
CAST NETS	120,184	47,167	60,504	26,822
GILL NETS, OTHER	270,235	174,462	156,844	127,655
HAUL SEINES	8,707	47,342	32,643	43,603
HOOK AND LINE	32,735	24,420	6,103	1,131
HOOK AND LINE, BOTTOM	1,652,593	1,069,068	1,305,273	813,901
LONG LINES, BOTTOM	24,382	12,165	58,737	27,794
POTS AND TRAPS	11,055	8,244	13,164	8,958
POTS AND TRAPS, FISH	285,659	335,339	279,940	241,096
TRAPS, SPINY LOBSTER	39,875	36,478	45,308	68,576
SPEARS	0	0	0	69,207
TRAMMEL NETS	34,268	177,990	45,921	14,879
TROLL LINES	201,924	245,809	138,204	72,936

Source: Southeast Fisheries Science Center, October 2013.

Table 3.4.1.1.9. Annual Commercial Ex-Vessel Revenue (nominal U.S. dollars) by Gear Type for Puerto Rico, 2008-2011.

Gear Type	2008	2009	2010	2011
BY HAND, DIVING GEAR	\$1,856,258	\$1,958,313	\$2,055,531	\$1,778,156
CAST NETS	\$330,506	\$137,728	\$185,747	\$88,244
GILL NETS, OTHER	\$743,146	\$509,429	\$481,511	\$419,985
HAUL SEINES	\$23,944	\$138,239	\$100,214	\$143,454
HOOK AND LINE	\$90,021	\$71,306	\$18,736	\$3,721
HOOK AND LINE, BOTTOM	\$4,544,631	\$3,121,679	\$4,007,188	\$2,677,734
LONG LINES, BOTTOM	\$67,051	\$35,522	\$180,323	\$91,442
POTS AND TRAPS	\$30,401	\$24,072	\$40,413	\$29,472
POTS AND TRAPS, FISH	\$785,562	\$979,190	\$859,416	\$793,206
POTS AND TRAPS, SPINY LOBSTER	\$109,656	\$106,516	\$139,096	\$225,615
SPEARS	\$0	\$0	\$0	\$227,691
TRAMMEL NETS	\$94,237	\$519,731	\$140,977	\$48,952
TROLL LINES	\$555,291	\$717,762	\$424,286	\$239,959

Source: Southeast Fisheries Science Center, October 2013.

Note: Ex-vessel revenue was calculated using monthly expanded pounds for each year multiplied by weighted annual ex-vessel prices for each ACL unit to get an ex-vessel price estimate for the year. See above note (Table 3.4.1.1.7) for a full explanation.

St. Thomas and St. John

Vessels and Trips

Figure 3.4.1.1.4 shows the number of active vessels for 2008-2012. An active vessel is a vessel that reported landing at least some poundage of fish during a given year. It is possible to show the number of vessels because vessel ID numbers are distributed as part of the licensing procedure in St. Thomas and St. John. The average number of active vessels from 2008-2012 was 104 vessels while the average number of inactive vessels was 84. A total of 188 vessels landed at least some poundage of fish between 2008-2012.

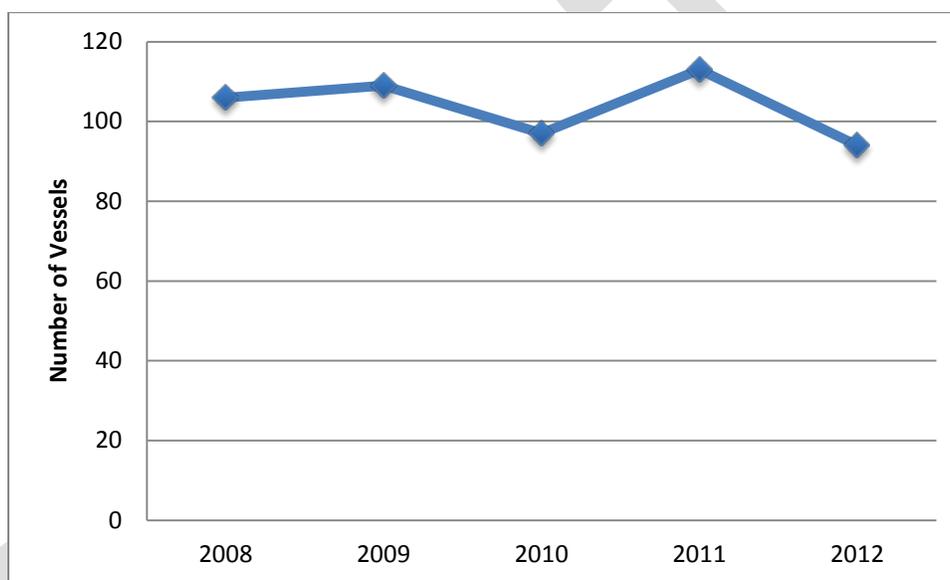


Figure 3.4.1.1.4. Annual Number of Active Commercial Vessels in St. Thomas/St. John, 2008-2012.
Source: Southeast Fisheries Science Center, October 2013.

Table 3.4.1.1.10 shows the number of trips with landings from each ACL unit from 2008-2012.

Table 3.4.1.1.10. Number of Commercial Trips Reporting Landings by Species Group/Complex in St. Thomas/St. John, 2008-2012.

Species Unit/Complex	2008	2009	2010	2011	2012
ANGELFISHES	426	465	504	988	1,216
BOXFISHES	1,751	1,664	1,435	1,128	979
GOATFISHES	18	16	5	2	1
GROUPERS	1,635	1,735	1,650	1,763	1,884
GRUNTS	1,887	1,828	1,695	1,481	1,306
JACKS	642	713	532	403	409
PARROTFISH UNIT	1,679	1,666	1,587	1,600	1,627

Species Unit/Complex	2008	2009	2010	2011	2012
PORGIES	1,747	1,750	1,585	726	38
QUEEN CONCH	26	40	29	52	15
SNAPPER UNIT 1	0	0	0	151	419
SNAPPER UNIT 2	0	0	0	2	5
SNAPPER UNIT 3	0	0	0	447	648
SNAPPER UNIT 4	0	0	0	446	842
SNAPPERS	2,701	2,941	2,608	1,077	1
SPINY LOBSTER	1,435	1,387	1,256	1,089	1,076
SQUIRRELFISHES	272	256	218	553	966
SURGEONFISHES	1,873	1,819	1,694	1,367	1,248
TRIGGERFISH&FILEFISHES	1,965	1,914	1,771	1,501	1,429
WRASSES	51	70	148	160	176
Without an ACL	1,196	1,552	1,164	1,340	1,642
Total	19,304	19,816	17,881	16,276	15,928

Source: Southeast Fisheries Science Center, October 2013.

Note: The count of vessels submitting a trip report acts as a proxy for the number of trips since the trip report for St. Thomas/St. John does not ask for number of trips.

Landings and Revenue

Tables 3.4.1.1.11 and 3.4.1.1.12 show annual landings and ex-vessel revenue by ACL unit from 2008-2012. From 2008 to 2012, landings declined 43% from almost 691,000 pounds in 2008 to approximately 390,000 pounds in 2012. Revenue declined nearly 26% from approximately \$3 million to \$2.3 million over the same time period. In 2012, the largest poundage caught was in the spiny lobster, snappers, triggerfishes and filefishes, jacks and groupers ACL units, in that order. In 2012, spiny lobster was the highest revenue grossing species followed by snappers, groupers, triggerfishes and filefishes, and jacks, in that order.

Table 3.4.1.1.11. Annual Commercial Landings (whole pounds) by Species Group/Complex in St. Thomas/St. John, 2008-2012.

Species Group/Complex	2008	2009	2010	2011	2012
ANGELFISHES	8,365	9,077	10,586	18,337	16,047
BOXFISHES	33,008	30,323	25,813	15,757	12,288
GROUPERS	56,910	68,602	60,806	53,170	41,184
GRUNTS	39,144	36,557	38,407	25,402	16,102
JACKS	56,197	68,478	46,043	35,049	45,523
PARROTFISH UNIT	39,613	33,049	34,010	23,289	17,224
PORGIES	22,287	21,603	20,387	8,498	144
QUEEN CONCH	857	1,329	1,577	1,930	592
SNAPPER UNIT 1	NA	NA	NA	3,783	9,934
SNAPPER UNIT 2	NA	NA	NA	conf	156

Species Group/Complex	2008	2009	2010	2011	2012
SNAPPER UNIT 3	NA	NA	NA	7,449	10,539
SNAPPER UNIT 4	NA	NA	NA	18,266	32,993
SNAPPERS	145,187	143,615	121,186	46,740	conf
SPINY LOBSTER	110,465	115,762	114,577	84,302	83,138
SQUIRRELFISHES	3,792	3,045	2,366	6,510	9,805
SURGEONFISHES	37,407	31,718	31,927	19,294	15,078
TRIGGERFISHES AND FILEFISHES	84,131	79,469	79,555	57,067	45,989
WRASSES AND GOATFISH	759	1,453	2,569	1,976	1,824
Without an ACL	52,449	65,063	51,954	41,937	31,834
Total	690,496	709,049	641,712	468,740	390,391

Source: Southeast Fisheries Science Center, October 2013.

Note: Goatfish and Wrasses ACL units have been combined to address confidentiality concerns. The term “conf” denotes a confidentiality issue.

Table 3.4.1.1.12. Annual Commercial Revenue (nominal U.S. dollars) by Species Group/Complex in St. Thomas/St. John, 2008-2012.

Species Group/Complex	2008	2009	2010	2011	2012
ANGELFISHES	\$33,460	\$32,777	\$31,761	\$55,022	\$48,163
BOXFISHES	\$198,045	\$129,478	\$107,295	\$64,475	\$51,631
GROUPERS	\$227,641	\$388,728	\$353,110	\$319,028	\$247,111
GRUNTS	\$156,577	\$166,050	\$183,286	\$135,639	\$93,379
JACKS	\$224,788	\$292,590	\$191,998	\$159,677	\$227,618
PARROTFISH UNIT	\$158,451	\$141,105	\$141,021	\$104,509	\$86,132
PORGIES	\$89,149	\$86,411	\$81,549	\$34,007	\$837
QUEEN CONCH	\$5,142	\$8,926	\$10,663	\$13,510	\$4,144
SNAPPER UNIT 1	NA	NA	NA	\$22,695	\$59,603
SNAPPER UNIT 2	NA	NA	NA	conf	\$936
SNAPPER UNIT 3	NA	NA	NA	\$44,691	\$63,237
SNAPPER UNIT 4	NA	NA	NA	\$109,595	\$197,960
SNAPPERS	\$580,747	\$828,673	\$711,368	\$280,442	conf
SPINY LOBSTER	\$662,788	\$845,199	\$819,733	\$629,243	\$665,102
SQUIRRELFISHES	\$15,168	\$10,677	\$10,272	\$24,895	\$38,899
SURGEONFISHES	\$149,628	\$135,483	\$132,150	\$85,446	\$75,395
TRIGGERFISHES AND FILEFISHES	\$336,523	\$339,543	\$329,875	\$255,026	\$229,952
WRASSES AND GOATFISH	\$5,091	\$9,075	\$12,850	\$11,327	\$10,943
Without an ACL	\$224,976	\$282,438	\$208,434	\$212,567	\$170,942
Total	\$3,068,174	\$3,697,153	\$3,325,365	\$2,561,920	\$2,272,041

Source: Southeast Fisheries Science Center, October 2013.

Note: Goatfish and Wrasses ACL units have been combined to address confidentiality concerns. The term “conf” denotes a confidentiality issue.

Table 3.4.1.1.13 shows the annual number of vessels landings various pound ranges for 2008-2012. In St. Thomas/St. John, there were similar numbers of active and inactive (no landings at all) vessels from 2008-2012. Approximately 67% of active vessels harvested less than 5,000 pounds in 2012. Almost 22% harvested over 10,000 pounds with the remainder harvesting 5,000 to 10,000 pounds.

Table 3.4.1.1.13. Annual Number of Commercial Vessels Landing Various Ranges of Pounds in St. Thomas/St. John, 2008-2012.

Landings Ranges	2008	2009	2010	2011	2012
No landings (inactive vessels)	83	80	92	76	95
1 - 99	4	5	6	4	7
100 - 499	17	16	15	21	16
500 - 999	17	12	8	15	15
1,000 - 4,999	31	37	35	42	33
5,000 - 9,999	14	16	14	19	12
10,000 - 14,999	8	11	8	7	5
15,000 - 19,999	8	4	2	2	2
20,000 - 24,999	3	1	4	0	3
25,000 - 29,999	1	4	1	2	0
30,000 +	3	3	4	1	1
Total active vessels	106	109	97	113	94

Source: Southeast Fisheries Science Center, October 2013.

Gear Usage

Tables 3.4.1.1.14 and 3.4.1.1.15 show landings and ex-vessel revenue, respectively, by gear type for 2008-2012.

Table 3.4.1.1.14. Annual Commercial Landings (whole pounds) by Gear Type in St. Thomas/St. John, 2008-2012.

Gear	2008	2009	2010	2011	2012
Castnet	2,568	2,202	2,836	681	0
Free Diving	3,218	4,939	2,948	1,829	0
HAND	0	0	0	3,409	944
HL_HAND	0	0	0	22,797	45,306
HL_POW_REEL	0	0	0	2,871	2,971
HL_TROLL	0	0	0	1,076	0
HL_UNK	0	0	0	256	9,030
Line Fishing	116,821	132,920	100,752	43,322	0

Gear	2008	2009	2010	2011	2012
NET_CAST	0	0	0	532	536
NET_SEINE	0	0	0	19,192	33,689
NET_UNK	0	0	0	2,638	9,167
SCUBA	6,767	9,713	4,777	3,589	2,716
Seine Net	84,183	95,608	62,979	16,576	0
Trammel Net, Longline, HL_DLL, HL_BOTTOM, Gillnet, GILL_NET_SURFACE	691	191	340	288	590
TRAP_FISH	0	0	0	98,888	177,636
TRAP_LOB	0	0	0	13,510	40,716
TRAP_UNK	0	0	0	50,531	67,098
Traps	475,648	460,812	455,459	174,268	0
Total	689,614	706,194	629,751	455,965	389,809

Source: Southeast Fisheries Science Center, October 2013.

Note: Several gear categories had confidentiality issues. These categories (Trammel Net, Longline, HL_DLL, HL_BOTTOM, Gillnet, GILL_NET_SURFACE) were combined for this reason.

Table 3.4.1.15. Annual Commercial Ex-Vessel Revenue (nominal U.S. dollars) by Gear Type in St. Thomas/St. John, 2008-2012.

Gear	2008	2009	2010	2011	2012
Castnet	\$10,272	\$7,737	\$10,703	\$2,043	\$0
Free Diving	\$13,634	\$21,659	\$13,379	\$8,824	\$0
HAND	\$0	\$0	\$0	\$17,244	\$5,527
HL_HAND	\$0	\$0	\$0	\$129,160	\$255,655
HL_POW_REEL	\$0	\$0	\$0	\$18,766	\$17,945
HL_TROLL	\$0	\$0	\$0	\$6,782	\$0
HL_UNK	\$0	\$0	\$0	\$1,533	\$54,314
Line Fishing	\$483,089	\$694,983	\$534,201	\$239,456	\$0
NET_CAST	\$0	\$0	\$0	\$2,676	\$2,754
NET_SEINE	\$0	\$0	\$0	\$104,090	\$178,970
NET_UNK	\$0	\$0	\$0	\$13,003	\$48,505
SCUBA	\$33,053	\$56,421	\$28,127	\$21,559	\$16,979
Seine Net	\$338,097	\$465,819	\$308,313	\$77,946	\$0
Trammel Net, Longline, HL_DLL, HL_BOTTOM, Gillnet, GILL_NET_SURFACE	\$2,864	\$573	\$1,020	\$1,633	\$3,120
TRAP_FISH	\$0	\$0	\$0	\$522,670	\$934,788
TRAP_LOB	\$0	\$0	\$0	\$105,516	\$322,291
TRAP_UNK	\$0	\$0	\$0	\$312,563	\$431,193
Traps	\$2,184,465	\$2,435,377	\$2,368,174	\$904,652	\$0
Total	\$3,068,174	\$3,697,153	\$3,325,365	\$2,561,920	\$2,272,041

Source: Southeast Fisheries Science Center, October 2013.

Note: Several gear categories had confidentiality issues. These categories (Trammel Net, Longline, HL_DLL, HL_BOTTOM, Gillnet, GILL_NET_SURFACE) were combined for this reason.

St. Croix

Vessels and Trips

Figure 3.4.1.1.5 shows the number of active vessels in St. Croix. An active vessel is a vessel that made at least some amount of landings in a particular year. The number of active vessels decreased 24% from 137 in 2008 to 104 in 2012. An average of 129 vessels was active over the five-year period while an average of 167 was inactive (did not land any poundage in one of the five years). A total of 296 vessels were active in at least one of the five years.

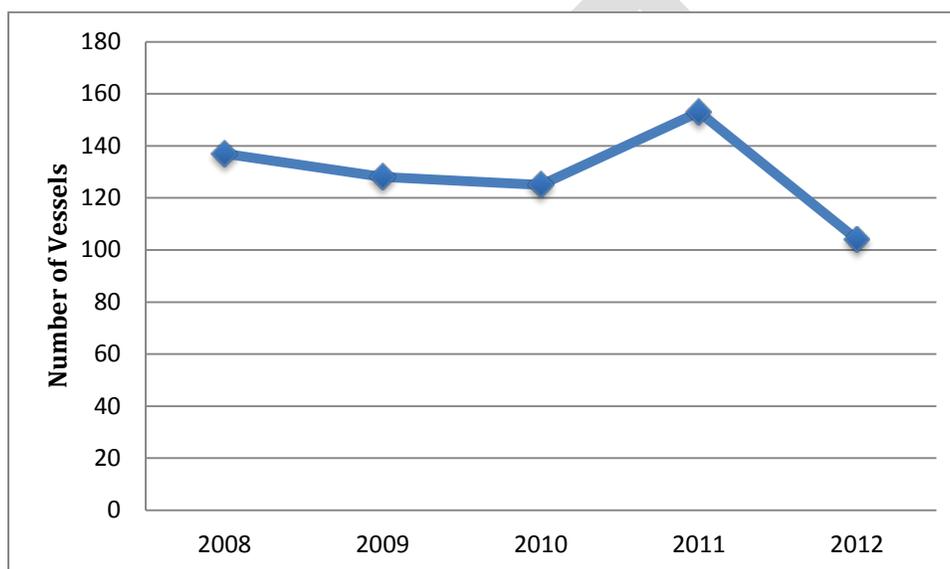


Figure 3.4.1.1.5. Annual Number of Commercial Active Vessels in St. Croix, 2008-2012.
Source: Southeast Fisheries Science Center, October 2013.

Table 3.4.1.1.16 shows the number of trips landings at least some poundage of each of the ACL units.

Table 3.4.1.1.16. Annual Number of Commercial Trips Reporting Landings for Each Species Group/Complex in St. Croix, 2008-2012.

Species Group/Complex	2008	2009	2010	2011	2012
ANGELFISHES	11	13	87	810	1,441
AQUARIUM TRADE	0	0	0	7	11
BOXFISHES	892	912	458	385	272
GOATFISHES	204	268	94	147	141
GROUPERS	1,642	2,026	1,743	2,156	2,454
GRUNTS	2,875	3,617	2,624	2,659	2,318
JACKS	352	405	328	278	349

Species Group/Complex	2008	2009	2010	2011	2012
PARROTFISH UNIT	4,459	4,552	3,211	4,241	5,369
PORGIES	539	429	427	302	41
QUEEN CONCH	1,936	1,038	1,410	1,062	721
SNAPPER UNIT 1	0	0	0	463	651
SNAPPER UNIT 2	0	0	0	126	145
SNAPPER UNIT 3	0	0	0	1,156	2,634
SNAPPER UNIT 4	0	0	0	345	609
SNAPPERS	3,754	3,713	3,196	1,720	0
SPINY LOBSTER	3,578	3,820	3,383	2,449	2,042
SQUIRRELFISHES	16	10	1	88	99
SURGEONFISHES	2,511	2,938	2,156	2,376	1,936
TRIGGERFISHES AND FILEFISHES	2,387	2,863	2,059	1,819	1,547
WRASSES	0	0	0	4	3
Without an ACL	2,815	2,521	2,031	1,887	1,439
Total	27,971	29,125	23,208	24,480	24,222

Source: Southeast Fisheries Science Center, October 2013.

Note: The count of vessels submitting a trip report acts as a proxy for the number of trips since the trip report for St. Croix does not ask for number of trips.

Landings and Revenue

Tables 3.4.1.1.17 and 3.4.1.1.18 show the annual landings and ex-vessel revenue by ACL unit, respectively, over the period 2008 to 2012. An average 770,000 pounds were landed and an average of \$7 million in ex-vessel revenues (nominal) was earned from 2008 to 2012. Landings dropped almost 51% from 2008 to 2012 while revenues dropped 44% over the five-year period. In 2012, the parrotfish ACL unit provided the greatest amount of landings followed by spiny lobster and queen conch ACL units. Spiny lobster, parrotfish, and queen conch ACL units provided the greatest amount of ex-vessel revenues in 2012, in that order.

Table 3.4.1.1.17. Annual Commercial Landings (whole pounds) by Species Group/Complex in St. Croix, 2008-2012.

Species Group/Complex	2008	2009	2010	2011	2012
ANGELFISHES	63	99	815	8,510	14,253
AQUARIUM TRADE	0	0	0	82	128
BOXFISHES	8,268	7,418	4,302	5,335	1,819
GOATFISHES	1,775	2,678	541	712	529
GROUPERS	29,585	34,650	29,117	30,800	29,853
GRUNTS	39,836	46,789	32,514	34,418	24,761
JACKS	8,715	11,881	12,358	10,341	8,355
PARROTFISH UNIT	354,997	316,094	162,623	154,531	118,798
PORGIES	5,694	4,249	5,189	2,698	146
QUEEN CONCH	123,681	71,557	81,917	53,210	36,771

Species Group/Complex	2008	2009	2010	2011	2012
SNAPPER UNIT 1	0	0	0	8,975	23,139
SNAPPER UNIT 2	0	0	0	2,730	4,036
SNAPPER UNIT 3	0	0	0	14,123	30,922
SNAPPER UNIT 4	0	0	0	4,711	9,400
SNAPPERS	112,389	96,393	92,354	55,946	
SPINY LOBSTER	148,003	149,908	139,685	109,751	86,917
SURGEONFISHES	38,127	37,274	29,645	32,187	21,231
TRIGGERFISHES AND FILEFISHES	32,698	38,735	30,711	26,464	22,644
WRASSES AND SQUIRRELFISH	77	32	7	795	623
Without an ACL	134,944	123,628	99,116	88,859	77,111
Total	1,038,850	941,382	720,886	645,177	511,434

Source: Southeast Fisheries Science Center, October 2013.

Note: Squirrelfish and Wrasses ACL Units have been combined to address confidentiality concerns.

Table 3.4.1.1.18. Annual Commercial Ex-Vessel Revenue (nominal) by Species Group/Complex in St. Croix, 2008-2012.

Species Group/Complex	2008	2009	2010	2011	2012
ANGELFISHES	\$252	\$333	\$2,445	\$25,530	\$42,759
AQUARIUM TRADE	\$0	\$0	\$0	\$152	\$239
BOXFISHES	\$33,070	\$31,709	\$17,784	\$21,969	\$7,619
GOATFISHES	\$8,875	\$13,631	\$2,723	\$3,838	\$3,174
GROUPERS	\$177,509	\$196,413	\$169,873	\$184,801	\$179,119
GRUNTS	\$159,342	\$212,401	\$156,611	\$185,293	\$143,660
JACKS	\$34,860	\$50,770	\$51,699	\$47,879	\$41,781
PARROTFISH UNIT	\$1,419,986	\$1,350,469	\$668,775	\$674,523	\$593,989
PORGIES	\$22,776	\$16,995	\$18,607	\$8,773	\$847
QUEEN CONCH	\$742,086	\$480,422	\$557,276	\$372,473	\$257,395
SNAPPER UNIT 1	\$0	\$0	\$0	\$53,855	\$138,837
SNAPPER UNIT 2	\$0	\$0	\$0	\$16,379	\$24,220
SNAPPER UNIT 3	\$0	\$0	\$0	\$84,740	\$185,534
SNAPPER UNIT 4	\$0	\$0	\$0	\$28,263	\$56,401
SNAPPERS	\$674,334	\$556,284	\$546,535	\$335,675	\$0
SPINY LOBSTER	\$1,184,022	\$1,094,800	\$994,685	\$806,001	\$695,338
SQUIRRELFISHES AND WRASSES	\$308	\$116	28	\$3,265	\$2,532
SURGEONFISHES	\$152,508	\$159,207	\$121,678	\$143,541	\$106,155
TRIGGERFISHES AND FILEFISHES	\$130,792	\$165,503	\$126,246	\$115,323	\$113,220
Without an ACL	\$724,620	\$671,549	\$556,011	\$503,581	\$470,223
Total	\$5,465,340	\$5,000,602	\$3,990,976	\$3,615,854	\$3,063,042

Source: Southeast Fisheries Science Center, October 2013.

Note: Squirrelfish and Wrasses ACL Units have been combined to address confidentiality concerns.

Table 3.4.1.1.19 shows the annual number of vessels landings various pound ranges for 2008-2012. In St. Croix, in all years except 2011, there were lower numbers of active vessels than inactive (no landings at all) vessels. Approximately 80% of active vessels harvested less than 5,000 pounds in 2012. Almost 14% harvested over 10,000 pounds with the remainder harvesting 5,000 to 10,000 pounds.

Table 3.4.1.1.19. Annual Number of Commercial Vessels Landing Various Pound Ranges in St. Croix, 2008-2012.

Pound Ranges	2008	2009	2010	2011	2012
0	159	168	171	143	192
1 - 99	6	6	6	11	5
100 - 499	9	13	13	29	22
500 - 999	22	10	17	22	20
1,000 - 4,999	58	57	46	60	38
5,000 - 9,999	17	18	26	14	5
10,000 - 14,999	5	10	4	9	5
15,000 - 19,999	5	5	4	3	1
20,000 - 24,999	5	0	2	2	1
25,000 - 29,999	2	3	3	1	3
30,000 +	8	6	4	2	4
ACTIVE VESSELS	137	128	125	153	104

Source: Southeast Fisheries Science Center, October 2013.

Gear Usage

Tables 3.4.1.1.20 and 3.4.1.1.21 show the annual landings and ex-vessel revenue, respectively, by gear type for 2008-2012. SCUBA landings have provided the largest amount of landings and revenue (over half of all landings and revenue) in St. Croix with smaller amounts of various handline methods and trap fishing.

Table 3.4.1.1.20. Annual Commercial Landings (whole pounds) by Gear Type in St. Croix, 2008-2012.

Gear	2008	2009	2010	2011	2012
Castnet	13,084	5,019	531	0	0
Free Diving	329,096	57,021	1,720	8,399	0
HAND	0	0	0	17,792	27,870
HL_DLL	0	0	0	0	737
HL_HAND	0	0	0	27,266	69,031
HL_LL	0	0	0	5,243	10,992
HL_POW_REEL	0	0	0	conf	5,135
HL_UNK	0	0	0	1,599	4,249
Line Fishing	186,253	174,304	140,501	78,697	0
NET_CAST	0	0	0	1,806	3,363

Gear	2008	2009	2010	2011	2012
NET_SEINE	0	0	0	6,929	2,612
NET_UNK	0	0	0	925	2,567
SCUBA	326,282	595,281	461,930	367,326	298,116
Seine Net	55,199	17,415	14,622	8,830	0
TRAP_FISH	0	0	0	37,179	65,464
TRAP_LOB, Net_Gill, Longline, HL_Troll, HL_Buoy, Gillnet, Gill_Net_Surface	8,621	3,118	2,495	2,520	12,098
TRAP_UNK	0	0	0	6,706	9,201
Traps	120,314	89,072	87,919	55,351	0
Total	1,038,850	941,382	720,893	645,177	511,434

Source: Southeast Fisheries Science Center, October 2013.

Note: Diving, Gill_Net_Surface, Gillnet, HL_Buoy, HL_Troll, longline, Net_Gill, and Trap_lob gears were combined to address confidentiality issues. The term “conf” denotes a confidentiality issue.

Table 3.4.1.1.21. Annual Commercial Ex-Vessel Revenue (nominal U.S. dollars) by Gear Type in St. Croix, 2008-2012.

