Regulatory Amendment 2

to the Fishery Management Plan for the Queen Conch Resources of Puerto Rico and the U.S. Virgin Islands (USVI)

Compatibility of Trip and Bag Limits in the Management Area of St. Croix, USVI

Including Final Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis

August 2013

Abbreviations and Acronyms Used

ABC	allowable biological catch
ACL	annual catch limit
APA	Administrative Procedures Act
BVI	British Virgin Islands
CEA	cumulative effects assessment
CEQ	Council on Environmental Quality
CFMC	Caribbean Fishery Management Council; Council
CZMA	Coastal Zone Management Act
DPNR	Department of Planning and Natural Resources of the USVI
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
ESA	Endangered Species Act
FEIS	final environmental impact statement
FMP	fishery management plan
FMU	fishery management unit
ITZC	inter-tropical convergence zone
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MMPA	Marine Mammal Protection Act
MPA	marine protected area
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	overfishing limit
OMB	Office of Management and Budget
OY	optimum yield
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAV	submerged aquatic vegetation
SFA	Sustainable Fisheries Act
SEFSC	Southeast Fisheries Science Center
SEIS	supplemental environmental impact statement
SERO	Southeast Regional Office
USVI	United States Virgin Islands

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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

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Proposed actions: Modify the commercial and recreational queen conch harvest limits in U.S. Caribbean federal waters.

Lead agencies: Caribbean Fishery Management Council
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Summary

The Caribbean Fishery Management Council (Council), in collaboration with the National Marine Fisheries Service, prepared Regulatory Amendment 2 to the Queen Conch Fishery Management Plan to address compatibility issues in the harvest of queen conch in the U.S. Caribbean exclusive economic zone (EEZ). Fishing and possession of queen conch in the U.S. Caribbean EEZ is only allowed in the area of Lang Bank, to the east of St. Croix, U.S. Virgin Islands (USVI). However, current regulations regarding the commercial trip limit and the recreational bag limit for the harvest of queen conch in federal waters are not compatible with USVI regulations. Compatibility of regulations is a means of enhancing enforcement efficiency.

The current trip limit in federal waters allows a licensed commercial fisherman to harvest up to 150 queen conch per day, but does not establish a harvest limit per vessel. USVI regulations allow the harvest of 200 queen conch per vessel per day regardless of the number of licensed fishermen on board. The daily recreational bag limit in federal waters allows three queen conch per person and a maximum of 12 queen conch per vessel. In contrast, the USVI daily recreational bag limit consists of six queen conch per person and a maximum of 24 per vessel.

The USVI has expressed interest in having federal regulations modified to make them compatible with the territorial limits to facilitate enforcement efforts, enhance compliance by fishers, and allow for more efficient management of queen conch resources in the U.S. Caribbean. Queen conch is currently classified as an overfished species, and it is managed under a 15-year rebuilding plan. The goal of Regulatory Amendment 2 is to consider state-federal compatibility of queen conch daily harvest limits via separate actions applicable to the commercial and recreational sectors.

At its 145th meeting (March 26-27, 2013), the Council chose as preferred alternatives to establish a daily commercial trip limit of 200 queen conch per vessel and to leave the recreational bag limit unchanged. Compatibility with the USVI's commercial regulations will reduce confusion among fishers and increase law enforcement efficiency. However, because the federal recreational bag limit is less than the territorial limit, the Council chose to maintain that lower bag limit as a preferred alternative. Increasing the recreational limit does little to assist law enforcement and may have negative consequences with respect to the continued health of the queen conch resource.

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Chapter 1. Introduction

1.1 What Actions are Being Proposed?

Fishery managers are proposing changes to the federal management of queen conch in the U.S. Caribbean through Regulatory Amendment 2 to the Fishery Management Plan (FMP) for the Queen Conch Resources of Puerto Rico and the U.S. Virgin Islands (USVI; Queen Conch FMP). This regulatory amendment considers establishing compatible regulations with USVI territorial regulations for the commercial and recreational harvest of queen conch within the context of the continued health of the resource. The USVI government has expressed interest in having federal regulations modified to make them compatible with the territorial limits to facilitate enforcement efforts, enhance compliance by fishers, and allow for more efficient management of queen conch resources in the U.S. Caribbean.

1.2 Who is Proposing the Action?

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

Photo: NOAA

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?

Queen conch (*Strombus gigas*) in federal waters of the U.S Caribbean are managed under the Queen Conch FMP (CFMC 1996). Federal waters are located in