Gear	2008	2009	2010	2011	2012
Castnet	\$73,512	\$28,437	\$2,873	\$0	\$0
Free Diving	\$1,631,528	\$299,360	\$11,629	\$47,604	\$0
HAND	\$0	\$0	\$0	\$107,614	\$171,765
HL_DLL	\$0	\$0	\$0	\$0	\$4,500
HL_HAND	\$0	\$0	\$0	\$173,757	\$432,716
HL_LL	\$0	\$0	\$0	\$71,004	\$71,004
HL_POW_REEL	\$0	\$0	\$0	\$30,007	\$29,696
HL_UNK	\$0	\$0	\$0	\$10,078	\$26,153
Line Fishing	\$1,060,065	\$986,209	\$808,450	\$453,823	\$0
NET_CAST	\$0	\$0	\$0	\$9,030	\$16,816
NET_SEINE	\$0	\$0	\$0	\$34,649	\$13,060
NET_UNK	\$0	\$0	\$0	\$4,633	\$12,835
SCUBA	\$1,885,457	\$3,158,209	\$2,566,492	\$2,033,888	\$1,778,420
Seine Net	\$227,221	\$61,373	\$57,087	\$29,374	\$0
TRAP_FISH	\$0	\$0	\$0	\$208,939	\$385,824
TRAP_LOB, Net_Gill, Longline, HL_Troll, HL_Buoy, Gillnet, Gill_Net_Surface	\$42,366	\$13,340	\$13,531	\$13,916	\$66,452
TRAP_UNK	\$0	\$0	\$0	\$39,947	\$53,801
Traps	\$545,191	\$452,737	\$465,330	\$295,088	\$0
Total	\$5,465,340	\$5,000,602	\$3,990,976	\$3,615,854	\$3,063,042

Source: Southeast Fisheries Science Center, October 2013.

Note: Diving, Gill_Net_Surface, Gillnet, HL_Buoy, HL_Troll, longline, Net_Gill, and Trap_lob gears were combined to address confidentiality issues.

For more information see economic descriptions of the USVI commercial and recreational fishing industries in the 2010 Caribbean ACL Amendment (CFMC 2011a) and the 2011 Caribbean ACL Amendment (CFMC 2011b). The economic description information contained in these amendments is incorporated herein by reference.

Recreational Fishery

This section presents information from the Marine Recreational Information Program (MRIP) from the NOAA Office of Science and Technology website found at:

<http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/index>.

Puerto Rico

In 2012, 94,000 marine recreational participants took 351,000 trips and caught a total of 526,000 fish. The most commonly caught non-bait species (in numbers of fish) were dolphinfish, silk snapper, anchovy family, lane snapper, and blue runner. By weight, the largest harvests were dolphinfish, wahoo, common snook, tripletail, great barracuda, and king mackerel (Fisheries of the U.S., 2012).

Catch and Harvest

Table 3.4.1.1.22 shows the number of fish harvested and released through recreational fishing.

Table 3.4.1.1.22. Total Recreationally Harvested and Released Numbers of Fish in Puerto Rico, 2008-2012.

Year	Harvested	Released
2008	1,341,257	176,930
2009	663,590	119,179
2010	392,624	156,115
2011	387,316	58,980
2012	477,730	48,664

Source: Marine Recreational Information Program (MRIP) (<http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/index>)

Effort (Angler Trips)

Table 3.4.1.1.23 shows the total number of angler trips in Puerto Rico while Table 3.4.1.1.24 breaks down the number of angler trips by mode (shore, charter boat, and private/rental boat).

Table 3.4.1.1.23. Total Recreational Angler Trips in Puerto Rico, 2008-2012.

Year	Angler Trips
2008	798,551
2009	636,151
2010	536,183
2011	424,587
2012	350,568

Source: Marine Recreational Information Program (MRIP) (<http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/index>)

Table 3.4.1.1.24. Total Recreational Angler Trips by Mode in Puerto Rico, 2008-2012.

Year	Shore	Charter Boat	Private/Rental Boat
2008	423,190	12,622	362,739
2009	345,584	2,610	287,957
2010	219,651	4,113	312,419
2011	232,917	4,730	186,939
2012	140,266	1,839	208,462

Source: Marine Recreational Information Program (MRIP) (<http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/index>)

Participation

Table 3.4.1.1.25 shows individual participation in recreational fishing in Puerto Rico.

Table 3.4.1.1.25. Recreational Participation by Region (individuals) in Puerto Rico, 2008-2012.

Year	Coastal Resident	Out of State
2008	127,863	21,681
2009	110,236	22,352
2010	92,191	11,096
2011	98,662	13,795
2012	83,837	10,003

Source: Marine Recreational Information Program (MRIP) (<http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/index>)

Economic Value and Expenditures

There is no information at this time regarding economic value and expenditures of recreational fishing in the U.S. Caribbean.

Summary

In general, there has been a downward trend in harvest, releases, number of trips and recreational fishing participation since 2008. The reason for this could be the increase in diesel prices and/or the downturn in the economy, which could result in less expenditure on recreational fishing.

U.S. Virgin Islands

Please refer to the amendments above for information about the USVI recreational fisheries. While no MRIP program is in place, there has been some academic and territorial research on recreational fisheries and these are discussed in previous amendments.

3.4.2 Description of the Social and Cultural Environment

Descriptions of the social environment of reef fish, queen conch, spiny lobster, and coral fisheries are included in CFMC (2011a) and CMFC (2011b) and are incorporated by reference. In addition, detailed descriptions of the social environment of specific fisheries are included in recent amendments including CFMC (2013b) (Queen Conch FMP) and CFMC (2013a) (Reef Fish FMP) and are incorporated herein by reference.

This comprehensive amendment proposes changes to the reef fish, coral, queen conch, and spiny lobster FMPs (including snappers, groupers, spiny lobster, boxfish, goatfish, grunts, wrasses, jacks, scups and porgies, squirrelfish, triggerfish and filefish, tilefish, angelfish, surgeonfish, parrotfish, queen conch, and aquarium trade species). Therefore, this section includes a description of fishermen and fishing communities in Puerto Rico and the USVI in relation to their involvement in the included fisheries. Additional fisheries not managed by the Caribbean Council (such as highly migratory species) are also included in the narrative, in order to provide context on the dependence on Council-managed species. For recent commercial and recreational landings of the FMUs or species in the reef fish, coral, queen conch, and spiny lobster FMPs, the reader is directed to refer to Tables 2.2.1.1.1-2.2.1.1.5 in Section 2.1.1.1. Also, additional narratives on the impacted fisheries, which can be used to supplement this section, are included in Section 3.3 (Description of the Fisheries) of this document.

Data are presented at the community level, when possible, in order to meet the requirements of National Standard 8 (NS 8) of the Magnuson-Stevens Act. NS8 requires the consideration of the importance of fishery resources to human communities when changes in fishing regulations are considered. For the following analysis, the majority of data are presented at the island, commonwealth, or territory level because these data are not available at the place-based community level of analysis.

Puerto Rico Fishing Community

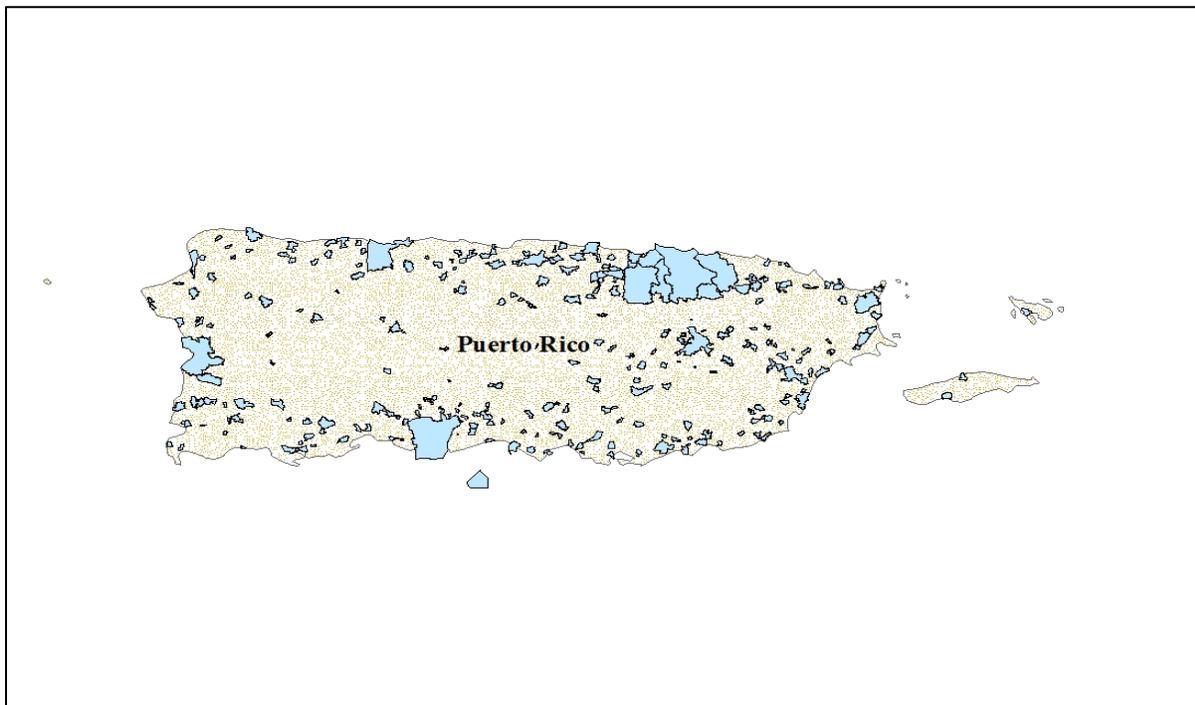


Figure 3.4.2.1. Map of Puerto Rico with census designated places.
Source: NMFS SERO Fisheries Social Science Branch, M. Jepson.

Fishing traditions in coastal communities in Puerto Rico are visible through the celebration of the Virgen del Carmen, the patron saint of fishers, which derives from the fishing and maritime tradition of Spain. In addition, more recent traditions are visible through the Festival Del Pescao (Seafood Festival) in Cabo Rojo, a festival which was created during the 1970s and occurs during Lent. Fish are important and culturally significant to the Puerto Rican diet. Fish are particularly important among Catholics during Lent, which includes one of the most brisk seasons for seafood sales. Fish is both a high-priced food enjoyed by tourists and coastal visitors and a low-cost and high quality protein which is sold to working people (Griffith et al. 2007).

As with most island coastal economies, there are three main types of fisheries in Puerto Rico: commercial, recreational, and subsistence. The commercial sector is responsible for the majority of landings. Puerto Rico's commercial fishery has been referred to as "artisanal" and can be considered small-scale and family-based (Griffith et al. 2007). Most fishing operations are multi-gear and multi-species according to Griffith et al. (2007) with nearly two-thirds utilizing at least three gear types. A number of different gear types are used by Puerto Rican fishermen, including: handline, rod and reel, longline, bottomline, fish traps, lobster traps, gill nets,

trammel nets, cast nets and SCUBA gear (Matos-Caraballo and Agar 2011). There seems to be an increase in the use of SCUBA gear in the commercial fisheries.

According to a recent census, there were approximately 868 active commercial fishermen in Puerto Rico in 2008 (Matos-Caraballo and Agar 2011). This number is highly contested though, as pointed out in Griffith et al. (2007), and in the past even a range of 1,500 to 2,500 has been suggested too low by fishermen. The confusion may be attributed to what an active fisherman is considered to be. Nevertheless, the number, as reported in that census, decreased from an earlier census conducted in 1988 when there were over 1,700 fishermen or the 2003 census which counted 1,132. Nearly 75 percent of fishermen reported that they worked full-time as fishermen; whereas 25 percent reported that they worked part-time as fishermen and held other occupations or received retirement benefits (Matos-Caraballo and Agar 2011). Recently, as reported in Section 3.3.1, in 2011 and 2012, the number of commercial fishermen in Puerto Rico more than doubled (3,408) from the number reported in 2009. The increase in the number of commercial fishermen was likely due to the moratorium on the historical requirement to submit tax forms to be used by PRDNER to determine the amount of income a fisher derived from commercial fishing. This moratorium on the requirement to show tax forms when applying for a commercial license was put in place in 2011; however the tax requirement was re-instated in 2013.

Out of the 868 commercial fishermen interviewed in a recent census, reef fish was the top category in terms of importance with 77.3 percent of respondents targeting reef fish (Table 3.4.2.1) (Matos-Caraballo and Agar 2011). Deepwater snapper was the second most commonly targeted category (55.5%), and spiny lobster was the third (49.3%). Ornamental fish were targeted to a lesser degree with only 1.6 percent of fishermen reporting that they targeted ornamental fish (Table 3.4.2.1). The number of fishermen targeting specific species varied by coastal region with top species (species targeted by more than half of respondents) for the north coast including reef fish (88.3%), deep-water snapper (71.6%), and pelagic species (65.4%). Whereas, top species for the east coast included reef fish (75.5%), deep-water snapper (71.6%), pelagic species (66.5%) and spiny lobster (64.5%). Along the south coast, the top species were reef fish (88.0%) and spiny lobster (57.1%). Along the west coast of Puerto Rico, the top species were reef fish (64.8%) and deep-water snapper (51.3%, Table 3.4.2.1).

Table 3.4.2.1. Target species by coastal region. Source: Matos-Caraballo and Agar (2011).

Percentage of fishermen who target the following species	North Coast	East coast	South coast	West coast	Puerto Rico
Reef fish	88.3%	75.5%	88.0%	64.8%	77.3%
Deep-water snapper	71.6%	71.6%	39.5%	51.3%	55.5%
Pelagic species	65.4%	66.5%	30.0%	26.4%	41.8%
Spiny lobster	27.8%	64.5%	57.1%	47.2%	49.3%
Queen conch	13.0%	34.8%	45.1%	34.6%	33.4%
Baitfish	53.1%	32.9%	30.9%	17.9%	30.7%
Octopus	1.9%	0.0%	19.3%	1.3%	6.0%
Sirajo goby	8.0%	0.0%	0.9%	0.0%	1.7%
Land crab	9.3%	10.3%	6.0%	2.2%	6.0%
Ornamental fish	0.6%	1.9%	0.9%	2.5%	1.6%

Puerto Rico fishermen target multiple species and a variety of species are important to each municipality. Rarely, did more than one to two species account for more than 10 percent of the landings in a specific municipality, and in many cases the third most important species listed accounted for less than 10 percent of the landings (Tables 3.4.2.2).

Table 3.4.2.2. Three most important species by municipality, 1999-2003. Percentages of landings by species are included as the numerical value. Source: Griffith et al. (2007).

Municipality	1 st Species	2 nd Species	3 rd Species
San Juan	Yellowtail Snapper 15.0	Jacks 8.0	Lane Snapper 6.4
Cataño	Jacks 7.9	Mojarras 6.9	White Grunt 5.5
Toa Baja	Jacks 7.9	Mojarras 6.9	White Grunt 5.5
Mayagüez	Yellowtail Snapper 12.6	Lane Snapper 11.1	King Mackerel 7.5
Añasco	Silk Snapper 41.0	Lane Snapper 9.6	Lobster 6.0
Rincón	Queen Snapper 28.6	Silk Snapper 25.1	Dolphin 5.1
Ponce	Yellowtail Snapper 18.1	Lane Snapper 13.5	Snappers (generic) 9.1
Juana Díaz	Lobster 32.2	Lane Snapper 17.5	Other fishes 7.5
Santa Isabel	Lane Snapper 22.2	Lobster 9.3	Yellowtail and Mutton Snappers 8.7
Salinas	Lane Snapper 15.7	Yellowtail and Mutton Snappers 9.5	White Grunt/Lobster 9.0
Guayama	Lobster 9.0	White Grunt 8.4	Lane Snapper 8.3

Municipality	1st Species	2nd Species	3rd Species
Patillas	Lobster 11.8	Lane Snapper 6.8	Parrotfish 6.0
Arroyo	Parrotfish 15.1	Lobster 10.4	Ballyhoo 7.0
Peñuelas	Lobster 26.0	Hogfish 16.3	Octopus 11.6
Guayanilla	White Grunt 12.1	Mutton Snapper 8.6	Lane Snapper 8.4
Guánica	Lobster 14.0	Yellowtail Snapper 12.0	Hogfish 9.0
Isabela	Lobster 20.7	Nasau Grouper 14.1	Silk Snapper 12.1
Camuy	Yellowtail Snapper 18.1	Mutton Snapper 10.5	King Mackerel 9.2
Arecibo	Silk Snapper 32.9	King Mackerel 8.7	Lobster 8.0
Barceloneta	Silk Snapper 14.3	Triggerfish 8.8	Lane Snapper 7.1
Manatí	Herrings 5.7	White Mullet 5.6	Jacks 4.9
Vega Baja	Silk Snapper 10.2	Red Hind 7.4	Bar Jack 5.7
Vega Alta	Silk Snapper 10.3	Bar Jack 6.4	Red Hind 6.2
Dorado	Silk Snapper 10.0	Triggerfish 6.8	Schoolmaster 6.4
Carolina	Jacks 8.0	White Mullet 7.6	Yellowtail Snapper 7.6
Loíza	Silk Snapper 10.5	Vermilion Snapper 8.5	Yellowtail Snapper 6.6
Rio Grande	Yellowtail Snapper 11.1	Vermilion Snapper 9.9	White Grunt 9.3
Luquillo	White Grunt 10.3	Lane Snapper 7.2	King Mackerel 6.2
Fajardo	Yellowtail Snapper 17.9	Lobster 7.7	King Mackerel 5.4
Ceiba	White Grunt 12.5	Lobster 7.7	Boxfishes 5.4
Vieques	Lobster 15.4	Yellowtail Snapper 8.7	Triggerfish 6.5
Culebra	Nasau Grouper 17.2	Lobster 15.4	Triggerfish 15.1
Naguabo	Lobster 18.7	1 st class fish 16.1	3 rd class fish 13.7
Humacao	Lobster 13.7	Yellowtail Snapper 9.3	White Grunt 7.8
Yabucoa	Yellowtail Snapper 12.7	Lane Snapper 10.8	White Grunt 10.8
Maunabo	Lane Snapper 12.3	White Grunt 11.9	Lobster 9.3
Lajas	Lobster 8.2	White Grunt 7.8	Lane Snapper 6.5
Cabo Rojo	Lobster 17.8	Boxfishes 9.8	Lane Snapper 6.7
Aguada	Silk Snapper 13.0	Skipjack Tuna 8.5	King Mackerel 7.6
Aguadilla	Silk Snapper 12.9	Skipjack Tuna 10.0	King Mackerel 9.9

Puerto Rico's recreational fishermen range from charter boat captains to individuals who fish with a can, line and a hook. As of March 9, 2010, there were 582 recreational (including subsistence) fishermen in Puerto Rico registered with the National Angler Registry. As reported in Section 3.4.1.1, a total of 94,000 marine recreational participants embarked on 351,000 fishing

trips in 2012. The majority of trips were taken using a private or rental boat (59.5%), followed by shore mode (40%), and charter boat (0.5%, Tables 3.4.1.1.23-24). Coastal residents made up the majority of participation in the marine recreational sector (89.3% in 2012); whereas a smaller portion of recreational participation included those from other states (10.7%, Table 3.4.1.1.25).

Subsistence fishing in Puerto Rico is primarily a working class family activity and they see fish as a source of high quality protein for their family (Griffith et al. 2007). They do differ in some respects from other sectors with regard to key aspects, in that they may often be retired or unemployed (Griffith et al. 2007). Subsistence fishermen target snapper-grouper species (40%) and pelagic species including species such as dolphin (7.4%) and king mackerel (5.9%), but nearly no shellfish. The varieties of gear used by subsistence fishers are similar to those of recreational fishers; however few use SCUBA gear (Griffith et al. 2007). It is clear that many Puerto Ricans participate in subsistence fishing. However, without more detailed research, it is difficult to know how pervasive this activity is on the island or their household's dependence upon fish as a food source.

Griffith et al. (2007) found that in terms of fishing communities there were both place-based and network-based communities in Puerto Rico. Although fishermen were spread out considerably across the island, there were certain locations that seemed to provide key features of a place-based fishing community including fishing infrastructure and social interactions on a daily basis. Overall, they were able to identify 38 place-based fishing communities on the island (Griffith et al. 2007).

St. Croix Fishing Community

Fishing on the island of St. Croix has a long history as with the other islands. Historically, it has been a “marginal” activity to the larger backdrop of other economic sectors on the island. However, fishing has been a core value and important to the identity of the Cruzan population (Valdés-Pizzini et. al 2010).

Commercial fishing on St. Croix is much like that of Puerto Rico in that is “artisanal.” Most fishermen construct and repair their gear and boats, as well as market their fish (Kojis and Quinn 2012; Valdés-Pizzini et. al 2010). The number of commercial fishers is elusive as in Puerto Rico but recent estimates place the number of active fishermen in the range of 200-250. This does not include those who may provide support services for registered fishermen or those who may not be registered to fish (Valdés-Pizzini et. al 2010).

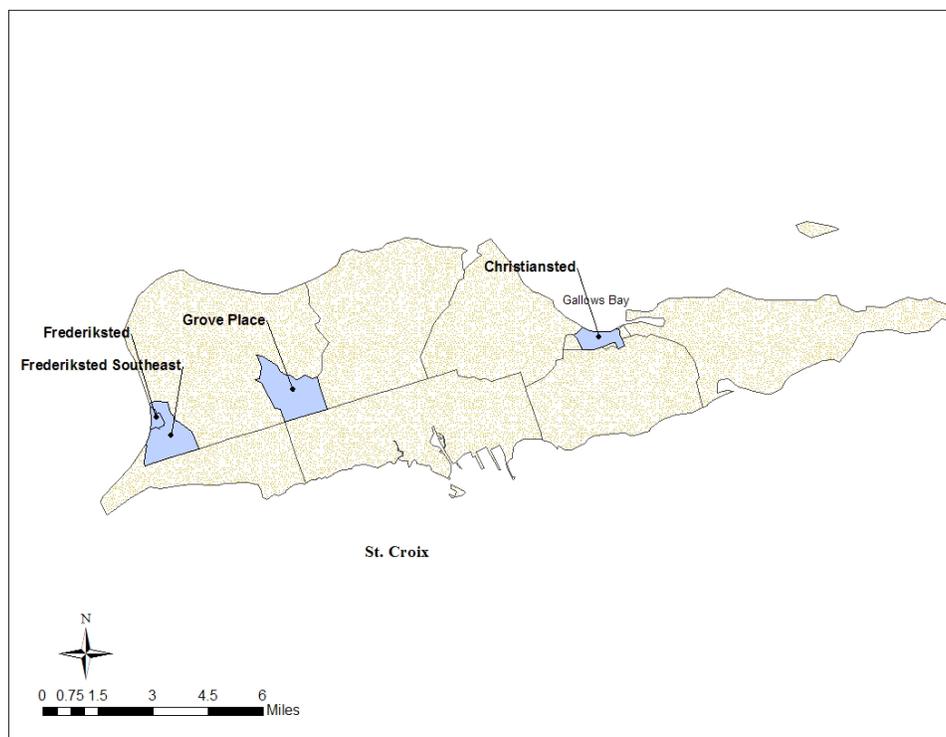


Figure 3.4.2.2. Map of St. Croix with census designated places.
 Source: NMFS SERO Fisheries Social Science Branch, M.Jepson.

The majority of St. Croix commercial fishermen classify themselves as Hispanic with the next largest ethnic group identified as West Indian. The most frequent racial designation is Black. Most are full-time fishermen putting in over 36 hours a week (Kojis and Quinn 2012), however, the percentage may be lower than other islands and may be linked to perceptions of the current state of the fisheries. Many seek work outside of fishing, as it is increasingly difficult to make a living from that particular occupation (Valdés-Pizzini et. al 2010); however it has been reported that it is difficult for fishermen to find other employment (58.2% of fishermen interviewed indicated it was very hard or hard to find other employment, (Kojis and Quinn 2012)). Many fishers hold other occupations in addition to fishing, termed occupational multiplicity. These fishers continue to fish in addition to their other occupations and intend to continue to engage in fishing for as long as they are physically capable (Grace-Mccaskey 2012).

The dominant gear type used is hook and line with diving second. Trap fishing is third, but many fishermen indicated that they fish several gear types throughout the year (Kojis and Quinn 2012). Vessels are usually small and hauled on trailers transported to different parts of the island according to the type of fishery prosecuted seasonally.

Licensed fishermen land their fish at many landing locations around the island (16 different locations on St. Croix were reported by interviewed fishermen); however, the top three most

important landing sites were Altona Lagoon in Christiansted, the Molasses Pier, and Frederiksted Fish Market (Kojis and Quinn 2012). St. Croix fishermen commonly market their fish themselves (Kojis and Quinn 2012).

Commonly in St. Croix, commercial fishermen keep part of their catch to be consumed by their families for subsistence. Fishermen also commonly give away part of their catch to friends to be used for their subsistence (Kojis and Quinn 2012).

A variety of species are caught by commercial fishermen in St. Croix and fishermen commonly target more than one category of fish. Out of the 154 fishermen interviewed in a recent census, reef fish was the top category in terms of importance with 79.9 percent of respondents targeting reef fish (Table 3.4.2.3). Spiny lobster was the second most commonly targeted category with 57.8 percent of interviewed fishermen targeting spiny lobster and queen conch was the fourth most commonly targeted category with 57.8 percent of fishermen targeting spiny lobster (Table 3.4.2.3).

Table 3.4.2.3. Relative importance of categories of fish, mollusks, and crustaceans to St. Croix interviewed licensed commercial fishers. Frequency includes the number of fishermen who answered that they harvest a particular category. Percentages can equal more than 100 % because fishermen harvested more than one category. Source: Kojis and Quinn (2012).

Categories of Fish	Frequency	Percent
Reef fish	123	79.9%
Coastal pelagic	48	31.2%
Deep pelagic	74	48.1%
Deepwater snapper	58	37.7%
Bait fish	10	6.5%
Queen conch	65	42.2%
Whelk/West Indian top shell	20	13.0%
Spiny lobster	89	57.8%
Total # of fishers	154	316.2%

Most of the deepwater snapper are fished off the Eastern and Southeastern end of the Island, while the major trap grounds are off the southwestern part of the island according to Valdes-Pizzini et al. (2010). Dive fishing occurs most on the East End and along the southern shore which are the most productive fishing grounds and the focus of conservation initiatives (Valdes-Pizzini et al. 2010).

While there has been limited research on the recreational fishing sector of St. Croix, a few reports provide a brief glimpse of related activities. In one survey of fishing clubs, tuna, dolphin, and wahoo were identified as the primary target species of recreational fishermen from St. Croix (Messineo and Uwate 2004). Valdés-Pizzini et al. (2010) report that about 11% of St. Croix residents participate in recreational fishing although because they are not required to have a license. The charter fishing and sport fishing tournaments are becoming increasingly important to the St. Croix economy, but the St. Croix offshore fleet is modest compared that of St. Thomas and St. John (Valdés-Pizzini et al. 2010).

In terms of fishing communities on the island, it seems to be the consensus of Valdés-Pizzini et al. (2010) that the geographical dispersion of fishermen throughout the island and the same dispersion of their fishing activities make it difficult to identify any particular community as a fishing community. Gallow Bay historically has been considered a fishing community, but has recently undergone significant change that now brings to question whether this area could be considered a fishing community. There are ties to the “roots” of commercial fishing, but day to day activities often hide the activities that link the community to fishing (Valdés-Pizzini et al. 2010). Fishermen in St. Croix do not typically live in areas that are close to the coast but instead tend to live along a “diagonal line that extends from the north to the southwest coinciding with the Centerline Road.” The current pattern of fishers’ residences is based on the historical factors such as the process of homesteading where the government provided land to farmers in order to try to revitalize the sugar industry (Valdés-Pizzini et al. 2010).

St. Thomas and St. John Fishing Community

Both commercial and recreational fishing are important aspects of the island economies of St. Thomas and St. John, although the tourism sector may significantly dwarf their contributions in terms of economic value. Still, there are important remnants of commercial fishing communities that exist on the islands and newer spaces for recreational fishing that are growing in importance (IAI 2007). Whether they are fishing communities in the true sense or fishing activity is so spread across the island that the entire geography should be considered a fishing community, as has been suggested (Stoffle et al. 2011), is still undetermined.

Two areas where concentrations of commercial fishing activity are located on St. Thomas are the Northside and Southside of the island. Hull Bay on the Northside provides a protected area with a boat ramp where many commercial vessels are moored. Frenchtown on the Southside has docking facilities along with a covered market that has considerable activity throughout the week but especially on Saturdays (IAI 2007).

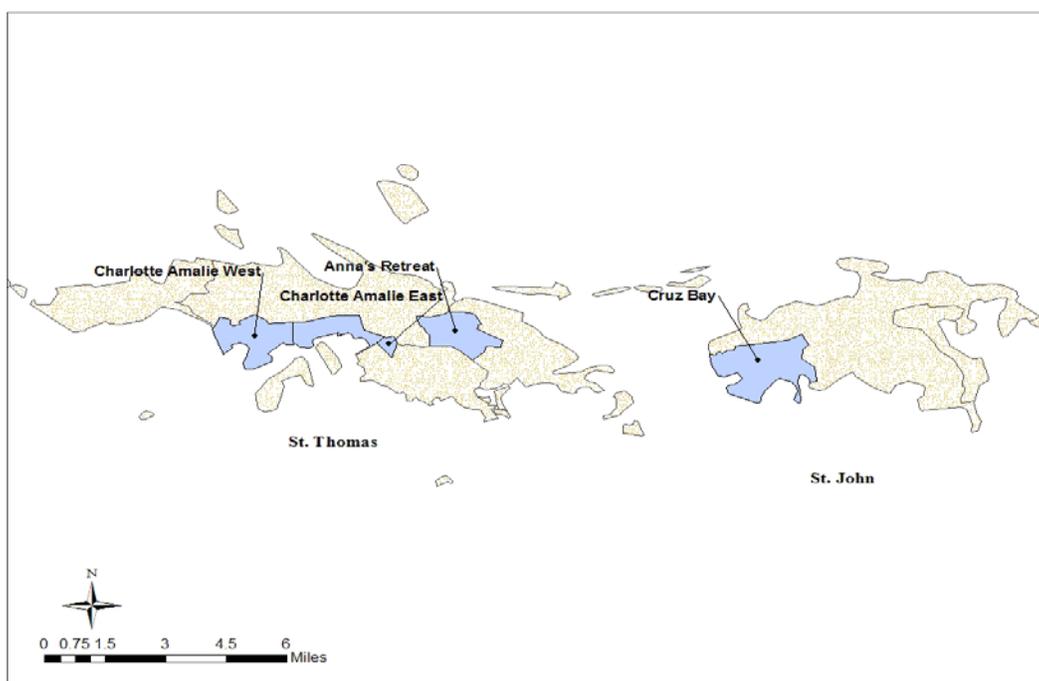


Figure 3.4.2.3. Map of St. Thomas and St. John with census designated places.
Source: NMFS SERO Fisheries Social Science Branch, M.Jepson.

Like St. Croix and Puerto Rico, commercial fishing on St. Thomas and St. John is much like that of the other islands in that is likely “artisanal.” Most fishermen construct and repair their gear and boats, as well as market their fish (Kojis and Quinn 2012). The recent census places the number of active fishermen at around 187 on both islands (Kojis and Quinn 2012).

The majority of commercial fishermen of St. Thomas and St. John classify themselves as French descent with the next largest ethnic group identified as West Indian. The most frequent racial designation is White. The time spent fishing is split almost evenly between full-time fishermen putting in over 36 hours a week, those putting in 15-36 hours a week, and those spending less than 15 hours a week (Kojis and Quinn 2012).

The dominant gear type used is hook and line with traps second. Dive gear fishing is third, but many fishermen, as in St. Croix indicated that they fish several gear types throughout the year (Kojis and Quinn 2012). Vessels are also small and hauled on trailers transported to different parts of the island according to the type of fishery prosecuted seasonally. However, both the Northside and Southside provide mooring and dockage as do other marinas and protected bays around the island where vessels are kept (IAI 2007).

According to IAI (2007) the primary trap fishing areas for lobster and finfish are located to the south and north of the islands. The primary handline area is to the south with a small area north

of St. Thomas, while net fishing is almost exclusively conducted on the Northside of St. Thomas (IAI 2007). The primary target of fishermen from St. Thomas/St. John was reef fish (84.6%). Coastal pelagics were second (50.5%) with spiny lobster third (29.7%, Table 3.4.2.4).

Table 3.4.2.4. Relative importance of categories of fish, mollusks, and crustaceans to St. Thomas/St. John interviewed licensed commercial fishers. Frequency includes the number of fishermen who answered that they harvest a particular category. Percentages can equal more than 100% because fishermen harvested more than one category. Source: Kojis and Quinn 2012.

Categories of Fish	Frequency	Percent
Reef fish	77	84.6%
Coastal pelagic	46	50.5%
Deep pelagic	9	9.9%
Deep-water snapper	7	7.7%
Bait fish	3	3.3%
Queen conch	8	8.8%
Whelk/West Indian top shell	9	9.9%
Spiny lobster	27	29.7%
Total # of fishers	91	204.4%

Recreational fishing is likely more important in St. Thomas than other islands in the USVI. The East End of the island has a concentration of charter fishing vessels and infrastructure. In contrast to commercial fishermen, recreational fishermen are more likely to target coastal pelagic fish which explains the highly disperse fishing area for charter fishermen which extends well beyond the north sides of both islands and far south of St. Thomas (IAI 2007). Again, there seems to be little if any description of subsistence fishing in either St. Thomas or St. John, although subsistence fishing does exist and is likely an important source of food for many, we do not have sufficient information to provide a complete description.

In terms of fishing communities on the island, it seems that the geographical dispersion of fishermen throughout the island and the same dispersion of their fishing activities has led some to suggest that the entire island should be designated a fishing community (Stoffle et al. 2011). Some parts of St. Thomas have been identified as having substantial fishing activity and it has been suggested that they could be considered a place-based fishing community (IAI 2007). Nevertheless, fishing has been identified as an important component of the culture and livelihood of many individuals on the islands, whether commercial, recreational or subsistence.

3.4.3. Environmental Justice Considerations

Executive Order 12898 requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories. This executive order is generally referred to as environmental justice (EJ).

Minority populations: The Hispanic origin group which is considered a minority in the continental United States is the majority ethnic group in Puerto Rico. In the year 2010, 16.3% of the population of the continental United States was comprised of residents that identified as Hispanic or Latino; however for the same year, 99% of the population of Puerto Rico identified as Hispanic or Latino (U.S. Census Bureau, 2010 Census). In the USVI the majority of the population is Black or African American (72% including those of two or more races) according to the year 2000 Census; whereas the percentage of the population comprised of Black or African American residents of the continental United States was 12.9% for the same year. The minority (minority is commonly interpreted for the United States as White, non-Hispanic) rates for all of Puerto Rico and the USVI are substantially higher than that of the continental United States.

Low-income populations: Low-income populations in the U.S. Caribbean make up a much greater percentage of the general population than in the continental United States. The percentage of people below poverty included 45.2% of the population in Puerto Rico for the year 2010, significantly higher than that of the continental United States which included 15.3% of the population below poverty (U.S. Census Bureau, 2010 Census). For the year 2010 the poverty rate for the USVI was 22.2%, also significantly higher than the rate for the continental United States (U.S. Census Bureau, 2010 Census). These overall higher poverty rates indicate that the U.S. Caribbean includes more individuals that are likely to be more vulnerable and experience higher levels of effects when changes in fisheries management are conducted.

Because this proposed action is expected to impact fishermen in the U.S. Caribbean and information is not available in most cases to link these fishermen to the communities in which they reside, all communities in Puerto Rico and the USVI have been examined using census data to see if they have poverty rates that exceed EJ thresholds.

The threshold for comparison that was used was 1.2 times the average of the USVI or Puerto Rico such that, if the value for the community was greater than or equal to 1.2 times the average of the greater area, then the community was considered an area of potential EJ concern (EPA 1999).

As mentioned above, the poverty rate for Puerto Rico for the year 2010 was 45.2%. This value translates into an EJ poverty threshold of approximately 54.2%. The communities below

exceeded this poverty threshold and are the most likely to be vulnerable to EJ concerns (Table 3.4.3.1).

Table 3.4.3.1. Puerto Rico communities which exceeded poverty threshold for year 2010.
Source: U.S. Census Bureau 2010.

Community	Percent of Population Below Poverty Level
Adjuntas	57.2
Aguada	56.5
Barranquitas	54.7
Ciales	59.3
Coamo	55.8
Comerío	58.4
Corozal	58.4
Guánica	58.2
Guayanilla	56.5
Isabela	57.1
Lajas	55.7
Lares	58.1
Las Marías	58.2
Maricao	65.7
Maunabo	55.6
Moca	57
Morovis	62
Naranjito	55.3
Orocovis	62.6
Patillas	57
Peñuelas	57.7
Quebradillas	60.6
Salinas	58.5
San Sebastián	58.5
Utado	57.6
Villalba	57.1
Yauco	56.8

As mentioned above, the poverty rate for the USVI in 2010 was 22.2%. This value translates into an EJ poverty threshold of approximately 26.6%. The communities below exceeded this poverty threshold and are likely the most vulnerable to EJ concerns (Table 3.4.3.2).

Table 3.4.3.2. U.S. Virgin Islands communities which exceeded poverty threshold for year 2010. Source: U.S. Census Bureau 2010.

Community	Poverty Rate
Charlotte Amalie	27.3
Charlotte Amalie East	30.7
Christiansted	41.1
Frederiksted	45.9
Frederiksted Southeast	38.9

The greater commonwealth of Puerto Rico and territory of the U.S. Virgin Islands and the majority of the communities expected to be affected by this proposed amendment have minority or economic profiles that include higher rates than that of the continental United States. EJ issues could arise in FMUs or species which could experience decreases in their ACLs as a result of this proposed amendment, particularly in regard to poverty. Food insecurity is a large issue in the U.S. Caribbean and these vulnerable low-income populations could be impacted to a greater extent because of their dependence on the fish they receive through fishing efforts and utilize as food to supplement their income.

The general participatory process used in the development of fishery management measures (e.g., public hearings, and open Caribbean Council meetings) is expected to provide opportunity for meaningful involvement by potentially affected individuals to participate in the development process of this amendment and have their concerns factored into the decision process. In addition, the proposed actions section of this amendment will be translated into Spanish to provide local populations with access to the information and the ability to participate in the development of this amendment.

3.5 Administrative Environment

3.5.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Act (16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the U.S. EEZ, an area extending from the seaward boundary of each coastal state to 200 nautical miles from shore, as well as authority over U.S. anadromous species and continental shelf resources that occur beyond the U.S. Caribbean EEZ.

Responsibility for federal fishery management decision-making is divided between the Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states/territories. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for promulgating regulations to implement plans and amendments after ensuring management measures are consistent with the Magnuson-Stevens Act and with other applicable laws. In most cases, the Secretary has delegated this authority to NMFS.

The Council consists of seven voting members: four public members appointed by the Secretary, one each from the fishery agencies of Puerto Rico and the USVI, and one from NMFS. The Council is responsible for fishery resources in federal waters of the U.S. Caribbean. These waters extend to 200 nautical miles offshore from the nine-mile seaward boundary of the Commonwealth of Puerto Rico and the three-mile seaward boundary of the Territory of the USVI.

The total area of fishable habitat in the U.S. Caribbean is estimated to be approximately 2,467 square nautical miles (nm^2) (8,462 km^2). Fishable habitat is defined as those waters less than or equal to 100 fathoms (600 ft; 183 m). The fishable habitat within the EEZ is 355 nm^2 (1,218 km^2) or 14.39% of the U.S. Caribbean total, with 116 nm^2 (398 km^2) (4.7%) occurring off Puerto Rico and 240 nm^2 (823 km^2) (9.7%), occurring off the USVI. The vast majority of the fishable habitat in federal waters off Puerto Rico is located off the west coast.

The vast majority of the fishable habitat in federal waters off the USVI is located off the north coast of St. Thomas. The majority of fishing activity for Council-managed species occurs in that area, except for fishing for deep-water snappers, which occurs primarily in the EEZ at depths greater than 100 fathoms (600 ft; 183 m) (CFMC 2005).

Public interests are also involved in the fishery management process through participation on advisory panels and through Council meetings that, with few exceptions for discussing personnel matters, are open to the public. In addition, the regulatory process is in accordance with the Administrative Procedures Act, in the form of “notice and comment” rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

Regulations that implement the management measures in the FMPs are enforced through actions of NOAA’s Office of Law Enforcement, the U.S. Coast Guard, and various Puerto Rico commonwealth and USVI territory authorities. To better coordinate enforcement activities, federal and commonwealth and territory enforcement agencies have developed cooperative agreements to enforce the Magnuson-Stevens Act. However, enforcement in the Caribbean region is severely underfunded. Because personnel and equipment are limited, compliance with federal regulations depends largely on voluntary compliance (Heinz Center 2000).

The Fishery Conservation Amendments of 1990 (P.L. 101-627) conferred management authority for Atlantic highly migratory species (HMS), including tunas, oceanic sharks, marlins, sailfishes, and swordfish, to the Secretary from the Fishery Management Councils. In 2012, Amendment 4 to the Consolidated Atlantic Highly Migratory Species Fishery Management Plan: Caribbean Fishery Management Measures re-evaluated the management measures for commercial and recreational HMS fisheries operating in the U.S. Caribbean. The rule implementing this amendment became effective on January 2, 2013. This rule had the purpose of improving permitting of and data collection from vessels operating in the U.S. Caribbean to better manage the traditional small-scale commercial HMS fishing fleet in the U.S. Caribbean Region, enhance fishing opportunities, and improve profits for the fleet, and to provide improved capability to monitor and sustainably manage those fisheries. For additional information regarding the HMS management process and authority in the Caribbean, please refer to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (HMS FMP, <http://www.nmfs.noaa.gov/sfa/hms/>) and Amendment 4 to the HMS FMP (<http://www.nmfs.noaa.gov/sfa/hms/FMP/AM4.htm>).

Recreational fishing in the EEZ requires fishermen register in the National Registry. For information, please visit the Marine Recreational Information Program Web site at <http://www.countmyfish.noaa.gov/>.

3.5.2 Territory and Commonwealth Fishery Management

The governments of the Territory of the USVI and the Commonwealth of Puerto Rico have the authority to manage their respective state fisheries. The USVI is an unincorporated territory with a semi-autonomous government and its own constitution. As a commonwealth, Puerto Rico has

an autonomous government, but is voluntarily associated with the U.S. (OTA 1987). The USVI has jurisdiction over fisheries in waters extending up to three nautical miles from shore, with the exception of about 5,650 acres of submerged lands off St. John which are owned and managed by the National Park Service (Goenaga and Boulon 1991). The USVI Department of Planning and Natural Resources (DPNR) is the USVI's fishery management agency. The DPNR regulates commercial and recreational fishing activities with the advice of the Division of Fish and Wildlife and the St. Thomas/St. John and St. Croix Fisheries Advisory Committees (Uwate 2002 in DPNR 2005). The DPNR/Division of Environmental Enforcement is responsible for enforcing regulations within USVI waters (Uwate 2002 in DPNR 2005). Puerto Rico has jurisdiction over fisheries in waters extending up to nine nautical miles from shore. Those fisheries are managed by Puerto Rico's Department of Natural and Environmental Resources. Section 19 of Article VI of the Constitution of the Commonwealth of Puerto Rico provides the foundation for the fishery rules and regulations. Puerto Rico Law 278 of 1998 establishes public policy regarding fisheries.

Each state fishery management agency has a designated seat on the Council. The purpose of local government representation at the council level is to ensure local participation in federal fishery management decision-making. The state governments have the authority to manage their respective state fisheries. Each of the states exercises legislative and regulatory authority over their natural resources through discrete administrative units. Although each agency is the primary administrative body with respect to the states' natural resources, both Puerto Rico and the USVI cooperate with numerous state and federal regulatory agencies when managing marine resources.

Both Puerto Rico and the USVI require commercial fishing licenses, permits for some species, and reporting. Puerto Rico requires a license for commercial fishers, and has categories for full-time, part-time, novice, and non-resident commercial fishers, ornamental fisheries, and owners of rental boats, including charter and party/head boats. Additional commercial permits are required for the harvest of spiny lobster, queen conch, common land crab, incidental catch, and sirajo goby (i.e., cetí) fisheries. Although Puerto Rico fishing regulations state that a license for all recreational fishermen 13 years and older (excluding fishermen on charter or head boats) is required, this requirement is not currently in place.

The USVI only has a license requirement for commercial fishers who are permanent USVI residents, with the exception of a recreational shrimp permit for Altona Lagoon and Great Pond on St. Croix, and for fishing activities in the Great St. James Marine Reserve off St. Thomas. Any person that trades any part of his catch, including charter boat operators who sell or trade their catch, must obtain a commercial license (DPNR 2012). In the USVI, a moratorium on new commercial fishing licenses has been in place since 2001.

USVI commercial fishermen are required to report their catch (all species) and effort for every trip (CFMC 2010). Catch report forms must be submitted to the Department of Planning and Natural Resources (DPNR) on a monthly basis, no later than 15 days after the end of the fishing month. The level of non-reporting, under-reporting, and delayed reporting is not well known. However, the DPNR has been working with the fishermen to improve accuracy of reports and the reporting rate.

In the USVI, permits are not required for recreational fishing. Recreational fishers are not allowed to sell their catch or to use certain fishing gears to catch fish (i.e., traps, pots, haul seines, and set-nets). Subsistence fishermen that do not use pots, traps, haul seines, and set-nets (commercial gear) are not required to have a license (DPNR 2012). However, fishing permits are required to fish in some areas in the USVI (DPNR 2012; Section 3.4.2 of this document).

Additional information regarding fishery management in state or federal waters can be found in Section 2.1 of the 2005 Caribbean SFA Amendment (CFMC 2005), and in the 2010 Caribbean ACL Amendment (CFMC 2011a). Additional information about commercial and recreational fisheries in the USVI can be found in Section 3.3.

Chapter 4. Environmental Effects

Chapter 4 describes the effects to the physical, biological and ecological, economic, social, and administrative environments from the alternatives in the proposed action. In the following sections the terms fishery management unit (FMU) and stock are used interchangeably.

4.1 Management Measures for the Proposed Action: Annual Catch Limit Control Rule

Action: Establish a control rule to adjust the buffer reduction applied to the overfishing limit (OFL) or to the acceptable biological catch (ABC) used to derive the annual catch limit (ACL), to reflect a change in overfishing status of the stock.

Summary of Management Alternatives

Alt. 1: No Action

Alt. 2: ACL Control Rule for all managed species where $ACL = [OFL \text{ (or ABC)} \times (0.85)]$ for FMUs determined to be 'subject to overfishing', and where $ACL = [OFL \text{ (or ABC)} \times (0.90)]$ for FMUs determined to be 'not subject to overfishing'.

Preferred Alt. 3: ACL Control Rule as **Alternative 2**, but allows for exceptions:

Preferred Sub-alt.: 3a. Parrotfish FMU – As defined in the 2010 Caribbean ACL Amendment, $ACL = [ABC \times (0.85)]$. An additional 5.8822 percent reduction to St. Croix's parrotfish FMU ACL

Preferred Sub-alt. 3b. Surgeonfish FMU – As defined in the 2011 Caribbean ACL Amendment, $ACL = [ABC \times (0.75)]$

Preferred Sub-alt. 3c. Angelfish FMU – As defined in the 2011 Caribbean ACL Amendment, $ACL = [ABC \times (0.75)]$

Preferred Sub-alt. 3d. Queen conch FMU – As defined in the 2010 Caribbean ACL Amendment, for St. Croix, $ACL = ABC$ specified by the Council's SSC. For Puerto Rico and St. Thomas/St. John, $ACL = 0$.

Preferred Sub-alt. 3e. Aquarium Trade Species FMU – As defined in the 2011 Caribbean ACL Amendment, $ACL = [ABC \times (0.75)]$

4.1.1 Direct and Indirect Effects on the Physical Environment

Management actions that affect the physical environment mostly relate to the interactions of fishing gear with the sea floor. The degree or magnitude of the effects will depend on if an action increases or decreases fishing gear interactions with the bottom habitat. It also depends on the vulnerability of a particular habitat to disturbance and the rate at which the habitat can

recover from such disturbances (Barnette 2001). The primary gear types used in the reef fish, queen conch, spiny lobster, and coral fisheries are described in Section 3.3. These include vertical line gear, traps, spear fishing, and hand harvest. Vertical line gear has the potential to snag and entangle bottom structures, which can result in breakage and abrasions (Barnette 2001). Traps can break and damage vulnerable corals, including Endangered Species Act (ESA) listed species, which offer significant benthic structure and essential fish habitat (EFH) in the U.S. Caribbean (Barnette 2001). Hand harvest while free diving or SCUBA diving, commonly used in the queen conch fishery and, to some extent in the spiny lobster fishery, is expected to have little to no adverse direct effects on the physical environment in general, including *Acropora* species and their designated critical habitat. However, indirect effects from anchoring may occur. Because this proposed action is administrative in nature, this action would not change the primary gears or how they are used currently in these fisheries. While future implementation of this rule could potentially change how these gears are used, no direct effects on the physical environment are expected over the short- or long- term from the implementation of this specific action, beyond those resulting from an increase or a decrease in the ACL. The cumulative effects of repeated anchoring by fishermen using any harvest method, including spear guns and hand harvest, as well as the use of fishing traps, also can damage (e.g., reduce vertical relief) hard bottom areas where fishing occurs (Barnette 2001 in CFMC 2011a). The cumulative effects of anchoring and trap fishing will depend on how much the proposed action causes an increase or decrease in the quantity and time spent in fishing activities.

The action in this comprehensive amendment proposes to adjust the buffer reductions applied to the OFL or to the ABC to derive the ACL for managed species for which harvest is allowed. Although this action would affect all fisheries conducted in the U.S. Caribbean exclusive economic zone (EEZ), it is not expected to substantially modify fishing activities. Modifying how management reference points are specified, such as the relationship between the OFL, ABC, and the ACL, is not expected to cause direct physical effects. Modifying the ACL of a particular unit as a result of the action proposed may have indirect effects on the physical environment that would depend upon the degree to which a change in the ACL limits or liberalizes the catch of such unit in any given year. For example, larger ACLs are likely to support less restrictive management controls and increased habitat interactions relative to smaller ACLs. Indirect effects on the physical environment would also be expected if the action modifies the amount of time that fishing activities (in the form of fishing gear interactions with the sea floor or anchoring) are conducted in a particular habitat. Indirect effects of the action on the physical environment would depend on how much each of the possible alternatives contributes to an increase or decrease in habitat interactions.

Alternative 1 (no action) would not establish a control rule, and thus would retain the current buffer reductions to the OFL or ABC used to determine the ACL for managed units as

established in the 2010 and 2011 Caribbean ACL Amendments (CFMC 2011a, b). Because the current ACL values would remain the same, physical indirect effects, would remain the same.

However, with **Alternative 1** there is the possibility that, if in a particular year, the status of an FMU changes to ‘subject to overfishing’ from ‘not subject to overfishing’ or ‘unknown’; there would be no expeditious mechanism with which to adjust the ACL to reflect the current status of the fishery. If the unit’s current ACL is not restrictive enough, it could lead to continued overfishing. Overfishing can cause indirect effects to the physical environment in the long term by negatively affecting, for example, the reef’s ecological balance and biodiversity (ecological interactions). Under **Alternative 1**, if an FMU is no longer subject to overfishing but its current ACL is too restrictive, catches could be constrained more than needed. However, this could benefit the physical environment relative to the other alternatives that would allow for increasing harvest by reducing physical interactions with the habitat as fishing effort is reduced.

Alternative 2 would establish an ACL control rule that would modify the buffer applied to the OFL or the ABC to derive the ACL for all managed species for which harvest is allowed. Under **Alternative 2**, if in a particular year, based on the most recent landings, an FMU is determined to be ‘subject to overfishing’ from a previous ‘not subject to overfishing’ status or ‘unknown’ status, a buffer reduction of 15% would be applied to the OFL or the ABC to derive a new ACL for the following year. This reduction in the allowed harvest (from 10% to 15% buffer reduction) for a particular FMU (i.e. a smaller ACL) would likely have the greatest benefit to the physical environment because of the expected reduction in fishing effort. Fewer vessels results in fewer interactions between habitat and fishing gear (i.e., anchors). However, the extent of the beneficial indirect effects would depend on the changes to the ACL relative to the current ACL. This change for most species would be 5%, and for some others will vary between 10-15%. In addition, the amount that these interactions are minimized would also depend on how much fishermen compensate for the fishing opportunities lost in a particular fishery and increase fishing for other species.

However, the degree of the effects would depend on 1) how often the overfishing status of a stock changes through time and thus triggers the application of the control rule that would result in changes to the ACL and 2) potential changes in the overfishing status based on historical landings.

Section 2.2.1.1 analyzes potential changes to the current ACLs under the different alternatives proposed. For example, if in a particular year the status of a 2011 stock (except for surgeonfish, angelfish, or aquarium trade species) changed to ‘subject to overfishing’ from ‘not subject to overfishing’ or ‘unknown’, the ACL for that unit would be reduced by 5%. Although the relationship is not direct because fishers may take the same number of trips and simply harvest

fewer fish on each trip, it is reasonable to project a reduction in direct physical impacts to the environment of no more than 5%.

Conversely, under **Alternative 2**, if in a particular year an FMU is determined to ‘not be subject to overfishing’ or to be of ‘unknown’ status from a previous ‘subject to overfishing’ status, then a 10% buffer would be applied to the OFL or ABC to derive the new ACL. Section 2.2.1.1, analyzed how much the ACL would change under a ‘not subject to overfishing’ status in **Alternative 2**. For 2010 stocks, for example, which were previously determined to be ‘subject to overfishing’, a change in status would increase the ACL for any unit, except for queen conch, by approximately 5%. Increasing harvest opportunities could increase the potential for habitat interactions if that change is more than the current average annual landings for that particular fishery. A larger ACL could also make the species more vulnerable to overfishing, which could in the long term negatively impact the stock indirectly by affecting, for example, the reef’s ecological balance (e.g., cascade effects, predator-prey interactions) and biodiversity (ecological interactions).

Sub-section C of Section 2.2.1.1 compared the resulting ACLs from **Alternative 2** to the average of recent landings for 2010 and 2011 stocks. For example, the average of landings for the years 2010-2011 for snapper unit 2 for the Puerto Rico commercial sector and for grouper in St. Thomas/St. John exceeded not only the current ACL for the unit if no action was taken but also the new ACL that would be derived under a ‘not subject to overfishing’ status in **Alternative 2**. That overage from the current ACL translated into triggering of AMs in 2013 for those two units. Under a ‘not subject to overfishing’ scenario, those two units would have also exceeded the new ACL (although by a lesser amount) and thus AMs would also need to be triggered. Shortening the season could provide benefits to the physical environment by reducing fishing effort and thus habitat interactions with the bottom. The same would apply for those 2011 stocks that exceeded their ACL under **Alternative 1**, and thus the new ACL that would be derived under a ‘not subject to overfishing’ status (Table 2.2.1.1.16).

Alternative 2 would apply the control rule to all managed species for which harvest is allowed. As discussed in Section 2.2.1, **Alternative 2** would not support the special management measures that currently apply to the parrotfish, angelfish, surgeonfish, queen conch, and aquarium trade species FMUs. For the angelfish and surgeonfish FMUs for each island and sector, and for aquarium trade species FMU at the Caribbean-wide level, **Alternative 2** would translate into an increase in the allowed harvest under both the ‘subject to overfishing’ and ‘not subject to overfishing’ or ‘unknown’ status scenarios. Parrotfish harvest would also be increased if the complex is ‘not subject to overfishing’ any longer, like in the present, and the allowed ACL is increased as a result. Increasing harvest opportunities for these units would increase the potential for interactions with the habitat supporting those fisheries, including coral reef habitat. In the case of angelfish and surgeonfish, which are mostly captured with traps, this means that

the habitat/gear interaction could be even more evident. For queen conch, applying a buffer to the ABC would certainly reduce the current harvest allowed under any of the ‘subject to overfishing’ and ‘not subject to overfishing’, or ‘unknown’ status scenarios. For the queen conch, **Alternative 2** is not expected to contribute any additional positive indirect effects on the physical environment because of minimal effects expected from hand harvest methods used to fish for queen conch. Nevertheless, a decrease in harvest opportunities for the queen conch may potentially decrease anchoring interactions, thus benefiting the physical environment relative to the status quo.

Preferred Alternative 3 would establish an ACL control rule that would affect managed species for which harvest is allowed, but provides for the specific FMUs mentioned above to be exempted from the rule based on the choice of sub-alternatives chosen by the Caribbean Fishery Management Council (Council). Although most of the effects on the physical environment that would be expected under **Preferred Alternative 3** are the same that would be expected under **Alternative 2**, there would be differences depending on the individual sub-alternatives that could be selected by the Council. The Council may choose one or more sub-alternatives. For those sub-alternatives of **Preferred Alternative 3** chosen by the Council, the relationship between the OFL or ABC and the ACL would remain as status quo.

Preferred Sub-alternative 3a provides for the parrotfish complex to be exempt from application of the control rule. Parrotfish would continue to have the same ACLs defined in the 2010 Caribbean ACL Amendment. As discussed in Section 2.2.1, these were derived from buffer reductions to the ABCs recommended by the SSC for each island/island group, and further divided by commercial and recreational sectors for Puerto Rico. The parrotfish ACL in the St. Croix management area, where a directed fishery for parrotfish occurs, was further reduced to address uncertain effects of that harvest on essential settlement substrate for Acroporid corals. Further reducing the ACL for legally caught parrotfish had the purpose of further increasing the grazing pressure exerted by these species, thereby potentially increasing availability of critical habitat (hard substrate devoid of fleshy macroalgae) for Acroporid coral recruits. By taking this action, the Council addressed the important contributions of parrotfish to the health and vibrancy of Caribbean coral reefs. Under this sub-alternative, given that the current ACL values for parrotfish would remain valid, physical indirect effects as mentioned above would not be expected to differ from the status quo.

Preferred Sub-alternative 3b and **Preferred Sub-alternative 3c** provide for the surgeonfish FMU and the angelfish FMU, respectively, to be exempted from the control rule. The ACLs for surgeonfish and angelfish for Puerto Rico (commercial and recreational), St. Croix, and St. Thomas/St. John established in the 2011 Caribbean ACL Amendment would continue to be valid under each of these sub-alternatives. Thus, physical indirect effects are not expected to be different than status quo. The buffer reductions applied to the ABC for these FMUs to derive the

ACLs considered the ecological role of these species as important herbivores (surgeonfish) and spongivores (angelfish) in coral reef communities. Surgeonfish, like parrotfish, contribute important algal grazing services and thus serve an important role in maintaining critical habitat for Acroporids. Angelfish serve as an important spongivore in coral reefs, and with herbivores, contribute to maintain the ecological integrity of many of our Caribbean coral reefs.

Preferred Sub-alternative 3d provides for the queen conch FMU to be exempted from the ACL Control Rule. Under this sub-alternative, the current ACLs established in the 2010 Caribbean ACL Amendment for queen conch in Puerto Rico, St. Thomas/St. John (ACL = 0), and St. Croix (ACL = 50,000 lbs) would continue to be valid; therefore, any indirect effects on the physical environment are not expected to be different than status quo.

Preferred Sub-alternative 3e would exempt the aquarium trade species FMU from the ACL Control Rule. This FMU contains species in both the Reef Fish FMP and the Coral FMP. The ACL for this FMU is Caribbean-wide and was established in the 2011 Caribbean ACL Amendment. Under this sub-alternative, the current Caribbean-wide ACL would continue to be valid; therefore, any indirect effects on the physical environment would not be expected to be different than status quo.

4.1.2 Direct and Indirect Effects on the Biological and Ecological Environment

Although this action would affect all fisheries conducted in the U.S. Caribbean EEZ, it is not expected to substantially modify fishing activities. The action proposed in this amendment would simplify the process of adjusting the ACLs, if needed, in the future, rather than doing it on a case by case basis or through a lengthier full plan amendment. The action may have beneficial impacts such as more responsive management sensitive to the status of the targeted population and increased revenue from healthy fisheries. However, the latter may be adverse as well, if a change in status results in a reduction in allowable harvest.

Modifying how management reference points are specified, such as the relationship between the OFL, ABC, and the ACL, is not expected to cause direct biological or ecological effects. Adjusting the ACL as a result of the action proposed may have indirect effects on the biological and ecological environment and the magnitude of those effects would depend on how much the new ACL limits the catch of an FMU in any given year. For example, although a reduced buffer could benefit fishers by allowing for a slightly larger ACL, a larger ACL could also make the species more vulnerable to overfishing relative to a smaller ACL, which could negatively impact the stock and ultimately, negatively impact fishermen in the long run.

Alternative 1 is the no action alternative and would not establish a control rule, thus would retain the current buffer reductions to the OFL or ABC used to determine the ACL for Council managed species as established in the 2010 and 2011 Caribbean ACL Amendments (CFMC 2011a, b). The buffers chosen were the ones the Council considered would provide the best balance between maximizing harvest while preventing overfishing. If no action is taken and an FMU is no longer subject to overfishing, but the current ACL is too restrictive, catches could be constrained more than needed. This restriction could result in lost yield and failure to achieve the optimum yield, which may have economic repercussions for fishermen, as well as other biological and social impacts. In the long term, a more restrictive ACL would reduce the likelihood of the OFL being exceeded and overfishing occurring, thus benefiting the biological environment relative to a higher ACL. Depending on harvest patterns, when compared to a less restrictive ACL, a more restrictive or conservative ACL may increase the possibility of triggering AM closures, further reducing fishing effort by shortening the season and benefiting the biological and ecological environment. Section 2.2.1.1 C compares recent landings to the ACL to analyze the impact of taking no action in **Alternative 1**. This analysis shows that some 2010 and 2011 stocks exceeded their corresponding ACL triggering AMs in 2013. It also shows that if landing patterns continue, the same units would also exceed the status quo ACL in future years and AMs would need to be applied for those units.

On the contrary, if an FMU is now subject to overfishing but the current ACL is less restrictive, this could lead to continued overfishing and/or the unit to become overfished, negatively affecting the biological and ecological environment relative to a lower ACL. If a stock is subject to overfishing for a longer period it would be more difficult for the stock to recover from such a situation. In the case of overfished stocks, such as GU4, this could reduce the effectiveness of the rebuilding plan. **Alternative 1** would result in the least biological benefit because it would not allow for responsive management sensitive to the status of the fisheries. With respect to protected resources, **Alternative 1** is anticipated to perpetuate the existing level of risk of interactions between these species and the fishery.

Alternative 2 would establish a control rule to modify the buffer reduction that is applied to the OFL or to the ABC to derive an ACL in response to changes in the overfishing status of all managed species for which harvest is allowed. Under **Alternative 2**, if in a particular year, based on the most recent landings, an FMU is determined to be ‘subject to overfishing’ from a previous ‘not subject to overfishing’ or ‘unknown’ status, a buffer reduction of 15% would be applied to the OFL or the ABC to derive a new ACL for the following year. This reduction in the allowed harvest for a particular FMU (from 10% to 15%) would be expected to indirectly benefit the biological and ecological environment relative to the status quo by reducing fishing effort and thus reducing fishing mortality for the targeted species. In the long term, a more restrictive ACL would aid in ending and preventing overfishing. In the short term, depending on harvest patterns, a more restrictive or conservative ACL may increase the possibility of

triggering AM closures (see Section 2.2.1.1 C), when compared to a less restrictive ACL, further reducing fishing effort by shortening the season. However, the magnitude of indirect benefits would depend on how much the ACL changes relative to the current ACL. Based on the analysis provided in Section 2.2.1.1, if for example, any of the 2011 stocks is determined to be ‘subject to overfishing’ from a previous ‘not subject to overfishing’ or ‘unknown’ status, the new ACL would be 5% less of what is currently allowed for all units in each island and sector except for angelfish, surgeonfish, and aquarium trade species FMU. This means that, if current harvest patterns continue, those 2011 stocks that exceeded the current ACL in the past would also exceed the new ACL under the ‘subject to overfishing’ status, although by a greater amount, thus triggering AMs.

Conversely, if in a particular year an FMU is determined to ‘not be subject to overfishing’ or its status is ‘unknown’ from a previous ‘subject to overfishing status’, then a 10% buffer would be applied to the OFL or ABC to derive the new ACL. The larger ACL resulting from a reduced buffer (from 15% to 10%) could make the species more vulnerable to overfishing, which could negatively impact the stock relative to the status quo and ultimately, negatively impact fishermen in the long run. For 2010 stocks, which were previously determined to be ‘subject to overfishing’, a change in status would increase the ACL for any unit, except for queen conch, by 5%.

Because **Alternative 2** would not allow for exceptions to the control rule, FMUs for which different buffers were used to derive the ACL based on ecological factors or special circumstances, such as queen conch, angelfish, surgeonfish, parrotfish, and aquarium trade species, could be either negatively or positively affected relative to the status quo if there is a change in their overfishing status in a particular year. As discussed earlier in Section 4.1.1 “Effects to the Physical Environment”, **Alternative 2** would not support those special management measures that currently apply to these FMUs. These management measures were set for these species in the 2010 and 2011 Caribbean ACL Amendments. These buffer reductions or special measures were selected by the Council after having been evaluated against several other buffer alternatives (NMFS 2011a, b). The buffers chosen were the ones that the Council considered would provide the best balance between optimizing harvest while maintaining the ecological integrity of the coral reef community. For the angelfish, surgeonfish, and aquarium trade species FMUs, **Alternative 2** would translate into an increase in the allowed harvest under both ‘subject to overfishing’ and the ‘not subject to overfishing’ or ‘unknown’ scenarios. Parrotfish harvest would also be increased if the complex is no longer ‘subject to overfishing’ (as in the present case), and the allowed ACL is increased as a result. Increasing harvest opportunities for these units could increase the potential for overfishing or lead to an overfished condition, thus potentially adversely affecting the biological and ecological environment relative to the status quo.

For queen conch, applying a buffer to the ABC would certainly reduce the current harvest allowed under any of the scenarios. A potential decrease in harvest opportunities for the queen conch may benefit the biological and ecological environment relative to the status quo by reducing fishing mortality for the species. However, this would be incompatible with the present regulatory environment in federal waters that limits queen conch fishing and possession to a 50,000-pound ACL in Lang Bank east of St. Croix, USVI. The ACLs for Puerto Rico and St. Thomas/St. John would not be affected because harvest is prohibited in those areas, and the ACL is zero. During the development of the 2010 Caribbean ACL Amendment, reductions to the queen conch OFL were analyzed and rejected. The SSC specified an ABC for queen conch of 50,000 pounds consistent with St. Croix's 50,000-pound landings limit in territorial waters, in part as an effort to have compatible regulations to aid enforcement.

It is unclear if **Alternative 2** will generate fewer or more biological and ecological benefits to protected resources than **Alternative 1**. If increased ACLs results in more total fishing effort, then the threat of interactions between U.S. Caribbean fisheries and sea turtles may increase, potentially leading to adverse biological and ecological effects relative to the status quo. Conversely, if lower ACLs reduce total fishing effort then the potential threat of interactions between fisheries and sea turtles may decrease; a biological and ecological benefit relative to the status quo. If changes in ACLs simply shifts effort from one target species to another or from one fishery to another, but does not change the total effort, then **Alternative 2** may have very little impact to sea turtles relative to **Alternative 1**. With respect to *Acropora* and *Acropora* critical habitat, the **Alternative 2** outcomes would be similar. If the ACLs for the parrotfish, surgeonfish, and angelfish FMUs are increased, this would likely lead to greater overall harvest of these species, potentially causing reduced grazing pressure. Reduced grazing could potentially decrease the availability of suitable settlement habitat for *Acropora* resulting in adverse biological and ecological effects relative to the status quo. Conversely, decreased ACLs would likely lead to lower overall harvest, potentially resulting in an increase in grazing pressure. Increased grazing could increase the availability of suitable settlement habitat for *Acropora* resulting in beneficial biological and ecological effects relative to the status quo. If changes in ACLs simply shift effort from one target species to another or from one fishery to another, but do not change the total effort, then **Alternative 2** may have very little impact to *Acropora* and *Acropora* critical habitat relative to **Alternative 1**.

Biological and ecological effects expected from **Preferred Alternative 3** are similar to the effects discussed above for **Alternative 2**, except for the effects expected for parrotfish, surgeonfish, angelfish, queen conch, and aquarium trade species. **Preferred Sub-alternatives 3a-3e** provide for exemptions to the control rule, and biological and ecological effects would depend on the selection of individual sub-alternatives by the Council. The Council can choose any or all sub-alternatives. Under **Preferred Sub-alternatives 3a-3e**, the relationship between

the OFL or ABC and the ACL would remain as status quo. The expected effects are discussed below.

Preferred Sub-alternative 3a provides for the parrotfish complex to be exempt from the application of the control rule. Parrotfish would continue to have the same ACLs defined in the 2010 Caribbean ACL Amendment for Puerto Rico (commercial and recreational sectors), St. Thomas/St. John, and St. Croix. As discussed in Section 2.2.1, these ACLs were derived from buffer reductions to the ABCs recommended by the SSC for each island/island group, and further divided by commercial and recreational sectors for Puerto Rico. The parrotfish ACL in the St. Croix management area was further reduced to address uncertain effects of that harvest on essential settlement substrate for Acroporid corals. Further reducing the ACL for legally caught parrotfish had the purpose of further increasing the grazing pressure exerted by these species, thereby potentially increasing availability of critical habitat (hard substrate devoid of fleshy macroalgae) for Acroporid corals. By taking this action, the Council addressed the important contributions of parrotfish to the health and vibrancy of Caribbean coral reefs. Under **Sub-alternative 3a**, the current ACL values for parrotfish would remain valid, thus biological and ecological indirect effects as mentioned above would not be expected to be different than status quo.

Preferred Sub-alternative 3b and **Preferred Sub-alternative 3c** provide for the surgeonfish FMU and the angelfish FMU, respectively, to be exempt from the control rule. The ACLs for surgeonfish and angelfish for Puerto Rico (commercial and recreational), St. Croix, and for St. Thomas/St. John established in the 2011 Caribbean ACL Amendment would continue to be valid under each of these sub-alternatives, thus biological and ecological indirect effects are not expected to be different than status quo. The buffer reductions applied to the ABC for these FMUs to derive the ACLs considered the ecological role of these species as important herbivores (surgeonfish) and spongivores (angelfish) in coral reefs. Surgeonfish, like parrotfish, contribute important algal grazing services and thus serve an important role in maintaining critical habitat for Acroporids. Angelfish serve as an important spongivore in coral reefs, and with herbivores, contribute to maintain the ecological integrity of many of our Caribbean coral reefs.

With respect to protected species, the biological and ecological effects from **Preferred Sub-alternatives 3a-3c** are likely to be same as those described previously for **Alternative 1**. These alternatives are likely to have greater biological and ecological benefits to *Acropora* and *Acropora* critical habitat than **Alternative 2** because they would not increase the ACL for these species, ensuring overall grazing pressure does not decrease due to fishing pressure.

Preferred Sub-alternative 3d provides for the queen conch FMU to be exempt from the ACL Control Rule. Under this sub-alternative, the current ACLs established in the 2010 Caribbean ACL Amendment for queen conch in Puerto Rico and St. Thomas/St. John (ACL = 0), and in St.

Croix (ACL = 50,000 lbs) would continue to be valid; therefore, any indirect effects on the biological and ecological environment are not expected to be different than status quo. This ACL quota for the queen conch is considered to be the best compromise between optimizing yield and preventing overfishing of the specie while supporting the ongoing rebuilding plan. With respect to protected species, the biological and ecological affects from **Preferred Sub-alternative 3d** are likely to be same as those described previously for **Alternative 1**.

Preferred Sub-alternative 3e would exempt the aquarium trade species FMU from the ACL Control Rule. This FMU contains species in both the Reef Fish FMP and the Coral FMP. The ACL for this FMU is Caribbean-wide and was established in the 2011 Caribbean ACL Amendment. Under this sub-alternative, the current Caribbean-wide ACL would continue to be valid; therefore, any indirect effects on the biological and ecological environment would not be expected to be different than status quo. With respect to protected species, the biological and ecological affects from **Preferred Sub-alternative 3e** are likely to be same as those described previously for **Alternative 1**.

If the overfishing status of any of the units in **Preferred Sub-alternatives 3a-3e** changes in any particular year, there would not be an expeditious mechanism to respond to this change in status. However, most of the buffers currently applied to derive the ACLs for these units are either equal to or lower than the proposed 15% reduction to the OFL or ABC for units subject to overfishing. Therefore, any effects from a change in status are expected to be minimal. However, the Council may desire to investigate why the unit(s) exceeded the OFL and thus became subject to overfishing even with a lower buffer applied.

In summary, when compared to **Alternative 1**, both **Alternative 2** and **Preferred Alternative 3** would result in greater biological benefit because both would allow for more responsive management sensitive to the status of the fisheries. Although overall, the greatest biological benefit would be provided by those alternatives that allow for the lowest harvest. Implementing the control rule under either **Alternatives 2** or **Preferred Alternative 3** provides the Council with the flexibility to respond to changes in the status of the fisheries in a more rapid manner instead of having to go through the lengthier full plan amendment process. When compared to **Alternative 2**, **Preferred Alternative 3** would be more beneficial to the biological and ecological environment because, by exempting parrotfish, angelfish, surgeonfish, and/or aquarium trade species from the application of the control rule, it would support current management measures for those units at more conservative harvest levels. Although **Alternative 2** may be more beneficial for the queen conch because it would reduce fishing mortality, **Preferred Alternative 3** would keep the current ACL quota for the queen conch which is considered to be the best compromise between optimizing yield and preventing overfishing of the species while also supporting the ongoing rebuilding plan (Table 4.1.2).

Table 4.1.2. Summary of Physical, Biological, and Ecological Effects from **Alternative 1, **Alternative 2**, and **Preferred Alternative 3**.**

Alternative 1 – No action	Effect
Physical: No change in fishing gears Biological: No increase or decrease in fishing mortality Status quo, no changes to buffer applied to OFL, therefore no changes to current ACL	No changes to current fishing activities, same level of interactions with the physical environment (anchoring, interactions of fishing gear with bottom, etc.). Same levels of fishing mortality if landings patterns are stable. Continued negative effects associated with harvesting resources.
If status of an FMU changes and there is no expedite mechanism to adjust the ACL to reflect the current situation:	
1) if FMU is determined to be subject to overfishing and FMU has previous buffer that may not be restrictive enough.	a) May lead to continued overfishing. Overfishing may have indirect effects in the physical environment such as disrupting the ecological balance in coral reef. b) The level of indirect effects depends on the level of overfishing and how much the potential changes in Alt. 2 and 3 compare to no action. Changes are small (5%), minimum effects expected.
2) IF FMU is determined not to be subject to overfishing and FMU has previous buffer that is too conservative.	Catches could be constrained more than needed. This could benefit the physical environment relative to the other alternatives that would allow for increasing harvest by reducing physical interactions with the habitat as fishing effort is reduced.
Alternative 2	
5% increase for not undergoing overfishing	Increasing harvest opportunities by increasing the ACL will increase habitat interactions. However, the amount of the increase will only be 5% for those FMUs with status change and is not expected to be significant. A larger ACL could also make the species more vulnerable to overfishing, which could negatively impact the stock indirectly affecting the reef's ecological balance and biodiversity (trophic interactions).
5% decrease for undergoing overfishing	Is expected to reduce habitat interactions but benefit will depend on the amount that fishermen compensate for lost fishing opportunities by fishing for other species and also how much the ACL changes compared to the current ACL.
Applies to all managed species for which harvest is allowed	There are some FMUs with different buffers to derive the ACL which were based on other factors such as ecological value, etc. This will definitely increase the amount allowed to harvest for most of them, increasing interactions with the bottom from those fisheries, and fishing mortality. Disrupts relationship between optimizing yield and preventing overfishing of the species, and may not support ongoing rebuilding plans for queen conch for example.
Preferred Alternative 3	
Same percent changes as Alternative 2	Same effects as in Alternative 2 above, except for angelfish, surgeonfish, queen conch, parrotfish, and aquarium trade FMUs.
Allows for exceptions: parrotfish, queen conch, surgeonfish, angelfish, aquarium trade species FMUs	Parrotfish – ACLs remains as in 2010 Caribbean ACL Amendment. The important contributions of parrotfish to the health and vibrancy of Caribbean coral reefs would continue to be addressed. Current ACL values would remain valid, physical indirect effects would not be expected to be different than status quo (positive effects). Surgeonfish, angelfish – ACLs remains as in 2011 ACL Amendment. Protect functional ecological role in reef, as herbivores and spongivores, respectively. Because ACLs do not change, physical effects not expected to be different than status quo (positive). Queen conch, aquarium trade – ACLs remain the same, not different than status quo.

4.1.3 Direct and Indirect Effects on the Economic Environment

Alternative 1 (No Action) would not change the current buffer applied to derive the ACL for Council managed species, thus would retain current ACLs for all units. This would not result in additional economic effects as long as the overfishing status of the unit remains the same. As stated above under the biological section, under the **Alternative 1 (No Action)**, a situation could occur whereby an FMU is no longer subject to overfishing, but the current ACL is too low. If this happens, landings could be lower than they need to be and the optimum yield would not be met, resulting in short-term adverse economic effects in the form of lost profits. In the long term, lower landings could indirectly benefit fishermen by resulting in healthier stocks and more fish available for harvest. Long-term economic benefits would be expected to occur with higher landings and profits over time.

However, the opposite scenario could also occur, as described in the previous biological section. If an FMU is now subject to overfishing but the current ACL under **Alternative 1 (No Action)** is less restrictive, this could lead to continued overfishing and/or the unit to become overfished, negatively affecting the biological and ecological environment relative to a lower ACL. In the short-term, the larger landings and profits would benefit fishermen. However, in the long-term, landings and profits would be negatively affected due to potential lower population levels. Also, if a stock is subject to overfishing for a longer period it would be more difficult for the stock to recover from such a situation. **Alternative 1** would result in the least economic benefits, when compared to **Alternatives 2** and **3** because it would not allow for responsive management sensitive to the status of the fisheries.

Comparisons between recent landings and the ACLs under Alternative 1 (No Action) are shown in Table 2.2.1.1.11 (2010 stocks) and Table 2.2.1.1.12 (2011 stocks). The comparisons show that the SU2 complex in Puerto Rico, queen conch in St. Croix, and grouper in St. Thomas/St. John exceeded their ACLs when compared to the 2010-2011 average under **Alternative 1** (No Action). As stated above, AMs were applied for those units during 2013 in the form of early closures (except for queen conch because AMs do not apply for this species). Comparison using 2010-2012 data, only queen conch exceeded the ACL but no AM was applied. Due to AMs applied for these species in the form of early closures under **Alternative 1** (No Action), commercial fishermen experienced short-term adverse effects in the form of lost ex-vessel revenue. Puerto Rico SU2 fishermen had losses of approximately \$472,785 (132,063 pounds) and St. Thomas/St. John grouper fishermen experienced ex-vessel revenue losses of \$29,505 (4,984 pounds).

For 2011 stocks, Puerto Rico wrasses (recreational), St. Croix angelfish, spiny lobster, squirrelfish, triggerfish and filefish, and wrasses and St. Thomas/St. John angelfish, squirrelfish, and wrasses exceeded their ACLs compared to 2011 landings. No AMs were applied to USVI

angelfish, squirrelfish, and wrasses because the higher landings were attributed to enhanced reporting. But, AMs were implemented for the remainder. The recreational fishery for wrasses certainly experienced adverse economic effects but these are not quantifiable at this time due to a lack of information about the dollar value placed on the catch of recreational fish in the Caribbean. The St. Croix spiny lobster commercial fishery experienced ex-vessel revenue losses amounting to approximately \$17,816 (2,401 pounds). The St. Croix triggerfish and filefish commercial fishery experienced ex-vessel losses amounting to approximately \$6,540 (1,473 pounds).

Analysis using preliminary Puerto Rico 2012 data showed that the number of times an **Alternative 1** (No Action) ACL was exceeded is 19 (17%) of the potential 111 ACL comparisons. If these landings trends continue under **Alternative 1** (No Action), commercial and recreational fishermen would experience short-term adverse economic effects for those FMUs.

Alternative 2 and Preferred Alternative 3 under the ‘Subject to overfishing’ Status Scenario

Alternative 2 under a ‘subject to overfishing status’ scenario would not change most of the current ACLs of 2010 stocks except the ACL for St. Croix queen conch, which would experience a decrease in the ACL. For most of the 2011 stocks, a ‘subject to overfishing scenario’ would cause a reduction in ACLs. However, the ACLs for angelfish, surgeonfish, and aquarium trade species will increase even under a subject to overfishing scenario because their ACLs were set at 75% of the ABC in the 2011 Caribbean ACL amendment. Under the ‘subject to overfishing’ status scenario, the ACLs for these species will be set at 85% of the ABC. So, harvest will increase for those species. That is why there is a proposal to exempt them from the application of the rule by adding sub-alternatives in **Preferred Alternative 3**.

Any decrease in a stock’s ACL implies a reduction in availability. This could result in a reduction in annual landings and ex-vessel revenues for commercial fishermen and a reduction in fish caught for recreational and subsistence fishermen.

The resulting ACLs from the ACL Control Rule proposed under **Preferred Alternative 3** would be the same as in **Alternative 2** for all managed species except for those units in **Preferred Sub-alternatives 3a-3e** (i.e., parrotfish, surgeonfish, angelfish, queen conch, and aquarium trade species). The additional economic effects under **Preferred Alternative 3** are therefore the same as under **Alternative 2** (see above and tables below). The ACLs proposed under **Preferred Sub-alternatives 3a-3e** would be the same as under **Alternative 1 (No Action)** and therefore no additional economic effects are expected.

A *decrease* in any ACL could result in potentially short-term direct adverse economic effects for commercial, recreational, and subsistence fishermen if annual landings decrease. If landings

decrease in the short-run, this could result in beneficial long-term direct economic effects for commercial, recreational, and subsistence fishermen through higher long-run ex-vessel revenues (for commercial fishermen) and more fish (for recreational fishermen) due to healthier than otherwise stocks. An *increase* in any ACL could result in potentially short-term direct beneficial economic effects for commercial and recreational fishermen if landings increase. If landings increase, this could result in adverse long-term direct economic effects for fishermen due to lower than otherwise long-run ex-vessel revenues (for commercial fishermen) and less fish caught (for recreational fishermen) resulting from less healthy stocks.

There are no known studies of estimates of the economic value of recreationally caught fish in the Caribbean. There are also no data for the cost and earnings of headboat or charter vessels in the Caribbean. Therefore, the economic effects of the proposed action on recreational fishermen are simply directional because they cannot be quantified at this time.

Tables 2.2.1.1.7 through 2.2.1.1.10 in Section 2.2.1.1 B show the maximum changes in the ACLs by weight by for stocks subject to overfishing and not subject to overfishing scenarios. Estimates of the losses by value are shown where data are available in the tables below.

Table 4.1.3.1 shows estimates of maximum potential short-term changes in ex-vessel revenue for commercial fishermen and estimates of the direction of economic effects (negative or positive) for recreational and subsistence fishermen for the stocks addressed in the 2010 Caribbean ACL Amendment and the 2011 Caribbean ACL Amendment, respectively, under the ‘subject to overfishing’ status scenario.

Table 4.1.3.1. Maximum potential change in annual commercial ex-vessel revenue and the direction of economic effects for the recreational and subsistence sectors under **Alternative 2**, **Preferred Alternative 3**, and **Preferred Sub-alternatives 3a-3e** assuming the ‘subject to overfishing status scenario’. Change in ACL pounds are shown in parentheses next to commercial or recreational estimated value changes. Source: Estimates made based on changes in pounds in Table 2.2.1.1.7 and Table 2.2.1.1.8 under Section 2.2.1.1 B above, and implied ex-vessel revenues from Chapter 3 Table 3.4.1.1.5, Table 3.4.1.1.12, and Table 3.4.1.1.18 for 2010 and 2011 for Puerto Rico and 2010-2012 for St. Croix and St. Thomas/St. John.

Puerto Rico	Alternative 2 Economic Effects		Preferred Alternative 3 Economic Effects	
	Comm (change in ex-vessel revenues and lbs)	Rec (change in direction of effects)	Comm (change in ex- vessel revenues and lbs)	Rec (change in direction of effects)
Snapper Unit 1	No change		No change	
Snapper Unit 2	No change		No change	
Snapper Unit 3	No change		No change	
Snapper Unit 4	No change		No change	

Grouper	No change		No change	
Parrotfish	No change		Sub-alternative 3a	
			No change	
Queen Conch	No change		Sub-alternative 3d	
			No change	
Boxfish	-\$12,917 (-4,784)	(-) (-256)	-\$12,917 (-4,784)	(-) (-256)
Goatfish	-\$2,264 (-976)	(-) (-20)	-\$2,264 (-976)	(-) (-20)
Grunts	-\$19,061 (-10,473)	(-) (-279)	-\$19,061 (-10,473)	(-) (-279)
Wrasses	-\$8,874 (-3,008)	(-) (-281)	-\$8,874 (-3,008)	(-) (-281)
Jacks	-\$7,984 (-4,781)	(-) (-2,833)	-\$7,984 (-4,781)	(-) (-2,833)
Scups and Porgies	-\$2,569 (-1,374)	(-) (-143)	-\$2,569 (-1,374)	(-) (-143)
Squirrelfish	-\$1,463 (-926)	(-) (-216)	-\$1,463 (-926)	(-) (-216)
Triggerfish and Filefish	-\$5,231 (-3,249)	(-) (-1,219)	-\$5,231 (-3,249)	(-) (-1,219)
Angelfish	(+) (No revenue data) (1,197)	(+) (599)	Sub-alternative 3c	
			No change	
Surgeonfish	(+) (No revenue data) (957)	(+) (478)	Sub-alternative 3b	
			No change	
Spiny Lobster	(-) (-18,218)		(-) (18,218)	
St. Croix	Alternative 2 Economic Effects in Ex-Vessel Revenues		Preferred Alternative 3 Economic Effects in Ex-Vessel Revenues	
Snapper	No change		No change	
Grouper	No change		No change	
Parrotfish	No change		Sub-alternative 3a	
			No change	
Queen Conch	(-) (-7,500)		Sub-alternative 3d	
			No change	
Boxfish	-\$1,938 (-468)		-\$1,938 (-468)	
Goatfish	-\$1,141 (-209)		-\$1,141 (-209)	
Grunts	-\$10,860 (-2,049)		-\$10,860 (-2,049)	
Wrasses	No change		No change	
Jacks	\$3,913 (-860)		\$3,913 (-860)	
Scups and Porgies	-\$906 (-258)		-\$906 (-258)	
Squirrelfish	-\$28 (-7)		-\$28 (-7)	
Triggerfish and Filefish	-\$6,158 (-1,387)		-\$6,158 (-1,387)	
Angelfish	\$120 (40)		Sub-alternative 3c	
			No change	
Surgeonfish	\$20,026 (4,480)		Sub-alternative 3b	
			No change	
Spiny Lobster	\$44,231 (-5,961)		\$44,231 (-5,961)	
St. Thomas/St. John	Alternative 2 Economic Effects in Ex-Vessel Revenues		Preferred Alternative 3 Economic Effects in Ex-Vessel Revenues	
Snapper	No change		No change	
Grouper	No change		No change	

Parrotfish	No change	Sub-alternative 3a
		No change
Queen Conch	No change	Sub-alternative 3d
		No change
Boxfish	-\$6,428 (-1,549)	-\$6,428
Goatfish	(-) (No revenue data) (-18)	(-) (No revenue data)
Grunts	-\$10,784 (-2,090)	-\$10,784 (-2,090)
Wrasses	-\$177 (-32)	-\$177 (-32)
Jacks	-\$13,465 (-2,090)	-\$13,465 (-2,090)
Scups and Porgies	-\$4,860 (1,212)	-\$4,860 (1,212)
Squirrelfish	-\$935 (-236)	-\$935 (-236)
Triggerfish and Filefish	-\$18,447 (-4,136)	-\$18,447 (-4,136)
Angelfish	\$3,159 (1,053)	Sub-alternative 3c
		No change
Surgeonfish	\$17,238 (3,900)	Sub-alternative 3b
		No change
Spiny Lobster	-\$43,418 (-5,789)	-\$43,418 (-5,789)
Caribbean Wide	Alternative 2	Alternative 3
Tilefish	(-) (No revenue data) (-813)	(-) (No revenue data) (-813)
Aquarium Trade Species	(+) (No revenue data) (1,087)	Sub-alternative 3e
		No change

Note: A negative (-) or positive (+) sign representing adverse or beneficial effects, respectively, is used in two situations: 1) where recreational effects cannot be quantified due to lack of value data or 2) A situation where the ACL is combined for both commercial and recreational fishermen (Puerto Rico spiny lobster and St. Croix queen conch).

Note: A “(-) (No revenue data)” or “(+) (No revenue data)” indicates that there are no revenue values available for these species groups/complexes in the trip ticket data. Therefore, economic effects cannot be quantified. We can assume, however, that if the poundage change in ACL is positive, then the economic effects are beneficial and if the poundage change in ACL is negative, then the economic effects are adverse.

Note: The reader should again note that the changes in actual landings resulting from the change in ACLs under each status scenario (‘subject to overfishing’ and ‘not subject to overfishing’) are uncertain. Therefore, the changes in ex-vessel revenue to commercial fishermen and economic effects to recreational and subsistence fishermen noted above are also uncertain and can be thought of as maximum potential changes.

Using 2010-2012 data, Tables 2.2.1.1.13 and 2.2.1.1.14 show the 2010 and 2011 stock complexes that would have exceeded their ACLs under a ‘subject to overfishing’ scenario in **Alternative 2** (Puerto Rico SU2, queen conch in St. Croix, and grouper in St. Thomas for 2010 stocks, and Puerto Rico recreational wrasses, St. Croix angelfish, spiny lobster, triggerfish and filefish, and wrasses, and St. Thomas/St. John angelfish, squirrelfish, and wrasses). Again, queen conch is not subject to an AM and therefore, no changes in landings would be expected. Also, similar to **Alternative 1** (No Action), high landings of USVI angelfish, squirrelfish, and

wrasses were attributed to improved reporting. If these same landings trends continued that occurred in 2010-2012, recreational and commercial fishermen of the remaining complexes would experience adverse economic effects due to AMs implemented. Losses for Puerto Rico SU2 and St. Thomas/St. John grouper would be the same as under **Alternative 1** (No Action). Losses in the commercial spiny lobster and triggerfish and filefish complexes would be larger than under **Alternative 1** (No Action) and amount to approximately \$62,055 (8,363 pounds) for St. Croix spiny lobster and approximately \$12,703 using 2011 data and \$4,271 using 2011-2012 data (2,861 and 962 pounds, respectively) for St. Croix triggerfish and filefish.

Under **Preferred Alternative 3**, economic effects are the same as those under **Alternative 2** under both the ‘subject to overfishing’ and ‘not subject to overfishing’ scenarios as discussed above except for parrotfish (**Preferred Sub-alternative 3a**), surgeonfish (**Preferred Sub-alternative 3b**), angelfish (**Preferred Sub-alternative 3c**), queen conch (**Preferred Sub-alternative 3d**), and aquarium trade species (**Preferred Sub-alternative 3e**). For these, results are the same as those under **Alternative 1** (No Action).

Alternative 2 and Preferred Alternative 3 under the ‘Not Subject to Overfishing’ and ‘Unknown’ Status Scenario

Alternative 2 under a ‘not subject to overfishing’ status scenario would change ACLs for all 2010 stocks and a few 2011 stocks. As stated in the previous paragraph, any decrease in an ACL could potentially result in lower landings, which would result in short-term direct adverse economic effects but long-term beneficial economic effects. The reverse is also true. Any increase in an ACL could potentially result in higher landings, which would result in short-term direct beneficial economic effects but long-term adverse economic effects.

Preferred Alternative 3 economic effects would be the same as **Alternative 2** economic effects because the resulting ACLs would be the same. The economic effects for **Preferred Sub-alternatives 3a-3e** would be the same as the economic effects under **Alternative 1 (No Action)** since those ACLs would remain as they currently are.

Table 4.1.3.2 shows estimates of maximum potential short-term ex-vessel revenue effects for commercial fishermen and estimates of the direction of economic effects for recreational fishermen for the stocks addressed in the 2010 Caribbean ACL Amendment and the 2011 Caribbean ACL Amendment, respectively, under the ‘not subject to overfishing’ status scenario. The values in all tables in this section represent maximum economic effects because they are based on ACLs and not actual landings.

Table 4.1.3.2. Maximum potential annual change in commercial ex-vessel revenue and the direction of economic effects for the recreational and subsistence sectors under **Alternative 2, Preferred Alternative 3**, including **Sub-alternatives 3a-3e** assuming the ‘not subject to overfishing’ status scenario. Change in ACL pounds are shown in parentheses next to commercial or recreational estimated value changes. Source: Estimates made based on changes in pounds in Table 2.2.1.1.7 and Table 2.2.1.1.8 under Section 2.2.1.1 B above and implied ex-vessel revenues from Chapter 3 Table 3.4.1.1.5, Table 3.4.1.1.12, and Table 3.4.1.1.18.

Puerto Rico	Alternative 2 Economic Effects		Preferred Alternative 3 Economic Effects	
	Comm (change in ex-vessel revenues and lbs)	Rec (change in direction of effects)	Comm (change in ex- vessel revenues and lbs)	Rec (change in direction of effects)
Snapper Unit 1	\$62,128 (16,746)	(+) (5,620)	\$62,128 (16,746)	(+) (5,620)
Snapper Unit 2	\$30,727 (8,583)	(+) (2,048)	\$30,727 (8,583)	(+) (2,048)
Snapper Unit 3	\$48,816 (20,340)	(+) (4,892)	\$48,816 (20,340)	(+) (4,892)
Snapper Unit 4	\$51,384 (21,959)	(+) (1,677)	\$51,384 (21,959)	(+) (1,677)
Grouper	\$23,703 (10,442)	(+) (4,542)	\$23,703 (10,442)	(+) (4,542)
Parrotfish	\$5,671 (3,099)	(+) (901)	Sub-alternative 3a	
			No change	
Queen Conch	No change	No change	Sub-alternative 3d	
			No change	
Boxfish	No change		No change	
Goatfish	No change		No change	
Grunts	No change		No change	
Wrasses	No change		No change	
Jacks	No change		No change	
Scups and Porgies	No change		No change	
Squirrelfish	No change		No change	
Triggerfish and Filefish	No change		No change	
Angelfish	(+) (No revenue data) (1,796)	(+) (898)	Sub-alternative 3c	
			No change	
Surgeonfish	(+) (No revenue data) (1,436)	(+) (717)	Sub-alternative 3b	
			No change	
Spiny Lobster	No change		No change	
St. Croix	Alternative 2 Economic Effects in Ex-Vessel Revenues		Preferred Alternative 3 Economic Effects in Ex-Vessel Revenues	
Snapper	\$24,042 (6,056)		\$24,042 (6,056)	
Grouper	\$10,651 (1,790)		\$10,651 (1,790)	
Parrotfish	\$62,684 (14,118)		Sub-alternative 3a	
			No change	
Queen Conch	-\$34,550 (-5,000)		Sub-alternative 3d	
			No change	
Boxfish	No change		No change	

Goatfish	No change	No change
Grunts	No change	No change
Wrasses	No change	No change
Jacks	No change	No change
Scups and Porgies	No change	No change
Squirrelfish	No change	No change
Triggerfish and Filefish	No change	No change
Angelfish	\$180 (60)	Sub-alternative 3c
		No change
Surgeonfish	\$30,043 (6,721)	Sub-alternative 3b
		No change
Spiny Lobster	No change	No change
St. Thomas/St. John	Alternative 2	Preferred Alternative 3
	Economic Effects in Ex-Vessel Revenues	Economic Effects in Ex-Vessel Revenues
Snapper	\$46,506 (7,869)	\$46,506 (7,869)
Grouper	\$18,056 (3,050)	\$18,056 (3,050)
Parrotfish	\$11,125 (2,500)	Sub-alternative 3a
		No change
Queen Conch	No change	Sub-alternative 3d
		No change
Boxfish	No change	No change
Goatfish	No change	No change
Grunts	No change	No change
Wrasses	No change	No change
Jacks	No change	No change
Scups and Porgies	No change	No change
Squirrelfish	No change	No change
Triggerfish and Filefish	No change	No change
Angelfish	\$4,737 (1,579)	Sub-alternative 3c
		No change
Surgeonfish	\$25,857 (5,850)	Sub-alternative 3b
		No change
Spiny Lobster	No change	No change
Caribbean Wide	Alternative 2	Alternative 3
Tilefish	No change	No change
Aquarium Trade Species	(+) (No revenue data) (1,631)	Sub-alternative 3e
		No change

Note: A negative (-) or positive (+) sign representing adverse or beneficial effects, respectively, is used in two situations: 1) where recreational effects cannot be quantified due to lack of value data or 2) A situation where the ACL is combined for both commercial and recreational fishermen (Puerto Rico spiny lobster and St. Croix queen conch).

Note: A “(-) (No revenue data)” or “(+ (No revenue data))” indicates that there are no revenue values available for these species groups/complexes in the trip ticket data. Therefore, economic effects cannot be quantified. We can assume, however, that if the poundage change in ACL is positive, then the economic effects are beneficial and if the poundage change in ACL is negative, then the economic effects are adverse.

Note: The reader should again note that the changes in actual landings resulting from the change in ACLs under each status scenario (‘subject to overfishing’ and ‘not subject to overfishing’) are uncertain. Therefore, the changes in ex-vessel revenue to commercial fishermen and economic effects to recreational and subsistence fishermen noted above are also uncertain and can be thought of as maximum potential changes.

Tables 2.2.1.1.15 and 2.2.1.1.16 provide results for 2010 and 2011 stocks, respectively, under the **Alternative 2** ‘not subject to overfishing’ scenario using recent 2010-2012 data. For the 2010 stocks, when compared to 2010-2011 annual landings, Puerto Rico SU2, St. Croix queen conch, and St. Thomas/St. John grouper exceed their ACLs. Accountability measures do not apply for queen conch but if these fishing trends continue for the other two species, AMs (in the form of early closures) would apply and this would result in short-term economic losses in the form ex-vessel revenue losses of approximately \$442,058 (123,480 pounds) for Puerto Rico Snapper Unit 2 commercial fishermen and approximately \$11,449 (1,934 pounds) for St. Thomas/St. John commercial fishermen. This assumes that recent landings trends would continue.

For the 2011 stocks, the same units exceed their ACL under the **Alternative 2** ‘not subject to overfishing’ scenario as under **Alternative 1** (No Action). While AMs would not apply to USVI angelfish, squirrelfish, and wrasses due to better data reporting resulting in higher landings, AMs would apply to Puerto Rico recreational wrasses, St. Croix spiny lobster, and triggerfish and filefish. Accountability measures (AMs) would apply to these units in the form of early closures and result in adverse economic effects for both recreational and commercial fishermen. As stated above, the adverse economic effects to recreational fishermen cannot be quantified due to a lack of data. If recent landings trends continued, the adverse economic effects for commercial fishermen would come in the form of lost ex-vessel revenues. St. Croix spiny lobster commercial ex-vessel revenue losses would amount to approximately \$17,816 compared to 2011 data (2,401 pounds). St. Croix triggerfish and filefish commercial fishermen would experience ex-vessel revenue losses of approximately \$6,545 using 2011 data (1,474 pounds).

As stated above, under **Preferred Alternative 3**, economic effects are the same as those under **Alternative 2** under both the ‘subject to overfishing’ and ‘not subject to overfishing’ scenarios as discussed above except for parrotfish (**Preferred Sub-alternative 3a**), surgeonfish (**Preferred Sub-alternative 3b**), angelfish (**Preferred Sub-alternative 3c**), queen conch (**Preferred Sub-alternative 3d**), and aquarium trade species (**Preferred Sub-alternative 3e**). For these, results are the same as those under **Alternative 1 (No Action)**.

As previously stated, these adverse economic effects that may occur based on comparisons with recent landings, assume that these recent landings will continue. However, the AMs that would be triggered would come in the form of early closures. The early closures would bring the landings back to within the ACL and an AM would be less likely to be triggered the following year. Therefore, these economic effects are likely short-term.

4.1.4 Direct and Indirect Effects on the Social Environment

Effects from fishery management changes on the social environment are difficult to analyze due to complex human-environment interactions and a lack of quantitative data about that interaction. Generally, social effects can be categorized according to changes in: human behavior (what people do), social relationships (how people interact with one another), and human-environment interactions (how people interact with other components of their environment, including enforcement agents and fishery managers). It is generally accepted that a positive correlation exists between economic effects and social effects. Thus, in Section 4.1.3 (Economic Effects), alternatives predicting positive or negative economic effects are expected to have correlating positive or negative social effects.

When fishermen are referred to in the following analysis, commercial, recreational, and subsistence fishermen are included unless expressly described in the text as only pertaining to one or two specific categories of fishermen.

Alternative 1 (No Action)

Alternative 1 (No action) would retain the current buffer reductions applied to the OFL or ABC, which is used to derive the ACLs for the FMUs included in the reef fish, coral, queen conch, and spiny lobster FMPs. Remaining at the status quo buffer reductions for all FMUs under **Alternative 1** (No action) could result in impacts to fishermen if the overfishing status of an FMU changes, brought about by the inability of fisheries managers to quickly respond to a change in the current status of the fishery through regulations. If the status of an FMU changes to 'subject to overfishing' from 'not subject to overfishing' or 'unknown', there would be no quick mechanism to adjust the ACL to reflect the updated status of the fishery. This could lead to continued overfishing, which could result in negative impacts to fishermen in the long-term resulting from a decrease in the health of fish stocks. Conversely, if an FMU is no longer subject to overfishing, and a more conservative ACL is retained under **Alternative 1** (No action) because the buffer reductions remain at status quo, then fishermen could lose possible positive impacts from the inability to fish at an increased harvest level. Also, if a more conservative ACL is retained, there could be an increased possibility of triggering an AM closure. This could shorten the fishing season and result in decreased fishing opportunities.

Alternative 1 (No action) would retain the included species' ACLs at the status quo level and could continue to provide greater protection for the resource if the ACLs under **Alternative 1** (No action) are less than the ACLs under **Alternative 2** and **Preferred Alternative 3**, as is the case for the majority of the 2010 stocks under a 'not subject to overfishing' scenario in **Alternatives 2** and **Preferred Alternative 3** (provided in Table 2.2.1.1.9). This protection could result in indirect positive effects for fishermen who depend on the resource, including healthier stocks and the possibility of more fish. However, for the 2010 stocks (except for queen conch: the ACL for queen conch in St. Croix would be reduced under **Alternatives 2**, but would remain at the status quo level under **Preferred Sub-alternative 3d**, and the ACL for queen conch in Puerto Rico and St. Thomas/St. John would remain at zero under all alternatives because harvesting of queen conch is prohibited in federal waters of those areas), fishermen could lose possible positive impacts from the ability to fish at an increased harvest level under **Alternative 2** and **Preferred Alternative 3** under a 'not subject to overfishing' scenario (Table 2.2.1.1.9), if catch levels remain at the status quo level in **Alternative 1** (No action).

When recent landings are compared to the ACLs under **Alternative 1** (No action), several of the 2010 stocks exceeded their ACLs when compared to the 2010-2011 average (Table 2.2.1.1.11) and experienced AMs in 2013. These stocks include Puerto Rico SU2 (commercial) and St. Thomas/St. John grouper (commercial). If landing patterns continue, it is expected that these FMUs could experience AMs in future years if ACLs remain at the status quo level under **Alternative 1** (No action). Accountability measures would include closures during the following year which would equal the amount of the overage in landings from the prior year. Fishermen would likely experience negative effects from a reduction in landings due to the AMs experienced under **Alternative 1** (No action). St. Croix queen conch exceeded its status quo ACL under **Alternative 1** (No action) when compared to both the 2010-2011 average and the 2010-2012 average (Table 2.2.1.1.11); however AMs do not apply to queen conch. Although fishermen would not be negatively impacted by a reduction in harvest resulting from an AM, they could be negatively impacted in the long-term (resulting from negative impacts to the resource from continuing to overharvest) under **Alternative 1** (No action), if landing patterns continue.

Retaining status quo ACLs under **Alternative 1** (No action) could positively impact fishermen in the short-term who depend on species within FMUs which could experience a decrease in ACL under the 'subject to overfishing status' scenario possible under **Alternative 2** and **Preferred Alternative 3**. These include the majority of 2011 stocks (except for Puerto Rico angelfish and surgeonfish; St Croix wrasses (remains the same), angelfish, and surgeonfish; and St. Thomas/St. John angelfish and surgeonfish, all of these FMUs would either experience increases in ACL or the ACL would remain the same under **Alternative 2** and **Preferred Alternative 3**). However, under **Alternative 1** (No action) these fishermen could be negatively impacted in the long-term

because the more conservative reduction under **Alternative 2** and **Preferred Alternative 3** would not be applied and the resource could be negatively impacted which could indirectly impact fishermen dependent on the resource.

When 2011 landings are compared to the ACLs under **Alternative 1** (No action), several of the 2011 stocks exceeded their ACLs (Table 2.2.1.1.12). These stocks include Puerto Rico wrasses (recreational); St. Croix angelfish (commercial), spiny lobster (commercial), squirrelfish (commercial), triggerfish and filefish (commercial), and wrasses (commercial); and St. Thomas/St. John angelfish (commercial), squirrelfish (commercial), and wrasses (commercial). However, the landings for St. Croix and St. Thomas/St. John for angelfish, squirrelfish, and wrasses were attributed to enhanced reporting requirements and AMs were not applied. The remainder of these groups experienced AMs in 2013 and fishermen likely experienced negative impacts resulting from a decrease in allowable harvest (because AMs include closures during the following year which equal the amount of the overage in landings from the prior year). Also, when the 2010-2012 landings average is compared to the ACLs under **Alternative 1** (No action), several stocks exceeded their ACLs (Table 2.2.1.1.12). These FMUs include St. Croix and St. Thomas/St. John angelfish (commercial), squirrelfish (commercial), and wrasses (commercial). High landings for these groups were attributed to enhanced reporting requirements and AMs were not applied in 2014. If landings patterns remain the same, the above mentioned 2011 stocks would continue to exceed their ACLs under **Alternative 1** (No action). If AMs are applied for any of these groups, fishermen would experience negative effects under **Alternative 1** (No action), resulting from a decrease in allowable harvest during the following year.

Alternative 2 and Preferred Alternative 3 under the ‘Subject to Overfishing’ Status Scenario

As described in section 4.1.3, under a ‘subject to overfishing’ status scenario, the ACLs for the majority of the 2010 stocks would remain the same under **Alternative 2** as under **Alternative 1** (No action). However, in this scenario under **Alternative 2**, the ACL for St. Croix queen conch would decrease. This decrease could negatively impact queen conch fishermen in the short-term because their catch and resulting benefits would be decreased; however it could indirectly benefit fishermen in the long-term if the resource is positively impacted by a decrease in harvest through healthier stocks and the availability of more fish.

When recent landings (2010-2011 average) are compared to the ACLs under **Alternative 2** under the ‘subject to overfishing’ status scenario, several of the 2010 stocks exceeded their ACLs (Table 2.2.1.1.13). These stocks also exceeded their ACLs under **Alternative 1** (No action) and include Puerto Rico SU2 (commercial), St. Thomas/St. John grouper (commercial), and St. Croix queen conch. If landings patterns remain the same, it is expected that these FMUs could experience AMs under **Alternative 2** (except for queen conch because AMs do not apply to queen conch). Accountability measures would include closures during the following year

which would equal the amount of the overage in landings from the prior year. Fishermen would likely experience negative effects from a reduction in landings due to the AMs experienced under **Alternative 2**. Because the ACLs for Puerto Rico SU2 (commercial) and St. Thomas/St. John grouper (commercial) would remain the same under a ‘subject to overfishing’ scenario in **Alternative 2**, overages in landings would remain the same and the negative effects to fishermen the following year would thus be the same as under **Alternative 1** (No action). St. Croix queen conch exceeded its status quo ACL under **Alternative 2** when compared to both the 2010-2011 average; however AMs do not apply to queen conch. Although fishermen would not be negatively impacted by a reduction in harvest resulting from an AM, they would likely be negatively impacted in the long-term (resulting from negative impacts to the resource from continuing to overharvest) under **Alternative 2**, if landing patterns continue. Also, because the ACL for St. Croix queen conch would decrease under **Alternative 2** under the ‘subject to overfishing’ status scenario, overages in landings would be greater under **Alternative 2** than under **Alternative 1** (No Action). Overharvesting would likely occur at a greater level under **Alternative 2** which could increase the long-term negative impacts to fishermen.

Under a ‘subject to overfishing’ status scenario, the ACLs for the majority of 2011 stocks would decrease under **Alternative 2** (the exceptions include: Puerto Rico angelfish and surgeonfish, St. Croix angelfish and surgeonfish, St. Thomas/St. John angelfish and surgeonfish, and Caribbean-wide aquarium trade species FMUs which would experience an increase in ACL, and the ACL for St. Croix wrasses which would remain the same under **Alternative 2**). This would likely negatively affect fishermen in the short-term because their allowable catch and resulting benefits would decrease. However, it could indirectly benefit fishermen in the long-term if the resource is positively impacted by a decrease in harvest through healthier stocks and the availability of more fish. Fishermen who catch species that would experience an increase in ACL under a ‘subject to overfishing’ status scenario under **Alternative 2** (Puerto Rico angelfish and surgeonfish, St. Croix angelfish and surgeonfish, St. Thomas/St. John angelfish and surgeonfish, and Caribbean-wide aquarium trade species FMUs) would likely benefit in the short-term from an increased ability to harvest these fish. Whereas, fishermen targeting wrasses in St. Croix would not receive any additional short-term benefits under a ‘subject to overfishing’ status scenario under **Alternative 2**, as the ACL would remain the same.

When 2011 landings are compared to the ACLs under **Alternative 2** under the ‘subject to overfishing’ status scenario (Table 2.2.1.1.14), the same groups exceeded their ACLs under **Alternative 1** (No Action) including Puerto Rico wrasses (recreational); St. Croix angelfish (commercial), spiny lobster (commercial), squirrelfish (commercial), triggerfish and filefish (commercial), and wrasses (commercial); and St. Thomas/St. John angelfish (commercial), squirrelfish (commercial), and wrasses (commercial). In addition, Puerto Rico wrasses (commercial) also exceeded their ACL under **Alternative 2** under the ‘subject to overfishing’ status scenario. The majority of these groups exceed their ACL by a greater amount under

Alternative 2 than under **Alternative 1** (No Action) (except for angelfish which would decrease under **Alternative 2**). The landings for St. Croix and St. Thomas/St. John for angelfish, squirrelfish, and wrasses were attributed to enhanced reporting requirements and AMs do not need to be applied. Because AMs are not required to be applied, fishermen would likely not experience any negative impacts resulting from overages under **Alternative 2** under the ‘subject to overfishing’ status scenario, if landing patterns remain the same. However, the remainder of these groups would experience accountability measures if landing patterns remain the same and fishermen would likely experience negative impacts resulting from a decrease in allowable harvest (because AMs include closures during the following year which equal the amount of the overage in landings from the prior year). Under **Alternative 2**, overages in landings for these groups would be larger and the negative effects to fishermen the following year would likely be greater, than under **Alternative 1** (No action).

Also, when the 2010-2012 landings average is compared to the ACLs under **Alternative 2** under the ‘subject to overfishing’ scenario (Table 2.2.1.1.14), the same 2011 stocks exceeded their ACLs as under **Alternative 1** (No Action). These FMUs include St. Croix and St. Thomas/St. John angelfish (commercial), squirrelfish (commercial), and wrasses (commercial). In addition, St. Croix triggerfish and filefish (commercial) exceeded the ACL under **Alternative 2** under the ‘subject to overfishing’ scenario. The majority of these groups exceeded their ACL by a greater amount under **Alternative 2** than under **Alternative 1** (No Action) (except for angelfish which would decrease under **Alternative 2**). Landings for St. Croix and St. Thomas/St. John for angelfish, squirrelfish, and wrasses were attributed to enhanced reporting requirements and AMs do not need to be applied in 2014. Because AMs are not required to be applied, fishermen would likely not experience any negative impacts resulting from overages under **Alternative 2** under the ‘subject to overfishing’ status scenario, if landing patterns remain the same. However, the remainder of these groups would experience accountability measures if landing patterns remain the same and fishermen would likely experience negative impacts resulting from a decrease in allowable harvest (because AMs include closures during the following year which equal the amount of the overage in landings from the prior year). Under **Alternative 2**, overages in landings for these groups would be larger and the negative effects to fishermen the following year would likely be greater, than under **Alternative 1** (No action).

Under a ‘subject to overfishing’ status scenario, the ACLs under **Preferred Alternative 3** would be the same for 2010 and 2011 stocks as under **Alternatives 2**. The effects would thus be the same under both **Alternative 2** and **Preferred Alternative 3** for the majority of 2010 and 2011 stocks. However, the exceptions to this rule includes **Preferred Sub-alternatives 3b-3e** which include no change from the status quo presented in **Alternative 1** (No action) for St. Croix queen conch, angelfish, and surgeonfish; St. Thomas/St. John angelfish and surgeonfish, Puerto Rico angelfish and surgeonfish, and the Caribbean-wide aquarium trade species FMUs. However, under **Alternative 2**, these FMUs include increases (St. Croix angelfish and surgeonfish; St.

Thomas/St. John angelfish and surgeonfish, Puerto Rico angelfish and surgeonfish, and the Caribbean-wide aquarium trade species) or decreases (St. Croix queen conch). Annual catch limits for these units would remain at status quo levels under **Preferred Sub-alternatives 3b-3e** which could positively affect fishermen indirectly in the long-term. Remaining at this more conservative catch level could benefit the resource through healthier stocks, the availability of more fish, and through the services these species provide (such as to the ecology of coral reefs by angelfish and surgeonfish). However, in the short-term, fishermen could lose the possible positive effects from the ability to fish at an increased allowable harvest level which would be available under **Alternative 2** (with the exemption of queen conch, whose harvest would be decreased as discussed above).

When recent landings are compared to the ACLs under **Preferred Alternative 3** under the ‘subject to overfishing’ status scenario, the social effects would be the same as under **Alternative 2** for the majority of 2010 and 2011 stocks. However, the exceptions to this rule includes **Preferred Sub-alternatives 3b-3e** which include no change from the status quo presented in **Alternative 1** (No action) for parrotfish, surgeonfish, angelfish, queen conch, and aquarium trade species. The effects for these FMUs would thus be the same as the social effects presented for **Alternative 1** (No action).

Alternative 2 and Preferred Alternative 3 under the ‘Not Subject to Overfishing’ and ‘Unknown’ Status Scenario

As described in section 4.1.3, under a ‘not subject to overfishing’ or ‘unknown’ status scenario, the ACLs for nearly all 2010 stocks (except for queen conch: the ACL for queen conch in St. Croix would be reduced under **Alternative 2**, and the ACL for queen conch in Puerto Rico and St. Thomas/St. John would remain at zero under all alternatives because harvesting in the federal EEZ is prohibited for queen conch in those areas) and some 2011 stocks (angelfish, surgeonfish, and aquarium trade) would increase. The resulting increased ACLs would likely positively affect fishermen in the short-term. However, it is possible that fishermen could experience negative effects in the long-term because the resource would not experience benefits brought about by a decrease in catch (including the possibility of healthier stocks, availability of more fish, and through the services these species provide). A number of 2011 stocks would remain the same under **Alternative 2** as under **Alternative 1** (No action).

When recent landings are compared to the ACLs under **Alternative 2** under the ‘not subject to overfishing’ status scenario, several of the 2010 stocks exceeded their ACLs (Table 2.2.1.1.15). These stocks also exceeded their ACLs under **Alternative 1** (No action) and include Puerto Rico SU2 (commercial), St. Thomas/St. John grouper (commercial), and St. Croix queen conch (commercial). If landings patterns remain the same, it is expected that these FMUs could experience AMs under **Alternative 2** (except for queen conch because AMs do not apply to

queen conch). Accountability measures would include closures during the following year which would equal the amount of the overage in landings from the prior year. Fishermen would likely experience negative effects from a reduction in landings due to the AMs experienced under **Alternative 2**. Because the ACLs for Puerto Rico SU2 (commercial) and St. Thomas/St. John grouper (commercial) would increase under a ‘not subject to overfishing’ scenario under **Alternative 2**, overages in landings would be smaller and the negative effects to fishermen the following year would likely be less, than under **Alternative 1** (No action). St. Croix queen conch exceeded its status quo ACL under **Alternative 2** when compared to recent landings; however AMs do not apply to queen conch. Although fishermen would not be negatively impacted by a reduction in harvest resulting from an AM, they would likely be negatively impacted in the long-term (resulting from negative impacts to the resource from continuing to overharvest) under **Alternative 2**, if landing patterns continue. Also, because the ACL for St. Croix queen conch would decrease under **Alternative 2** under the ‘not subject to overfishing’ status scenario, overages in landings would be greater under **Alternative 2** than under **Alternative 1 (No Action)**. Overharvesting would likely occur at a greater level under **Alternative 2** which could increase the long-term negative impacts to fishermen.

When recent landings are compared to the ACLs under **Alternative 2** under the ‘not subject to overfishing’ status scenario, several 2011 stocks exceeded their ACLs (Table 2.2.1.1.16). These stocks also exceeded their ACL under **Alternative 1** (No Action) and include Puerto Rico wrasses (recreational); St. Croix angelfish (commercial), spiny lobster (commercial), squirrelfish (commercial), triggerfish and filefish (commercial), and wrasses (commercial); and St. Thomas/St. John angelfish (commercial), squirrelfish (commercial), and wrasses (commercial). The landings for St. Croix and St. Thomas/St. John angelfish, squirrelfish, and wrasses were attributed to enhanced reporting requirements and AMs were not applied. If landings patterns remain the same and higher landings continue to be attributed to enhanced reporting requirements, fishermen involved in these fisheries would likely not experience negative effects resulting from exceeding the ACL under **Alternative 2** under the ‘not subject to overfishing’ status. However, the remainder of these groups would experience AMs and fishermen would likely experience negative impacts resulting from a decrease in allowable harvest (because AMs include closures during the following year which equal the amount of the overage in landings from the prior year) **Alternative 2** under the ‘not subject to overfishing’ status scenario. Under **Alternative 2** under the ‘not subject to overfishing’ status scenario, overages in landings for these groups would be nearly the same as under **Alternative 1 (No action)** and thus effects to fishermen would be expected to be the same.

Under a ‘not subject to overfishing’ or ‘unknown’ status scenario, the ACLs under **Preferred Alternative 3** would be the same for 2010 and 2011 stocks as under **Alternative 2**. The social effects would thus be the same under both **Alternative 2** and **Preferred Alternative 3** for the majority of 2010 and 2011 stocks. However, the exceptions to this rule includes **Preferred Sub-**

alternatives 3a-3e which include no change from the status quo presented in **Alternative 1 (No action)** for St. Croix parrotfish, queen conch, angelfish, and surgeonfish; St. Thomas/St. John parrotfish, angelfish, and surgeonfish, Puerto Rico parrotfish, angelfish, and surgeonfish, and the Caribbean-wide aquarium trade FMUs. However, under **Alternative 2**, these FMUs include increases (St. Croix, St. Thomas/St. John, and Puerto Rico parrotfish, angelfish, and surgeonfish, and the Caribbean-wide aquarium trade species) or decreases (St. Croix queen conch).

When recent landings are compared to the ACLs under **Preferred Alternative 3** under the ‘not subject to overfishing’ status scenario, the social effects would be the same as under **Alternative 2** for the majority of 2010 and 2011 stocks. However, the exceptions to this rule includes **Preferred Sub-alternatives 3b-3e** which include no change from the status quo presented in **Alternative 1 (No action)** for parrotfish, surgeonfish, angelfish, queen conch, and aquarium trade species. The effects for these FMUs would thus be the same as the social effects presented for **Alternative 1 (No action)**.

4.1.5 Direct and Indirect Effects on the Administrative Environment

An action becomes more administratively burdensome when it triggers management review and action more frequently. **Alternative 1** would not establish a control rule to adjust the buffer applied to the OFL or the ABC and derive the ACL. Keeping current buffers and thus ACL values for managed species would not have any administrative effects because no action would be taken. However, there would not be a responsive mechanism in place to expedite the adjustment of the OFL or ABC to derive the ACL for any FMU as their overfishing status changes. If the Council desires to adjust the buffer applied to the OFL or ABC for that particular unit to reflect the change in overfishing status, this would add the administrative burden of having to individually amend the corresponding FMP through the lengthier plan amendment process, limiting the Council’s ability to implement regulatory changes in a timely manner.

In addition, if the status of an FMU change to ‘subject to overfishing’ from ‘not subject to overfishing’ or ‘unknown’, and there is no expeditious mechanism in place to adjust the buffer in response to a change in status, the ACL currently in place may not be precautionary enough and could led the stock to become subject to overfishing and/or overfished. This would add an administrative burden because it would elicit further resource-intensive action to rebuild stocks under provisions of the Magnuson-Stevens Act.

Under the no action alternative (**Alternative 1**), if the status of a unit changes from ‘subject to overfishing’ to ‘not subject to overfishing’ in a particular year, the ACL currently in place for that unit may end up being too restrictive. In the short term, depending on harvest patterns, a more restrictive or conservative ACL may increase the possibility of triggering AM closures,

when compared to a less restrictive ACL, adding the administrative burden of implementing the closure. In contrast, in the long term, assuming the ACL is not exceeded, a more restrictive ACL would prevent overfishing, and thus would minimize future administrative actions and thus effects.

The establishment of the ACL Control Rule proposed in **Alternative 2** and in **Preferred Alternative 3** would add the short term administrative burden of establishing the process in the regulations and implementing the action. However, in the long term it would simplify the process of adjusting the buffers applied to the OFL if the status of a unit changes in a particular year

Alternative 2 would apply the ACL Control Rule to all managed species for which harvest is allowed. **Alternative 2** would result in a more restrictive ACL if in a particular year a unit is determined to be ‘subject to overfishing’. In the long term, a more restrictive ACL would aid in ending overfishing, and thus would reduce the administrative burden of having to take additional measures to end overfishing for the species. However, when compared to a less restrictive ACL, the short term impact of a more conservative ACL may be an increased likelihood of triggering AM closures and thus adding the administrative burden of implementing the closures. This short term administrative effect becomes even more evident for the queen conch, a species with special management measures established in the 2010 Caribbean ACL Amendment. As discussed in Section 2.2.1, applying a buffer reduction to the queen conch’s ABC would certainly reduce the current harvest allowed in federal waters under any of the ‘overfishing/not subject to overfishing’ status scenarios. A potential decrease in harvest opportunities for the queen conch would be incompatible with the present regulatory environment in federal waters and would add the administrative burden of enforcing regulations that are not compatible with the USVI. **Alternative 2** would not affect the current administrative environment for the queen conch in Puerto Rico and St. Thomas/St. John because harvest is prohibited in those areas and the ACL is zero.

Conversely, if adjusting the OFL buffer reduction as a result of a change in the overfishing status results in less restrictive or insufficiently precautionary ACLs, this could lead stocks to become ‘subject to overfishing’ or become overfished. Then the action could become administratively burdensome because it would elicit further resource-intensive action to end overfishing or, if overfished, to rebuild stocks under Magnuson-Stevens Act provisions. For surgeonfish, angelfish, and aquarium trade species, an additional administrative burden may be added by **Alternative 2** because it would duplicate efforts already conducted in the 2010 and 2011 Caribbean ACL Amendments, where similar buffers to the ones proposed in this action were already considered and subsequently rejected by the Council (NMFS 2012a, b).

Management reference points for all Council managed species may be reevaluated in the near future during the development of the Island-Based FMPs for each of Puerto Rico, St. Croix, and St. Thomas/St. John.

The administrative effects expected from **Preferred Alternative 3** are almost similar to the effects expected from **Alternative 2** discussed above, except for the administrative effects resulting from changes to parrotfish, surgeonfish, angelfish, queen conch, and aquarium trade species reduction buffers. In general, the establishment of the ACL Control Rule proposed in **Preferred Alternative 3** would add the short term administrative burden of establishing the process in the regulations and implementing the action. For all managed species except for the species mentioned above, **Preferred Alternative 3** would, in the long term, simplify the process of adjusting the buffers applied to the OFL if the status of a unit changes in a particular year, benefiting the administrative environment.

Preferred Sub-alternatives 3a-3e provide for exemptions to the control rule and the administrative effects of any of these sub-alternatives would be similar to those described for **Alternative 1**. Under any of **Preferred Sub-alternatives 3a-3e**, the relationship between the OFL or ABC and the ACL would remain as status quo. Keeping current buffers and thus ACL values for any of these special management units translates into less administrative burden because it would support current management measures. However, there would not be a responsive mechanism in place to expedite the adjustment of the OFL or ABC to derive the ACL for these units if their overfishing status changes. If the Council desires to adjust the buffer for a particular unit to reflect the change in overfishing status, this would add the administrative burden of having to individually amend the corresponding FMP through the lengthier plan amendment process.

In summary, in the short term **Alternative 1** would be less administratively burdensome because it will not prompt further action. In the long term, both **Alternative 2** and **Preferred Alternative 3**, when compared to **Alternative 1**, would result in the greatest administrative benefit because both would allow for more responsive management sensitive to the status of the fisheries. Implementing the control rule under either **Alternative 2** or **Preferred Alternative 3** provides the Council with the flexibility to respond quicker to changes in the status of the fisheries instead of having to go through the lengthier full plan amendment process. When compared to **Alternative 2**, **Preferred Alternative 3** would be less administratively burdensome because it would not modify current management measures for parrotfish, angelfish, surgeonfish, queen conch, and/or aquarium trade species. This of course depends on the suite of sub-alternatives chosen.

4.2 Cumulative Effects Assessment

As directed by the Council on Environmental Quality (CEQ) regulations, federal agencies are mandated to assess not only the direct and indirect impacts, but the cumulative impacts of proposed actions as well. The CEQ regulations define a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.” Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 C.F.R. 1508.7). Cumulative effects can either be additive or synergistic. A synergistic effect occurs when the combined effects are greater than the sum of the individual effects.

This section uses an approach for assessing cumulative effects based upon guidance offered by the CEQ publication - Considering Cumulative Effects Under the National Environmental Policy Act (1997). The report outlines 11 items for consideration in drafting a cumulative effects assessment (CEA) for a proposed action.

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.

The 1997 CEQ cumulative impacts guidance states this step is accomplished through three activities as follows:

- I. The direct and indirect effects of the proposed action (Chapter 4);
- II. Which resources, ecosystems, and human communities are affected (Chapter 3); and
- III. Which effects are important from a cumulative effects perspective (information revealed in this CEA).

2. Establish the geographic scope of the analysis.

The immediate areas affected by this action and analyzed in this CEA are the federal waters of the U.S. Caribbean. These waters extend off Puerto Rico from 9 nautical miles (nm) to 200 nm and from 3 nm to 200 nm off the USVI. Managed resources, non-target species, habitat, and protected species present in federal waters of the U.S. Caribbean are also within this geographic scope. The immediate areas affecting humans would include fishing communities of the USVI and Puerto Rico. These are discussed in Sections 3.4.2 and 3.4.3. A description of the geographic range for species affected by this amendment can be found in Section 3.1. The species affected include all Council managed species for which harvest is allowed and which are included in the four Council FMPs: Queen Conch, Reef Fish, Spiny Lobster, and Corals and Reef Associated Plants and Invertebrates. The ranges of other protected species affected by this action are described in Section 3.2.3.

3. Establish the timeframe for the analysis.

The timeframe for the CEA should take into account both historical efforts to manage reef fish, queen conch, spiny lobster, and coral fisheries resources in federal waters, as well as future considerations if this comprehensive amendment and its subsequent regulation are approved and implemented by NMFS. The timeframe for the CEA begins with the implementation of the council FMPs: Queen Conch FMP in 1997, Reef Fish FMP in 1985, the Spiny Lobster FMP in 1981, and the Corals FMP in 1994. Sections 1.5.1 and 1.5.2 describe the history of management for resources in these FMPs related to the action proposed in this amendment. A complete history of management can be found in the 2010 and 2011 Caribbean ACL amendments (CFMC 2011a, b).

Biological and socio-economic information in this amendment is updated through the most recent actions affecting queen conch, reef fish, corals, and spiny lobster management. Management actions included in the 2010 Caribbean ACL Amendment (CFMC 2011a) for the reef fish and queen conch, and in the 2011 Caribbean ACL Amendment (CFMC 2011b) for spiny lobster and corals, are summarized in Section 1.5.1. Caribbean actions implemented in 2013 affected the Corals and Reef Associated Plants and Invertebrates (Coral), Queen Conch, and Reef Fish FMPs. Updated management histories for these FMPs can be found in: Amendment 4 to the Coral FMP (CFMC 2013a), Regulatory Amendment 2 to the Queen Conch FMP (CFMC 2013b), and Regulatory Amendment 4 to the Reef Fish FMP (CFMC 2013c), respectively. Management measures in these amendments are summarized in Section 1.5.2. The Generic Essential Fish Habitat Amendment (CFMC 1998), EFH-FEIS (CFMC 2004), Griffith et al. (2007), Stoffle et al. (2009), Valdés-Pizzini et al. (2010), and Grace-Mccaskey (2012) provide more extensive characterization of fishing-dependent communities.

4. Identify the other actions affecting the resources, ecosystems, and human communities of concern.

The following are some past, present, and future actions that could impact the reef fish, queen conch, spiny lobster, coral resources in the U.S. Caribbean EEZ, as well as the fishing communities that depend on those resources.

Past

The CEA included in the 2010 Caribbean ACL Amendment (CFMC 2011a) analyzed cumulative effects to the queen conch and reef fish, and the CEA included in the 2011 Caribbean ACL Amendment (CFMC 2011b) analyzed cumulative effects to the spiny lobster and coral resources in the U.S. Caribbean EEZ. Both of these CEAs also described baseline economic and social conditions for fishing communities in Puerto Rico and the USVI. These CEAs described the effects of the establishment of ACLs, AMs, and the redefinition of management reference points for queen conch, reef fish, spiny lobster, and corals in the U.S Caribbean and how those actions would serve to restore and stabilize natural trophic and competitive relationships, rebuild species

abundances, re-establish natural sex ratios, contribute to the long-term health of the ecosystem, and reinvigorate sustainable fisheries while minimizing to the extent practicable negative socioeconomic impacts. The analyses of cumulative effects listed in each of the 2010 and 2011 Caribbean ACL Amendments are still considered to be accurate and useful at the present time.

Amendment 4 to the Coral FMP removed seagrass species from the FMP. The CEA included in this amendment analyzed cumulative effects to the corals and reef associated plants and invertebrates in federal water resulting from this action. The CEA concluded that the action in that amendment was an administrative action and no cumulative effects were expected from it. The analysis in this CEA is still considered to be accurate and useful at the present time.

The CEA in Regulatory Amendment 2 to the Queen Conch FMP analyzed cumulative effects of modifying trip and bag limits for the harvest of queen conch in the EEZ. This CEA revealed no significant, cumulative adverse effects on the biological/ecological and socio-economic environments. The action in this amendment was expected to only minimally affect the rate at which the ACL is reached; therefore, it was considered to be consistent with the queen conch rebuilding plan, the FMP, FMP amendments, and the SEDAR assessment (SEDAR 14, NMFS 2007). The analysis of cumulative effects listed in Regulatory Amendment 2 is still considered to be accurate and useful at the present time.

There is currently a petition to NMFS to list the queen conch as threatened or endangered under the Endangered Species Act. The petition listed the following threats, among others, as reasons for the listing: overharvest from commercial fisheries, loss of nursery habitat, inadequate regulations, and water pollution. On August 24, 2012, NMFS determined the petition presented substantial information indicating that listing may be warranted and filed a positive 90-day finding in the Federal Register (FR 77 51763); NOAA Fisheries Service, FAQs, <http://sero.nmfs.noaa.gov/pr/esa/ESA%20Petition/FAQs%20Queen%20conch>.

The CEA included in Regulatory Amendment 4 to the Reef Fish FMP (CFMC 2013c) revealed no significant, cumulative adverse effects on the biological environment. This CEA concluded that to the extent that establishing minimum size limits for harvesting parrotfish can prevent overfishing and assist in rebuilding overfished stocks, positive long-term benefits to the biological and socio-economic environments should be expected. The analysis of cumulative effects listed in Regulatory Amendment 4 is still considered to be accurate and useful at the present time.

Present and Reasonably Foreseeable Future

Island-based FMPs are presently being developed for the U.S. Caribbean, and when put in place will replace the present Reef Fish, Spiny Lobster, Queen Conch, and Corals and Reef Associated Plants and Invertebrates FMPs specific to Puerto Rico, St. Thomas/St. John, and St. Croix. This

action could affect the way the queen conch, reef fish, spiny lobster, and coral resources are managed in the U.S. Caribbean, as management could be tailored to each island or island group. It is possible that through these FMPs, management reference points and ACLs will be revisited. How the action proposed in this comprehensive amendment would be affected by the creation of Island-based FMPs is currently unknown.

The Council is also currently developing an action to modify seasonal closures in three managed areas in western Puerto Rico, Abrir la Sierra Bank, Tourmaline, and Bajo de Sico. This action could affect the way the fishery resources are managed in those federal waters.

5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.

In terms of the biophysical environment, the resources and ecosystems identified in earlier steps (e.g., steps 1 and 2) of the CEA are the reef fish, spiny lobster, coral resources, and queen conch directly affected by the regulations, and those species (i.e., *Acropora* spp.) that are indirectly affected by the regulations. The human environment identified in earlier steps of the CEA is composed of the fishing communities of Puerto Rico and the USVI that depend on those resources and the ecosystem services they provide.

Information on the physical, biological, ecological, social, and economic environments affecting the identified resources is provided in Chapter 3 of this document. Section 2.2.2 describes the current status of the stocks affected by this comprehensive amendment and how the changes proposed in this amendment would affect the current ACLs for those stocks. There are currently four stocks determined to be overfished: queen conch, grouper unit 1 (Nassau grouper), grouper unit 2 (goliath grouper), and grouper unit 4 (yellowfin, black, red, and tiger). These stocks are currently under rebuilding plans. There are no stocks currently subject to overfishing in the U.S. Caribbean. Section 3.3.3 provides an overview of how status determinations are made for Caribbean stocks.

6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.

This section examines whether resources, ecosystems, and human communities are approaching conditions where additional stresses could have an important cumulative effect beyond any current plan, regulatory, or sustainability threshold (CEQ 1997). Sustainability thresholds can be identified for some resources, which are levels of impact beyond which the resources cannot be sustained in a stable state. Other thresholds are established through numerical standards, qualitative standards, or management goals. This CEA should address whether thresholds could be exceeded because of the contribution of the proposed action to other cumulative activities affecting resources.

Definitions of overfishing and overfished for Council managed species were identified in the 2005 SFA Amendment (CFMC 2005). Numerical values of thresholds for the queen conch and reef fish such as MSY proxies, OY, and OFL were updated in the 2010 Caribbean ACL Amendment (CFMC 2011a). For spiny lobster and coral resources these values were updated in the 2011 Caribbean ACL Amendment. These are discussed in Section 1.6 of this document. Both of these amendments became effective in 2012. At the time of preparation of this environmental assessment, the values for management reference points and ACLs for all managed species established in the 2010 and 2011 Caribbean ACL Amendments are still valid.

Stresses affecting fishery resources and protected resources as well as the human communities that depend on those resources include, but are not limited to, habitat quality and anthropogenic threats (e.g., habitat loss and degradation, sedimentation, pollution, water quality, overharvest). Some managed species may be more sensitive to the quality of their environment than others. For example, any changes in benthic conditions resulting from land based increases in sedimentation or turbidity will adversely affect the available productive habitat for queen conch (Appeldoorn et al. 2011) and corals, for example.

Other factors directly affecting the human communities include high fuel costs, increased seafood imports, restricted access to traditional fishing grounds, and regional economies. Increased seafood imports are significant as it relates to market competition, where a glut of fish products can flood the market and lower ex-vessel prices. Once market channels are lost to imported seafood products it may also be hard for fishery participants to regain those channels (WPFMC 2009). Effects on the regional economy, for example the closure of the Hovensa Petroleum Refinery Plant of St. Croix in 2012, which left more than 1,200 people without work, may increase the community dependence on local fisheries as their main source of income and food (<http://www.caribjournal.com/2012/08/12/usvi-seeks-to-reopen-hovensa-refinery-possibly-under-new-ownership/>) (NMFS 2014).

Environmental changes (e.g., potential threats from climate change, ocean acidification) can also affect fishery populations, protected resources, and the people and communities that depend on those resources. How global climate change will affect reef fish, spiny lobster, queen conch, and coral resources is presently unknown. Climate change can affect marine ecosystems through ocean warming by increased thermal stratification, reduced upwelling, sea level rise, increases in wave height and frequency, loss of sea ice, and increased risk of diseases in marine biota, among other things. Changes in ocean temperatures are been linked to shifting fish stock distributions and abundances in many marine ecosystems, and these impacts are expected to increase in the future (NMFS 2014b, Assessing the Vulnerability of Fish Stocks in a Changing Climate <http://www.st.nmfs.noaa.gov/ecosystems/climate/activities/assessing-vulnerability-of-fish-stocks>).

Excess carbon dioxide (CO₂) dissolves into the ocean and is converted to corrosive carbonic acid, a process known as “ocean acidification.” At the same time, the CO₂ also supplies carbon that combines with calcium already dissolved in seawater to provide the main ingredient for shells, calcium carbonate (CaCO₃), the same material found in chalk and limestone (Oceanus 2013). Organisms that exert low biological control over calcification directly deposit CaCO₃ along their inner shell walls, and consequently, they depend on a sufficient ambient carbonate concentration to build shells successfully. Commercially valuable mollusks such as bivalves (e.g., scallops, oysters) and some gastropods (e.g., conchs) use this method to build shells (Cooley and Doney 2009). Corals also depend on carbonate to build their skeletons. The net responses of organisms to rising CO₂ will vary depending on often opposing sensitivities to decreased seawater pH, carbonate concentration, and carbonate saturation state, and to elevated oceanic total inorganic carbon and gaseous CO₂ (Cooley and Doney 2009). Increased ocean acidity caused by elevated CO₂ could directly damage organisms by partially dissolving their shells (Oceanus 2013, <https://www.whoi.edu/oceanus/viewArticle.do?id=52990>) or by decreasing growth rates. Larval and juvenile organisms are particularly susceptible. In the way that coral reef habitat becomes less available, fish that depend on coral reefs as sources of food, shelter, and nurseries may be affected too (Harrould-Kolieb et al. 2010). Other species with more protective coverings on their shells and skeletons, such as crustaceans, temperate urchins, mussels, and coralline red algae may be less vulnerable to the acidified seawater (Oceanus 2013). However the specifics of how ocean acidification affects these species are not well understood.

The levels of impacts resulting from climate change and ocean acidification cannot be quantified at this time, nor is the exact timeframe known in which these impacts will occur. However, projections based on the Intergovernmental Panel on Climate Change’s (IPCC) Special Report on Emissions Scenarios (SRES) give a reduction in average global surface ocean pH of between 0.14 and 0.35 units during the 21st century (Climate Change 2007). The actions in this comprehensive amendment are not expected to increase or decrease the potential impacts of global climate change and ocean acidification on fishery resources and other protected resources.

7. Define a baseline condition for the resources, ecosystems, and human communities.

The purpose of defining a baseline condition for the resource and ecosystems in the area of the proposed action is to establish a point of reference for evaluating the extent and significance of expected cumulative effects.

For a detailed discussion of the baseline condition of the reef fish and queen conch, please see the 2010 Caribbean ACL Amendment (CFMC 2011a), the 2011 Caribbean ACL Amendment for spiny lobster and coral resources, and the history of management and biological and ecological environment sections of this comprehensive amendment (Sections 1.5 and 3.2, respectively). Baseline information for the queen conch, mutton snapper, and yellowfin grouper can be found

in SEDAR 14 (NMFS 2007). Baseline information on several other species can be found in SEDAR 8A (Spiny lobster and yellowtail snapper (NMFS 2005), SEDAR 26 (queen snapper, silk snapper, and redbelt parrotfish, SEDAR 30 (blue tang and queen triggerfish), and SEDAR 35 (red hind grouper) (<http://www.sefsc.noaa.gov/sedar/>). The information included in the referenced SEDAR reports and CFMC (2011a, b) was reviewed and found to be relevant. The referenced SEDAR reports describe general management information for the specific species (status, stock exploitation status, stock biomass status), specific management criteria (MSY, OY), stock rebuilding information (if applicable), regulatory history, and biological and life history descriptions, among other. Section 1.5 of this comprehensive amendment and environmental assessment provides a description of the history of management in federal waters including the most recent management actions which affected queen conch, reef fish, and corals.

Section 2.2.2 describes the current status of U.S Caribbean managed stocks. The most recent status of the managed stocks can also be found in the most recent report to Congress on the Status of U.S. Fisheries (NMFS Status of U.S. Fisheries, 4th Quarter 2013, <http://www.nmfs.noaa.gov/sfa/statusoffisheries/2013/fourth/Q4%202013%20Stock%20Status%20Tables.pdf>).

Protected species in the affected environment are described in Section 3.2.3 of this amendment, and include sea turtles, marine mammals, and corals. The status and health of EFH for the managed species has been extensively described (CFMC 1998, 2004, 2011c). The Council, NMFS, and other federal and local agencies have designated numerous areas in the Caribbean to protect and conserve EFH. These areas protect EFH from a wide variety of direct impacts, including loss of fishing gear, restricted use of certain fishing gears, and damage from anchors.

8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.

This proposed action would adjust the buffer reduction that is applied to the OFL or to the ABC to derive the ACL for managed species. The effects of the proposed action on the physical, biological, social, economic, and administrative environment are discussed in Chapter 4 of this EA. Table 4.2.1 below summarizes the cause-and-effect relationships of establishing and modifying management reference points within the time period of the Cumulative Effects Assessment (CEA) and regulatory action related to the establishment of management reference points.

Table 4.2.1. Cause and Effect Relationships within the time period of the CEA.

Time Period /Dates	Cause (Management Action)	Observed and/or Expected Effects
Effective date November 2005	<p>Comprehensive Sustainable Fisheries Act Amendment (CFMC 2005)</p> <ol style="list-style-type: none"> 1) Established biological reference points and stock status criteria for reef fish, spiny lobster, queen conch, and corals 2) Established rebuilding schedules for queen conch, Grouper Unit 1,2, and 4 3) Designated EFH and HAPCs for managed species 	<p>Reduce fishing mortality and help rebuild overfished stocks.</p> <p>Describe and identify EFH according to functional relationships between life history stages of federally managed species and Caribbean marine and estuarine habitats.</p>
Effective date January 2012	<p>2010 Caribbean ACL Amendment (CFMC 2011a)</p> <ol style="list-style-type: none"> 1) Revised management reference points (maximum sustainable yield, optimum yield, OFL, ABC) for snapper, grouper, parrotfish, and queen conch 2) Established ACLs and AMs for queen conch and snapper, groupers, and parrotfish. 3) Prohibited the harvest of midnight, blue, and rainbow parrotfish 4) Established framework measures for the Queen Conch and the Reef Fish FMPs 5) Established recreational bag limits for snappers, groupers, and parrotfishes. 6) Provided guidelines for triggering AMs and applying those AMs 	<p>Prevent overfishing while maintaining catch levels consistent with achieving optimum yield (OY).</p> <p>Establish management measures that are consistent with the biological needs of a resource while achieving optimum yield as determined by environmental, economic, and social considerations. This implies restricting harvest if biological and environmental needs are not met or allowing increased harvest if economic benefits are reduced because of overly restrictive regulation. Participation, bag, size, seasonal, or areal limits should be consistent with allowable harvest limits, both in total and by sector.</p>
Effective date January 2012	<p>2011 Caribbean ACL Amendment (2011b)</p> <ol style="list-style-type: none"> 1) Revised management reference points and status determination criteria for selected reef fish, spiny lobster, and aquarium trade species. 2) Established ACLs and AMs for spiny lobster, other managed reef fish species, and coral resources (including aquarium trade species) that were not determined to be undergoing overfishing. 3) Allocated ACLs among island management areas 4) Established framework procedures for the Spiny Lobster FMP and modified framework measures for the Coral FMP 5) Established recreational bag limits for reef fish and spiny lobster 	<p>Establish Island-specific ACLs and AMs in response to harvesting activities on a single island (Puerto Rico, St. Croix) or island group (St. Thomas/St. John) while minimizing the effects of fishing activities on the other islands or island groups;</p> <p>Establish separate ACLs for each of the commercial and recreational sectors for the Puerto Rico EEZ management area, because landings data are available for both the commercial and recreational sectors</p> <p>Species-specific management measures set to consider the ecological importance of the species, species that are currently managed under a partial harvest prohibition, or species for which harvest patterns are unknown.</p>

9. Determine the magnitude and significance of cumulative effects.

The action proposed in this amendment would simplify the process of adjusting the ACLs, if needed, in the future, rather than doing it on a case by case basis or through a lengthier full plan amendment. This action would affect all fisheries conducted in the U.S. Caribbean EEZ, although it is not expected to substantially modify fishing activities. The action may have beneficial impacts such as more responsive management sensitive to the status of the targeted population and increased revenue from healthy fisheries. However, the latter may be adverse as well, if a change in status results in a reduction in allowable harvest. Overall, modifying the buffer reduction applied to derive the ACL based on the overfishing status is not expected to cause or contribute direct or indirect significant effects on the biological, physical, socio-economic, and administrative environments. This is because changes in the ACL for most of the FMUs that experience changes in overfishing status, if any, would only be 5% of what is currently allowed. Also, these changes would only be effective if the overfishing status of a unit changes in a particular year. Based on the history of landings and analyses provided in this document, changes in overfishing status are expected to be infrequent. These are not expected to be significant and would not add additional cumulative effects.

Sub-alternatives are also provided to allow for exemptions to the control rule that would leave in place current buffer reductions applied to FMUs considered to play an essential ecological role within the coral reef community, FMUs for which the Council's SSC has set a specific level of ABC, or for other reasons deemed appropriate by the Council. Exempting parrotfish, angelfish, surgeonfish, and/or aquarium trade species from the application of the control rule would not add any additional cumulative effects because it would support current management measures for those units at more conservative harvest levels. Chapter 4 of this document discusses the magnitude and significance of the proposed action and alternatives on Council managed resources. Information in the CEA will be updated when the Council selects preferred alternatives.

Other management measures taken in the past such as the establishment of seasonal closures, recreational bag limits, AMs, and ACLs (measures directly related to this proposed action), in combination with the action proposed in this comprehensive amendment, are intended to contribute to the prevention or substantial reduction in the risk of overfishing. These are expected to have positive long-term biological benefits, although short-term economic and social negative effects may occur in those cases where current harvest is reduced due to changes in overfishing status. An indirect effect expected from this action could be an increase in the harvest of other species as fishermen could decide to mitigate for the loss of fishing opportunities for those species that experience a decrease in the ACL because of changes in the overfishing status of a unit. However, U.S. Caribbean fishers usually fish for other species (e.g., reef fish, lobster, pelagics), these species also have harvest limits, and thus additional impacts on these

species are not expected to be significant. Other activities conducted in the EEZ, such as research activities, are not expected to add to the cumulative effects from this action.

10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.

Information regarding the modification or addition of alternatives will be completed once preferred alternatives are chosen.

11. Monitor the cumulative effects of the selected alternative and adapt management.

The effects of the proposed action will be monitored through collection of fisheries data by NMFS and the Puerto Rico and USVI governments, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. In the USVI, commercial landings data are collected by the Department of Planning and Natural Resources. Recreational landings data for the queen conch is not currently collected in the USVI. In Puerto Rico, commercial and recreational landings data are collected by the Department of Natural and Environmental Resources.

Chapter 5. List of Preparers

Table 5-1. List of Interdisciplinary Plan Team (IPT) Members

Name	Agency	Title
María del Mar López	NMFS/SF	IPT Lead / Fishery Biologist
Bill Arnold	NMFS/SF	Caribbean Branch Chief / Fishery Biologist
Graciela García-Moliner	CFMC	Fishery Biologist
Jose A. Rivera	NMFS/HC	EFH Specialist
Kate Quigley	CFMC	Economist
Christina Package	NMFS/SF	Anthropologist
Denise Johnson	NMFS/SF	Economist
Andrew Herndon	NMFS/PR	Fishery Biologist
Michael Larkin	NMFS/SF	Data Analyst
Meaghan Bryan	NMFS/SEFSC	Fishery Biologist
Shepherd Grimes	NOAA/GC	Attorney
Scott Sandorf	NMFS/SF	Technical Writer
David Keys	NMFS/SER	Regional NEPA Coordinator
Brent Stoffle	NMFS/SEFSC	Anthropologist
Lynn Rios	NOAA/OLE	Enforcement Officer

NMFS = National Marine Fisheries Service, CFMC = Caribbean Fishery Management Council, SF = Sustainable Fisheries Division, PR = Protected Resources Division, SERO = Southeast Regional Office, SER = Southeast Region, HC = Habitat Conservation Division, GC = General Counsel, SEFSC = Southeast Fisheries Science Center, OLE= Office of Law Enforcement

Chapter 6. List of Agencies, Organizations and Persons Consulted

Responsible Agencies

Caribbean Fishery Management Council
270 Muñoz Rivera Ave., Suite 401
San Juan, Puerto Rico 00918-1903
(787) 766-5926 (Telephone)
(787) 766-6239 (Fax)
<http://www.caribbeanfmc.com/>

National Marine Fisheries Service (NMFS),
Southeast Region 263 13th Avenue South St.
Petersburg, Florida 33701
(727) 824-5301 (Telephone)
(727) 824-5320 (Fax)
<http://sero.nmfs.noaa.gov/>

List of Agencies, Organizations, and Persons Consulted

Department of Commerce Office of General Counsel
National Marine Fisheries Service Office of General Counsel
National Marine Fisheries Service Office of General Counsel Southeast Region
National Marine Fisheries Service Southeast Regional Office
National Marine Fisheries Service Southeast Fisheries Science Center
National Marine Fisheries Service Silver Spring Office
National Marine Fisheries Service Office of Law Enforcement Southeast Division
United States Coast Guard
United States Department of the Interior
U.S. Virgin Islands Department of Planning and Natural Resources
Puerto Rico Department of Natural and Environmental Resources
Puerto Rico Junta de Calidad Ambiental (Puerto Rico Environmental Quality Board)

Chapter 7. References

Adams, A. 1996. Recreational Fishery Assessment Project: 1 October 1991 to 30 September 1995. Final report to the U.S. Fish and Wildlife Service Sportfish Restoration Program. F-8. Division of Fish and Wildlife, Department of Planning and Natural Resources, Government of the U.S. Virgin Islands. Unpubl. MS. 50pp.

Anderes Alvarez, B.A. and I. Uchida. 1994. Study of the Hawksbill turtle (*Eretmochelys imbricata*) stomach content in Cuban waters. *In: Study of the Hawksbill turtle in Cuba* (I), Ministry of Fishing Industry, Cuba.

Bak, R.P.M., J.J.W.M. Brouns, and F.M.L. Hayes. 1977. Regeneration and aspects of spatial competition in the scleractinian corals *Agaricia agaricites* and *Montastrea annularis*. Proceedings of the 3rd International Coral Reef Symposium, Miami, pp 143-148.

Barnette, M.C. 2001. A review of the fishing gear utilized within the Southeast Region and their potential impacts on essential fish habitat. NOAA Technical Memorandum NMFS-SEFSC-449.

Baums, I.B, Hughes C.R, and M.E. Hellberg. 2005. Mendelian microsatellite loci for the Caribbean coral *Acropora palmata*. *Marine Ecology Progress Series* 288: 115-127.

Bjorndal, K.A. 1980. Nutrition and grazing behavior of the green sea turtle, *Chelonia mydas*. *Marine Biology*. 56:147.

Bjorndal, K.A. 1997. Foraging ecology and nutrition of sea turtles. *In: Lutz, P.L. and J.A. Musick* (eds.), *The Biology of Sea Turtles*. CRC Press, Boca Raton, Florida.

Bolten, A.B. and G.H., Balazs. 1995. Biology of the early pelagic stage – the “lost year.” *In: In: Bjorndal, K.A. (ed.), Biology and Conservation of Sea Turtles*, Revised edition. Smithsonian Institution Press, Washington, D.C., 579.

Brongersma, L.D. 1972. European Atlantic Turtles. *Zool. Verhand. Leiden*, 121:318

Burke, V.J., E.A. Standora, and S.J. Morreale. 1993. Diet of juvenile Kemp’s ridley and loggerhead sea turtles from Long Island, New York. *Copeia*, 1993, 1176.

Carr, A. 1986. Rips, FADS, and little loggerheads. *BioScience*, 36:92.

Carr, A. 1987. New perspectives on the pelagic stage of sea turtle development. *Conservation Biology*, 1:103.

Catanzaro, D., Rogers, C, Hillis-Starr, Z., Nemeth, R., and M. Taylor. 2002. Status of Coral Reefs in the U.S. Virgin Islands. Pages 131-142. In: The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2002. National Oceanic and Atmospheric Administration/National Ocean Service/National Centers for Coastal Ocean Science, Silver Spring, MD. 265 pp.

CFMC. 1998. Essential fish habitat (EFH) generic amendment to the fishery management plans of the U.S. Caribbean including a draft environmental assessment. Caribbean Fishery Management Council, San Juan, Puerto Rico. 169 pp + Appendices.

CFMC. 2004. Final environmental impact statement for the generic essential fish habitat amendment to: Spiny lobster fishery management plan (FMP), Queen conch FMP, Reef Fish FMP, and Coral FMP for the U.S. Caribbean, Vols. I and II. Caribbean Fishery Management Council, San Juan, Puerto Rico.

CFMC. 2005. Comprehensive Amendment to the Fishery Management Plans (FMPs) of the U.S. Caribbean to Address Required Provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Amendment 1 to the Queen Conch FMP). Caribbean Fishery Management Council, San Juan, Puerto Rico. 533 pp + Appendices.

CFMC. 2011a. Amendment 2 to the Fishery Management Plan for the Queen Conch Fishery of Puerto Rico and the U.S. Virgin Islands and Amendment 5 to the Reef Fish Fishery Management Plan of Puerto Rico and the U.S. Virgin Islands. Caribbean Fishery Management Council, San Juan, Puerto Rico. September 22, 2011. 523 pp + Appendices. Available at: http://sero.nmfs.noaa.gov/sf/pdfs/2010_Caribbean_ACL_Amendment_FEIS_092011.pdf.

CFMC. 2011b. Comprehensive Annual Catch Limit (ACL) Amendment for the Fishery Management Plans of the U.S. Caribbean. Caribbean Fishery Management Council, San Juan, Puerto Rico. October 25, 2011. 407 pp. Available at: http://sero.nmfs.noaa.gov/sf/pdfs/2011_ACL_Amendment_FEIS_102511.pdf.

CFMC. 2011c. Five -Year review of Essential Fish Habitat in the U.S. Caribbean. Vols. 1,2. Caribbean Fishery Management Council, San Juan, Puerto Rico.

CFMC. 2013a. Amendment 4 to the Fishery Management Plan for Corals and Reef Associated Plants and Invertebrates of Puerto Rico and the U.S. Virgin Islands: Seagrass Management. Including Final Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis. Caribbean Fishery Management Council, San Juan, Puerto Rico. May 2013. 88 pp. Available at: http://sero.nmfs.noaa.gov/sustainable_fisheries/caribbean/coral/am4/index.html

CFMC. 2013b. Regulatory 2 to the Fishery Management Plan for the Queen Conch Resources of Puerto Rico and the U.S. Virgin Islands: Compatibility of Trip and Bag Limits in the Management Area of St. Croix, U.S. Virgin Islands. Including Final Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis. Caribbean Fishery Management Council, San Juan, Puerto Rico. August 2013. 133 pp. Available at: http://sero.nmfs.noaa.gov/sustainable_fisheries/caribbean/conch/index.html.

CFMC. 2013c. Regulatory Amendment 4 to the Fishery Management Plan for the Reef Fish Resources of Puerto Rico and the U.S. Virgin Islands: Parrotfish Minimum Size Limits. Including Final Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis. Caribbean Fishery Management Council, San Juan, Puerto Rico. February 2013. 188 pp. Available at: http://sero.nmfs.noaa.gov/sustainable_fisheries/caribbean/reef_fish/reg_am4/index.html.

Climate Change. 2007. Synthesis Report, Summary for Policy Makers, page 9. Approved in detail at IPCC Plenary XXVII, Valencia, Spain, 12-17 November 2007.

Council on Environmental Quality (CEQ). 1997. Considering Cumulative Effects under the National Environmental Policy Act. Washington, D.C., January.

DPNR. 2005. U.S. Virgin Islands Marine Resources and Fisheries Strategic and Comprehensive Conservation Plan. Division of Fish and Wildlife. Department of Planning and Natural Resources.

DPNR. 2012. Commercial and Recreational Fisher's Information Handbook. Division of Fish and Wildlife and Division of Environmental Enforcement, Department of Planning and Natural Resources of the U.S. Virgin Islands. July 2012. 49 pp.

Eastern Caribbean Center. 2002. Telephone Survey of Boat-Based Marine Recreational Fishing in the U.S. Virgin Islands, 2000. University of the Virgin Islands, ECC. Department of Planning and Natural Resources, Division of Fish and Wildlife, U.S. Virgin Islands. 56 pp.

EPA. 1999. EPA Region 4: Interim Policy to Identify and Address Potential Environmental Justice Areas. EPA-904-R-99-004.

Eckert, S.A., Nellis, D.W., Eckert K.L., and G.L. Kooyman. 1986. Diving patterns of two leatherback sea turtles (*Dermochelys coriacea*) during internesting intervals at Sandy Point, St. Croix, U.S. Virgin Islands. *Herpetologica*, 42:381.

Eckert, S.A., Eckert, K.L., Ponganis, P., and G.L. Kooyman. 1989. Diving patterns of two leatherback sea turtles (*Dermochelys coriacea*). *Canadian Journal of Zoology*, 67:2834.

Frick, J. 1974. Orientation and behaviour of hatchling green turtles (*Chelonia mydas*) in the sea. *Animal Behavior*, 24:849.

Friedlander, A. 1995. The recreational fishery for blue marlin, *Makaira nigricans* (Pisces: Istiophoridae), in the US. Virgin Islands. *Fish. Res.* 22:163-173.

Friedlander, A. and J. Contillo. 1994. Recreational billfish tournaments in the Virgin Islands, 1973 to 1990. *Proc. Gulf. Carib. Fish. Inst.* 43:279-291.

García-Moliner, G., Mateo, I., Maidment-Caseau, S., Tobias, W. J., and B. Kojis. 2002. Recreational chartered fishing activity in the U.S. Caribbean. *Proc. Gulf. Carib. Fish. Inst.* 53:307-317.

García-Sais, J.R., Castro, R., Sabater, J., and M. Carlo. 2005. Inventory and atlas of corals and coral reefs, with emphasis on deepwater coral reefs from the U.S. Caribbean EEZ (Puerto Rico and the United States Virgin Islands). Final Report submitted to the Caribbean Fishery Management Council. San Juan, PR. 215 pp.

Ghiold, J. and S.H. Smith. 1990. Bleaching and recovery of deep-water, reef-dwelling invertebrates in the Cayman Islands, BWI. *Caribbean Journal of Science*, 26:52-61.

Goenaga, C. and R. H. Boulon. 1991. The state of Puerto Rican and U.S. Virgin Island corals: an aid to managers. Special Report of the Caribbean Fishery Management Council. 64 pp.

Goreau, T.F. and J.W. Wells. 1967. The shallow-water Scleractinia of Jamaica: revised list of species and their vertical range. *Bulletin of Marine Science*, 17:442-453.

Goreau, T.F. and N.I. Goreau. 1973. Coral Reef Project-Papers in Memory of Dr. Thomas F. Goreau. *Bulletin of Marine Science*, 23:399-464.

Gordon, S. 2010. USVI Queen Conch Stock Assessment, 2008-2010. Final Report to Southeast Area Monitoring and Assessment Program – Caribbean (SEAMAP-C). Bureau of Fisheries, Division of Fish and Wildlife, Department of Planning and Natural Resources, U.S. Virgin Islands. 50 pp.

Griffith, D., Valdés-Pizzini, M., Chaparro, R., Johnson J., and J. D. Murray. 1988. Developing Marine Recreational Fishing in Puerto Rico and the U.S. Virgin Islands. Final report submitted to the National Marine Fisheries Service #NA866WC-H-06108. 102pp.

Griffith, D., Valdés-Pizzini, M., and C. García Quijano. 2007. Entangled Communities:

Socioeconomic Profiles of Fishers, their Communities, and their Responses to Marine Protective Measures in Puerto Rico. NOAA Series on U.S. Caribbean Fishing Communities. NOAA Technical Memorandum NMFS-SEFSC-556, 524 p. Agar, J. J. and B. Stoffle (editors)

Grober-Dunsmore, R., Bonito, V., and T.K. Frazer. 2006. Potential inhibitors to recovery of *Acropora palmata* populations in St. John, US Virgin Islands. Marine Ecology Progress Series 321: 123-132.

Harrould-Kolieb, E., Huelsenbeck, M. and V. Selz. 2010. Ocean acidification: the untold stories. Oceana.org. Obtained online:
[http://oceana.org/sites/default/files/reports/Ocean Acidification The Untold Stories.pdf](http://oceana.org/sites/default/files/reports/Ocean_Acidification_The_Untold_Stories.pdf).

[The] Heinz Center. 2000. Improving federal fisheries management in the Caribbean region: A summary of views presented during the Caribbean Regional Roundtable. The H. John Heinz III Center for Science, Economics, and the Environment. Obtained online at:
<http://www.heinzctr.org/publications/PDF/Caribbean.PDF>.

Hinkey, M. L., N. Quinn and R. Strickland. 1994. a survey of marine recreational services in the U.S. Virgin Islands. Final report submitted to Eastern Caribbean Center, University of the Virgin Islands PRU-T-92-001. 47pp.

Impact Assessment, Inc.(IAI), 2007. Community Profiles and Socioeconomic Evaluations of Marine Conservation Districts: St. Thomas and St. John, U.S. Virgin Islands. NOAA Series on U.S. Caribbean Fishing Communities. NOAA Technical Memorandum NMFS-SEFSC-557, 123 p. Agar, J. J. and B. Stoffle (editors).

Jaap, W.C, Lyons, W.G, Dustan, P., and H.C. Halas. 1989. Stony coral (Scleractinia and Milleporina) community structure at Bird Key Reef, Ft. Jefferson National Monument, Dry Tortugas, Florida. Florida Marine Research Publication 46.

Jennings, C. A. 1992. Survey of Non-Charter Boat Recreational Fishing in the U. S. Virgin Islands. Bull. Mar. Sci. 50(2):342-351.

Keinath, J.A. and J.A., Musick. 1993. Movements and diving behavior of a leatherback sea turtle, *Dermochelys coriacea*. *Copeia*, 1993:1010.

Kojis, B. and N. Quinn. 2012. Census of the Marine Commercial Fishers of the U.S. Virgin Islands 2011. Dept. Planning Nat. Res., U.S.V.I. Div. of Fish Wildl. St. Thomas, 129 pp.

Hughes, G.R. 1974. The sea-turtles of south-east Africa. II. The biology of the Tongaland loggerhead turtle *Caretta caretta* L. with comments on the leatherback turtle *Dermochelys*

coriacea L. and green turtle *Chelonia mydas* L. in the study region. Oceanographic Research Institute (Durban) Investigative Report. No. 36.

Lanyan, J.M., C.J. Limpus, and H., Marsh. 1989. Dugongs and turtles: grazers in the seagrass system. *In: Larkum, A.W.D, A.J., McComb and S.A., Shepard (eds.) Biology of Seagrasses.* Elsevier, Amsterdam, 610.

Lewis, J.B. 1977. Suspension feeding in Atlantic reef corals and the importance of suspended particulate matter as a food source. *Proceedings of the 3rd International Coral Reef Symposium.* pp. 405-408.

Limpus, C.J. and N., Nichols. 1988. The southern oscillation regulates the annual numbers of green turtles (*Chelonia mydas*) breeding around northern Australia. *Australian Journal of Wildlife Research*, 15:157.

Lutz, P.L. and J.A. Musick (eds.). 1997. *The Biology of Sea Turtles.* CRC Press, Boca Raton, Florida.

Lutz, P.L., J.A. Musick, and J. Wyneken. 2002. *The Biology of Sea Turtles, Volume II.* CRC Press, Boca Raton, Florida.

Mateo, I. 2000. Recreational Fisheries Assessment Project: 1 October 1995 to 30 September 2000. Final report to the U.S. Fish and Wildlife Service Sportfish Restoration Program. F-8. Division of Fish and Wildlife, Department of Planning and Natural Resources, Government of the U.S. Virgin Islands. Unpubl. MS 52 pp.

Matos-Caraaballo, D. and J. J. Agar. 2011. Census of Active Commercial Fishermen in Puerto Rico: 2008. *Marine Fisheries Review*, 73 (1): 13-27.

Mayor P.A., Rogers C.S., and Z.M Hillis-Starr. 2006. Distribution and abundance of elkhorn coral, *Acropora palmata*, and prevalence of white-band disease at Buck Island Reef National Monument, St. Croix, US Virgin Islands. *Coral Reefs* 25(2): 239-242.

McCarthy, K. and T. Gedamke. 2008. United States virgin Island Fisheries Description and Available Data. Draft Report.

Messineo, J. and K. R. Uwate. 2004. 2003 Opinion Survey of U.S. Virgin Island Recreational Fishing Club Members. Bureau of Fisheries, Division of Fish and Wildlife, Department of Planning and Natural Resources, U.S. Virgin Islands. 14 pp.

Meylan, A. 1988. Spongivory in hawksbill turtles: a diet of glass. *Science* 239:393-395.

Meylan, A.B. and M. Donnelly. 1999. Status justification for listing the hawksbill turtle (*Eretmochelys imbricata*) as critically endangered on the 1996 IUCN Red List of Threatened Animals. *Chelonian Conservation and Biology* 3(2): 200-204.

Meyland, A. 1984. Feeding Ecology of the Hawksbill turtle (*Eretmochelys imbricata*): Spongivory as a Feeding Niche in the Coral Reef Community. Dissertation, University of Florida, Gainesville, FL.

Morelock, J.N., Capella, J., García, J.R., and M. Barreto. 2001. Puerto Rico-seas at the millenium. *Carribbean Journal of Science*. Obtained online at: <http://rmocfis.uprm.edu/~morelock/pdfdoc/morlok2.pdf>

Mortimer, J.A. 1982. Feeding ecology of sea turtles. *In*: Bjorndal, K.A. (ed.), *Biology and Conservation of Sea Turtles*. Smithsonian Institute Press, Washington, D.C.

Mortimer, J.A. 1981. The feeding ecology of the West Caribbean green turtle (*Chelonia mydas*) in Nicaragua. *Biotropica*, 13:49.

NMFS. 2005. Endangered Species Act – Section 7 Consultation on [the] Draft Amendment to the Fishery Management Plans (FMPs) of the U.S. Caribbean to Address Required Provisions of the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act. Biological Opinion, May 19. 102 pp.

NMFS. 2011a. Record of Decision. Final Environmental Impact Statement for Amendment 2 to the Fishery Management Plan for the Queen conch fishery of Puerto Rico and the U.S. Virgin Islands and Amendment 5 to Fishery Management Plan for the Reef fish Fishery of Puerto Rico and the U.S. Virgin Islands (2010 Caribbean ACL Amendment). National Marine Fisheries Service, Southeast Region, St. Petersburg, Florida. December 2011.

NMFS. 2011b. Record of Decision for the Final Environmental Impact Statement for the Comprehensive ACL Amendment to the Fishery Management Plans of the U.S. Caribbean (2011 Caribbean ACL Amendment).

NMFS. 2011c. Annual Report to Congress on the Status of U.S. Fisheries-2010, Appendix 1. Report Format and Description of Methodology for Determining Overfishing and Overfished Status. U.S. Department of Congress. NOAA, Natl., Mar. Fish. Serv., Silver Spring, MD http://www.nmfs.noaa.gov/sfa/statusoffisheries/2010/2010_Appendices_1and2.pdf.

NMFS. 2011d. Endangered Species Act – Section 7 Consultation on the Continued Authorization of Reef Fish Fishing Managed under the Reef Fish Fishery Management Plan

(FMP) of Puerto Rico and the U.S. Virgin Islands (CRFFMP). Biological Opinion, October 4. 260 pp.

NMFS. 2011e. Endangered Species Act – Section 7 Consultation Continued Authorization of Spiny Lobster Fishing Managed under the Spiny Lobster Fishery Management Plan of Puerto Rico and the U.S. Virgin Islands (SLFMP). Biological Opinion, December 12. 182 pp.

NMFS. 2012. Status of Stocks 2011. Annual Report to Congress on the Status of U.S. Fisheries. U.S. Department of Congress. National Oceanic and Atmospheric Administration. http://www.nmfs.noaa.gov/stories/2012/05/docs/status_of_stocks_2011_report.pdf

NMFS. 2012. Annual Report to Congress on the Status of U.S. Fisheries-2011, U.S. Department of Commerce, NOAA, Natl., Mar. Fish. Serv., Silver Spring, MD, 20 pp.

NMFS. 2013a. Annual Report to Congress on the Status of U.S. Fisheries-2012, U.S. Department of Congress. NOAA, Natl., Mar. Fish. Serv., Silver Spring, MD http://www.nmfs.noaa.gov/stories/2013/05/docs/2012_sos_rtc.pdf

NMFS. 2013b. Annual Report to Congress on the Status of U.S. Fisheries-2012, Appendix 1. Report Format and Description of Methodology for Determining Overfishing and Overfished Status. U.S. Department of Congress. NOAA, Natl., Mar. Fish. Serv., Silver Spring, MD http://www.nmfs.noaa.gov/sfa/statusoffisheries/2012/RTC/2012_Appendix1.pdf

NMFS. 2013c. Annual Report to Congress on the Status of U.S. Fisheries-2012, Appendix 3. Status Determination Criteria used in the Most Recent Status Determination. U.S. Department of Congress. NOAA, Natl., Mar. Fish. Serv., Silver Spring, MD http://www.nmfs.noaa.gov/sfa/statusoffisheries/2012/RTC/2012_Appendix3.pdf.

Olcott, P.G. 1999. Puerto Rico and the U.S. Virgin Islands. In: Ground Water Atlas of the United States, Alaska, Hawaii, Puerto Rico and the U.S. Virgin Islands. USGS Rep. HA 730-N.

Olsen, D. A. and R. S. Wood. 1983. The marine resource base for marine recreational fisheries development in the Caribbean. Proc. Gulf. Carib. Fish. Inst. 35:152-160.

Paredes, R.P. 1969. Introducción al Estudio Biológico de *Chelonia mydas agassizi* en el Perfil de Pisco, Masters thesis, Universidad Nacional Federico Villareal, Lima, Perú.

Porter, J.W. 1976. Autotrophy, heterotrophy, and resource partitioning in Caribbean reef-building corals. The American Naturalist 110: 731-742.

Restrepo, V. R., Thompson, G. G., Mace, P.M., Gabriel, W. L., Low, L. L., MacCall, A. D., Methot, R. D., Powers, J. E., Taylor, B. L., Wade, P. R., and J.F. Witzig. 1998. Technical

guidance on the use of precautionary approaches to implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act. NOAA (US) Technical Memorandum NMFS-F/SPO-31.54 pp.

Rylaarsdam, K.W. 1983. Life histories and abundance patterns of colonial corals on Jamaican reefs. *Marine Ecology Progress Series* 13: 249-260.

Sammarco, P.W. 1980. *Diadema* and its relationship to coral spat mortality: grazing, competition, and biological disturbance. *Journal of Experimental Marine Biology and Ecology* 45(2-3): 245-272.

Schärer, M., Nemeth, M., Valdivia, A, Miller, M, Williams, D, and C. Diez. 2009. Elkhorn coral distribution and condition throughout the Puerto Rican Archipelago. *Proceedings of the 11th International Coral Reef Symposium* pp. 815-819.

Soong K and Lang JC. 1992. Reproductive integration in reef corals. *Biological Bulletin* 183(3): 418-431.

Standora, E.A., J.R., Spotila, J.A., Keinath, and C.R. Shoop. 1984. Body temperatures, diving cycles, and movements of a subadult leatherback turtle, *Dermochelys coriacea*. *Herpetologica*, 40:169.

Stoffle, B., Contillo, J., Grace, C., and D. Snodgrass. 2011. The Socio-economic Importance of Fishing in St. Thomas, USVI: An Examination of Fishing Community Designation. NOAA Technical Memorandum NMFS-SEFSC-623, 43 p.

Szmant, A.M. 1986. Reproductive ecology of reef corals. *Coral Reefs* 5: 43-54.

Szmant, A.M. and M.W. Miller. 2006. Settlement preferences and post-settlement mortality of laboratory cultured and settled larvae of the Caribbean hermatypic corals *Montastraea faveolata* and *Acropora palmata* in the Florida Keys, USA. *Proceedings of the 10th International Coral Reef Symposium*.

Thayer, G.W., K.A., Bjorndal, J.C., Ogden, S.L., Williams, and J.C., Zieman. 1984. Role of large herbivores in seagrass communities. *Estuaries*, 7:351.

Tobias, W. and K. Dupigny. 2009. Survey of U.S. Virgin Islands Recreational Fishing Boats That Target Billfish and Other Pelagic Species. Final Report Billfish-2005-16. Division of Fish and Wildlife, Department of Planning and Natural Resources, Government of the U.S. Virgin Islands. 86pp.

Valdés-Pizzini, M., Agar, J. J., Kitner, K., García-Quijano, C., Tust, M., and F. Forrestal. 2010. Cruzan Fisheries: A rapid assessment of the historical, social, cultural and economic processes that shaped coastal communities' dependence and engagement in fishing in the island of St. Croix, U.S. Virgin Islands. NOAA Series on U.S. Caribbean Fishing Communities. NOAA Technical Memorandum NMFS-SEFSC-597, 144 p.

Van Dam, R. and C. Diéz. 1998. Home range of immature hawksbill turtles (*Eretmochelys imbricata*) at two Caribbean islands. *Journal of Experimental Marine Biology and Ecology*, 220(1):15-24.

Walker, T.A. 1994. Post-hatchling dispersal of sea turtles. p. 79. *In*: Proceedings of the Australian Marine Turtle Conservation Workshop, Queensland Australia.

WPFMC. 2009. Fishery Ecosystem Plan for the American Samoa Archipelago Western Pacific Regional Fishery Management Council. 220 pp.

Williams, E.H. and L. Bunkley-Williams. 1990. The world-wide coral reef bleaching cycle and related sources of coral mortality. *Atoll Research Bulletin*, 335:1-71.

Witzell, W.N. 2002. Immature Atlantic loggerhead turtles (*Caretta caretta*): suggested changes to the life history model. *Herpetological Review* 33(4):266-269.

Appendices

Appendix A. Other Applicable Law

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.) provides the authority for fishery management in federal waters of the exclusive economic zone. However, fishery management decision-making is also affected by a number of other federal statutes designed to protect the biological and human components of U.S. fisheries, as well as the ecosystems that support those fisheries. Major laws affecting federal fishery management decision-making are summarized below.

Administrative Procedures Act

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II), which establishes a “notice and comment” procedure to enable public participation in the rulemaking process. Under the APA, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it takes effect.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. 1451 et seq.) encourages state and federal cooperation in the development of plans that manage the use of natural coastal habitats, as well as the fish and wildlife those habitats support. When proposing an action determined to directly affect coastal resources managed under an approved coastal zone management program, NMFS is required to provide the relevant State agency with a determination that the proposed action is consistent with the enforceable policies of the approved program to the maximum extent practicable at least 90 days before taking final action. NMFS may presume State agency concurrence if the State agency’s response is not received within 60 days from receipt of the agency’s consistency determination and supporting information as required by 15 C.F.R. §930.41(a).

Data Quality Act

The Data Quality Act (Public Law 106-443), which took effect October 1, 2002, requires the government for the first time to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

Specifically, the Act directs the Office of Management and Budget (OMB) to issue government wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." Such guidelines have been issued, directing all federal agencies to create and issue agency-specific standards to: 1) Ensure information quality and develop a pre-dissemination review process; 2) establish administrative mechanisms allowing affected persons to seek and obtain correction of information; and 3) report periodically to OMB on the number and nature of complaints received.

Scientific information and data are key components of fishery management plans (FMPs) and amendments and the use of best available information is the second national standard under the Magnuson-Stevens Act. To be consistent with the Act, FMPs and amendments must be based on the best information available. They should also properly reference all supporting materials and data, and be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data will also undergo quality control prior to being used by the agency and a pre-dissemination review.

Endangered Species Act

The Endangered Species Act (ESA) of 1973 (16 U.S.C. Section 1531 et seq.) requires federal agencies to ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or the habitat designated as critical to their survival and recovery. The ESA requires NMFS to consult with the appropriate administrative agency (itself for most marine species, and the U.S. Fish and Wildlife Service for all remaining species) when proposing an action that may affect threatened or endangered species or adversely modify critical habitat. Consultations are necessary to determine the potential impacts of the proposed action. They are concluded informally when proposed actions may affect but are "not likely to adversely affect" threatened or endangered species or designated critical habitat. Formal consultations, resulting in a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" threatened or endangered species or adversely modify designated critical habitat.

NMFS has completed ESA Section 7 consultations on the continued authorization of the Queen Conch, Spiny Lobster, Corals and Reef Associated Plants and Invertebrate, and Reef Fish fisheries under their respective FMPs. In 2011, NMFS completed separate biological opinions evaluating the impacts of the continue authorization of the reef fish (NMFS 2011d) and spiny lobster fisheries (NMFS 2011e) on ESA-listed species. The reef fish biological opinion stated the fishery was not likely to adversely affect loggerhead sea turtles, sea turtle critical habitat, or marine mammals (see NMFS 2011d for discussion on these species and entities). However, the

opinion did state that the reef fish fishery would adversely affect green, hawksbill, and leatherback sea turtles and *Acropora* coral but would not jeopardize their continued existence. The opinion also stated the reef fish fishery would adversely affect *Acropora* critical habitat but would not destroy or adversely modify it. An incidental take statement was issued for green, hawksbill, and leatherback sea turtles, as well as *Acropora* corals. Reasonable and prudent measures to minimize the impact of these incidental takes were specified, along with terms and conditions to implement them.

The spiny lobster biological opinion stated the fishery was not likely to adversely affect elkhorn coral, loggerhead sea turtles, sea turtle critical habitat, or marine mammals (see NMFS 2011e, for discussion on these species and entities). However, the opinion did state that the spiny lobster fishery would adversely affect green, hawksbill, and leatherback sea turtles and staghorn coral but would not jeopardize their continued existence. The opinion also stated the spiny lobster fishery would adversely affect *Acropora* critical habitat but would not destroy or adversely modify it. An incidental take statement was issued for green, hawksbill, and leatherback sea turtles, as well as staghorn coral. Reasonable and prudent measures to minimize the impact of these incidental takes were specified, along with terms and conditions to implement them.

NMFS met the ESA Section 7 consultation requirements to evaluate the potential impacts to listed species from the continued authorization of the Corals and Reef Associated Plants and Invertebrate fisheries via informal consultations. In a consultation memorandum dated February 8, 2013, NMFS concurred with the determination that the continued authorization of the fishery was not likely to adversely affect any listed species or critical habitat. That determination was based primarily on the fact that the vast majority of the fishery does not operate in federal waters and because the fishery is highly selective and fishers can easily avoid listed species. The memorandum also concurred with the determination that the essential feature of *Acropora* critical habitat (i.e., consolidated hardbottom or dead coral skeleton that is free from fleshy macroalgae cover and sediment cover, occurring in water depths from the mean high water line to 30 meters (98 feet)), was not likely to be adversely affected by the continued authorization of fishery. The memorandum agreed with the determination that coral reef fishers would not cause consolidated hardbottom to become unconsolidated and would not cause the growth of macroalgae or sedimentation; therefore, any adverse were unlikely to occur and are discountable.

NMFS completed an informal consultation on the continued authorization of the queen conch fishery on November 18, 2010. The memorandum concurred that the previous not likely to adversely affect determinations for sea turtles and marine mammals in 2005 biological opinion on all Caribbean fisheries remained valid (NMFS 2005). The memorandum also determined the fishery was not likely to adversely affect *Acropora* or their critical habitat. It stated 1) the queen conch fishery in the EEZ is very small; 2) queen conch are most common in seagrass areas

where *Acropora* do not occur and *Acropora* critical habitat is not designated; and 3) the hand harvest of queen conch is highly selective. For these reasons the memorandum determined that any adverse effects to *Acropora* and their critical habitat from the collection of queen conch were extremely unlikely to occur and discountable. However, in a June 14, 2013, memorandum, NMFS reevaluated information regarding the occurrence of queen conch on hardbottom habitat and their potential role in mediating macroalgae growth on *Acropora* critical habitat. The memorandum determined that queen conch densities are low in the U.S. Caribbean; they prefer habitats that are not *Acropora* critical habitat; and prefer to eat the non-“fleshy macroalgae”, which is a significant threat to *Acropora* critical habitat. The memorandum concluded that because of these factors the harvest of queen conch will have an insignificant effect on *Acropora* critical habitat and request concurrence with that determination. NMFS is currently reviewing this determination and anticipates completion of the consultation prior to the publication of the final rule.

Marine Mammal Protection Act (MMPA)

The MMPA established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas. It also prohibits the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NMFS) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea otters, polar bears, manatees, and dugongs.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. The MMPA requires a commercial fishery to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals. Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities. To legally fish in a Category I and/or II fishery, a fisherman must obtain a marine mammal authorization certificate by registering with the Marine Mammal Authorization Program (50 CFR 229.4) and accommodate an observer if requested (50 CFR 229.7(c)) and they must comply with any applicable take reduction plans.

NMFS has determined that fishing activities conducted under this amendment will have no adverse impact on marine mammals. According to the List of Fisheries for 2012 published by NMFS, all gear (dive, hand/mechanical collection fisheries) used in the reef fish, queen conch, spiny lobster, and coral resources fisheries are considered Category III (76 FR 73912), meaning annual mortality and serious injury of marine mammals in these fisheries is less than or equal to one percent of the potential biological removal level.

Paperwork Reduction Act

The Paperwork Reduction Act (PRA) of 1995 (44 U.S.C. 3501 et seq.) regulates the collection of public information by federal agencies to ensure that the public is not overburdened with information requests, that the federal government's information collection procedures are efficient, and that federal agencies adhere to appropriate rules governing the confidentiality of such information. The PRA requires NMFS to obtain approval from the Office of Management and Budget before requesting most types of fishery information from the public. This action does not contain a collection-of-information requirement for purposes of the PRA.

Small Business Act

The Small Business Act of 1953, as amended, Section 8(a), 15 U.S.C. 634(b)(6), 636(j), 637(a) and (d); Public Laws 95-507 and 99-661, Section 1207; and Public Laws 100-656 and 101-37 are administered by the Small Business Administration. The objectives of the act are to foster business ownership by individuals who are both socially and economically disadvantaged; and to promote the competitive viability of such firms by providing business development assistance including, but not limited to, management and technical assistance, access to capital and other forms of financial assistance, business training and counseling, and access to sole source and limited competition federal contract opportunities, to help the firms to achieve competitive viability. Because most businesses associated with fishing are considered small businesses, NMFS, in implementing regulations, must assess how those regulations will affect small businesses.

Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Provisions

The Magnuson-Stevens Act includes EFH requirements, and as such, each existing, and any new FMPs must describe and identify EFH for the fishery, minimize to the extent practicable adverse effects on that EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of that EFH.

The areas affected by the proposed action have been identified as EFH for queen conch, spiny lobster, corals, and reef fish. As specified in the Magnuson-Stevens Act, EFH consultation is required for federal actions which may adversely affect EFH.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.) requires federal agencies to consider the environmental and social consequences of proposed major actions, as well as alternatives to those actions, and to provide this information for public consideration and comment before selecting a final course of action. This document contains an Environmental Assessment to satisfy the NEPA requirements. The Purpose and Need can be found in Section 1.4, Alternatives are found in Chapter 2, the Environmental Consequences are

found in Chapter 4, the List of Preparers is in Chapter 7, and a list of the agencies/people consulted is found in Chapter 8.

Regulatory Flexibility Act (RFA)

The purpose of the Regulatory Flexibility Act (RFA 1980, 5 U.S.C. 601 et seq.) is to ensure that federal agencies consider the economic impact of their regulatory proposals on small entities, analyze effective alternatives that minimize the economic impacts on small entities, and make their analyses available for public comment. The RFA does not seek preferential treatment for small entities, require agencies to adopt regulations that impose the least burden on small entities, or mandate exemptions for small entities. Rather, it requires agencies to examine public policy issues using an analytical process that identifies, among other things, barriers to small business competitiveness and seeks a level playing field for small entities, not an unfair advantage.

After an agency determines that the RFA applies, it must decide whether to conduct a full regulatory flexibility analysis (Initial Regulatory Flexibility Analysis (IRFA) and Final Regulatory Flexibility Analysis (FRFA)) or to certify that the proposed rule will not "have a significant economic impact on a substantial number of small entities." In order to make this determination, the agency conducts a threshold analysis, which has the following 5 parts: 1) Description of small entities regulated by the proposed action, which includes the SBA size standard(s), or those approved by the Office of Advocacy, for purposes of the analysis and size variations among these small entities; 2) descriptions and estimates of the economic impacts of compliance requirements on the small entities, which include reporting and recordkeeping burdens and variations of impacts among size groupings of small entities; 3) criteria used to determine if the economic impact is significant or not; 4) criteria used to determine if the number of small entities that experience a significant economic impact is substantial or not; and 5) descriptions of assumptions and uncertainties, including data used in the analysis. If the threshold analysis indicates that there will not be a significant economic impact on a substantial number of small entities, the agency can so certify.

Executive Orders

E.O. 12630: Takings

The Executive Order on Government Actions and Interference with Constitutionally Protected Property Rights, which became effective March 18, 1988, requires that each federal agency prepare a Takings Implication Assessment for any of its administrative, regulatory, and legislative policies and actions that affect, or may affect, the use of any real or personal property. Clearance of a regulatory action must include a takings statement and, if appropriate, a Takings

Implication Assessment. The NOAA Office of General Counsel will determine whether a Takings Implication Assessment is necessary for this amendment.

E.O. 12866: Regulatory Planning and Review

Executive Order 12866, signed in 1993, requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, NMFS prepares a Regulatory Impact Review (RIR) for all fishery regulatory actions that either implement a new fishery management plan or significantly amend an existing plan. RIRs provide a comprehensive analysis of the costs and benefits to society associated with proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. The reviews also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action" under the criteria provided in E.O. 12866 and whether proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Act analysis.

E.O. 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations

This Executive Order mandates that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions. See Section 3.4.3 for Environmental Justice considerations as they relate to this regulatory amendment.

E.O. 12962: Recreational Fisheries

This Executive Order requires federal agencies, in cooperation with States and Tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and recreational fisheries, and documenting those effects.

Additionally, it establishes a seven-member National Recreational Fisheries Coordination Council responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies,

and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The Council also is responsible for developing, in cooperation with federal agencies, States and Tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the Order requires NMFS and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

E.O. 13089: Coral Reef Protection

The Executive Order on Coral Reef Protection (June 11, 1998) requires federal agencies whose actions may affect U.S. coral reef ecosystems to identify those actions, utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and, to the extent permitted by law, ensure that actions they authorize, fund or carry out not degrade the condition of that ecosystem. By definition, a U.S. coral reef ecosystem means those species, habitats, and other national resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., federal, state, territorial, or commonwealth waters).

The action in this amendment will have no direct impacts on coral reefs. Regulations are already in place to limit or reduce impacts to coral reef habitat in the U.S. Caribbean EEZ. In addition, NMFS approved and implemented the 2011 Annual Catch Limit (ACL) Amendment, which established ACLs and accountability measures for species within the Corals and Reef Associated Plants and Invertebrates FMP. These actions will prevent overfishing of coral reef resources, which contain species that play important roles on coral reef ecosystems of the U.S. Caribbean.

E.O. 13132: Federalism

The Executive Order on Federalism requires agencies, when formulating and implementing policies, to be guided by the fundamental Federalism principles. The Order serves to guarantee the division of governmental responsibilities between the national government and the states that was intended by the framers of the Constitution. Federalism is rooted in the belief that issues not national in scope or significance are most appropriately addressed by the level of government closest to the people. This Order is relevant to FMPs and amendments given the overlapping authorities of NMFS, the states, and local authorities in managing coastal resources, including fisheries, and the need for a clear definition of responsibilities. It is important to recognize those components of the ecosystem over which fishery managers have no direct control and to develop strategies to address them in conjunction with appropriate international, State, Tribal, and local entities. No Federalism issues have been identified relative to the action proposed in this regulatory amendment. Therefore, consultation with state officials under Executive Order 13132 is not necessary.

E.O. 13112: Invasive Species

This Executive Order requires agencies to use their authority to prevent introduction of invasive species, respond to and control invasions in a cost effective and environmentally sound manner, and to provide for restoration of native species and habitat conditions in ecosystems that have been invaded. Further, agencies shall not authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere unless a determination is made that the benefits of such actions clearly outweigh the potential harm; and that all feasible and prudent measures to minimize the risk of harm will be taken in conjunction with the actions. The actions undertaken in this amendment will not introduce, authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere.

E.O. 13158: Marine Protected Areas (MPA)

Executive Order 13158 (May 26, 2000) requires federal agencies to consider whether their proposed action(s) will affect any area of the marine environment that has been reserved by Federal, State, territorial, Tribal, or local laws or regulations to provide lasting protection for part or all of the natural or cultural resource within the protected area. This action is not expected to affect any marine protected areas in federal waters of the U.S. Caribbean.

Appendix B. Summary of Regulations in Federal, U.S. Virgin Islands, and Puerto Rico Waters.

Revised 4.24.2014 – NMFS/Sustainable Fisheries/Caribbean Branch. This is a summary of current regulations for informational purposes only. For current official regulations go to: http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

QUEEN CONCH		
	Closed	Open
Federal (only applies to Lang Bank, STX. Season closes when STX territorial limit is reached)	Jun 1 – Oct 31	Nov 1 – May 31
Puerto Rico	Aug 1 – Oct 31	Nov 1 – Jul 31
USVI (50,000 lbs STX & 50,000 lbs STT/STJ) Season closes when limit is reached	Jun 1 – Oct 31	Nov 1 – May 31
SNAPPERS		
Snapper Unit 1: (1) silk, (2) black, (3) blackfin, (4) vermillion, (5) wenchman*		
	Closed	Open
Federal	Oct 1 – Dec 31	Jan 1 – Sept 30
Puerto Rico (only applies to silk and blackfin)	Oct 1 – Dec 31	Jan 1 – Sept 30
USVI (only applies to STT/STJ)	Oct 1 – Dec 31	Jan 1 – Sept 30
*Wenchman was transferred from Snapper Unit 2 to Snapper Unit 1 (Effective January 30, 2012. Seasonal closure does not apply to wenchman).		
Snapper Unit 2: (1) queen, (2) cardinal ^{new}		
Federal	No restrictions	
Puerto Rico		
USVI		
*Cardinal was added to Snapper Unit 2 (Effective January 30, 2012)		
Snapper Unit 3: (1) mutton, (2) lane, (3) gray, (4) dog, (5) schoolmaster, (6) mahogany		
	Closed	Open
Federal (only applies to mutton and lane)	Apr 1 – Jun 30	July 1 – Mar 31
Puerto Rico (only applies to mutton)	Apr 1 – May 31	June 1 – Mar 31
USVI (only applies to mutton and lane)	Apr 1 – Jun 30	July 1 – Mar 31
Snapper Unit 4: (1) yellowtail snapper		
No seasonal closures. Size limits apply year-round		
Federal	12 inches (in) Total Length (TL)	
Puerto Rico	10.5 in Fork Length (FL)	
USVI	No size limit	
PARROTFISH		
Federal	<ul style="list-style-type: none"> No harvest of midnight, blue, and rainbow parrotfish. 8 in (FL) min. size for redband parrotfish <u>only applies to STX</u> 9 in (FL) min. size all other parrotfish (princess, queen, striped, redtail, stoplight, redfin) <u>only applies to STX</u> 	
Puerto Rico	No restrictions	
USVI	No harvest of midnight, blue, and rainbow parrotfish ^(unofficial)	

GROUPERS		
Grouper Unit 1: (1) Nassau grouper		
Federal	PROHIBITED SPECIES	
Puerto Rico		
USVI		
Grouper Unit 2: (1) goliath grouper		
Federal	PROHIBITED SPECIES	
Puerto Rico		
USVI		
Grouper Unit 3: (1) red hind, (2) coney, (3) rock hind, (4) graysby		
	Closed	Open
Federal (only applies to red hind in Red Hind Spawning Aggregation Areas: Lang Bank, Tourmaline, Abrir La Sierra, Bajo de Sico*)	Dec 1 – Last day Feb	Mar 1 – Nov 30
Puerto Rico (only applies to red hind)	Dec 1 – Last day Feb	Mar 1 – Nov 30
USVI	-----	-----
*Creole fish was removed from Grouper Unit 3 and from federal management (Effective January 30, 2012).		
Grouper Unit 4*: (1) yellowfin, (2) red, (3) tiger, (4) black		
	Closed	Open
Federal	Feb 1 – Apr 30	May 1 – Jan 31
Puerto Rico (only applies to yellowfin)	Feb 1 – Apr 30	May 1 – Jan 31
USVI	Feb 1 – Apr 30	May 1 – Jan 31
*Yellowedge and misty groupers were transferred from Grouper Unit 4 to Grouper Unit 5. Black grouper was added into Grouper Unit 4 (Effective January 30, 2012).		
Grouper Unit 5*: (1) yellowedge, (2) misty		
	Closed	Open
Federal (only applies to yellowedge)	Feb 1 – Apr 30	May 1 – Jan 31
Puerto Rico	No restrictions	
USVI (only applies to yellowedge)	Feb 1 – Apr 30	May 1 – Jan 31
CORALS		
Federal	No harvest of corals allowed (stony corals, octocorals, live rock), except by permit for scientific, educational purposes.	
Puerto Rico		
USVI		
SPINY LOBSTER		
Federal	No seasonal closures. Must be landed whole.	
Puerto Rico	Size limit (> 3.5 in (8.9 cm) carapace length) and gear restrictions apply. No harvest of egg bearing females.	
USVI		
*Bajo de Sico is closed to fishing of Council managed reef fish species from Oct 1 – Mar 31, each year		

AQUARIUM TRADE SPECIES	
Federal	List of allowed species
Puerto Rico	List of allowed species; state permit required
USVI	Territorial permit required

FEDERAL RECREATIONAL BAG LIMITS	
Aggregate bag limit for:	Allowed quantity:
snapper grouper parrotfish	5 fish per person/day, or if 3 or more persons are aboard, 15 fish from aggregate per vessel/day; but not to exceed: 2 parrotfish per person/day or 6 parrotfish per vessel/day.
Angelfish, boxfish, goatfish, grunts, wrasses, jacks, scups and porgies, squirrelfish, triggerfish and filefish, tilefish	5 fish per person/day or, if 3 or more persons are aboard, 15 fish from aggregate per vessel/day, but not to exceed: 1 surgeonfish per person/day or 4 surgeonfish per vessel/day.
Spiny lobster	3 spiny lobsters per fisher/day, no more than 10 spiny lobsters per vessel/day.

QUEEN CONCH RECREATIONAL AND COMMERCIAL LIMITS	
RECREATIONAL BAG LIMIT	
Federal	3 conch per person/day, or if > than 4 persons aboard, 12 conchs per vessel
Puerto Rico	3 conch per person/day, 12 per vessel/day
USVI	6 conch per fisher/day, no more than 24 per vessel/day
COMMERCIAL LIMIT	
Federal	200 conch per vessel per day
Puerto Rico	150 conch person/day, 450 per vessel/day
USVI	200 conch per vessel/day

OTHER SPECIES RESTRICTIONS		
		Min. Size (FL)
Puerto Rico	White grunt (<i>Haemulon plumieri</i>)	8 in (203 mm)
	Honeycomb cowfish (<i>Acanthostracion polygonia</i>)	7 in (78 mm)
	Scrawled cowfish (<i>A. quadricornis</i>)	7 in (78 mm)
	Cero (<i>Scomberomorus regalis</i>)	16 in (406 mm)
	King mackerel (<i>S. cavalla</i>)	20 in (508 mm)
	Snook (<i>Centropomus undecimalis</i>)	22 in (559 mm)

SEASONAL AREA CLOSURES	
Grammanik Bank, STT	– NO fishing any fish from Feb 1 - Apr 30, except for HMS
Hind Bank, STT	– Closed year-round to all fishing and anchoring
Mutton Snapper Spawning Aggregation, STX	– NO fishing any fish from Mar 1 - Jun 30
Bajo de Sico, PR	– NO fishing of Council managed reef fish species from Oct 1 – Mar 31. NO anchoring year-round
Tourmaline Bank and Abrir la Sierra Bank, PR	– NO fishing any fish from Dec1 – Last day Feb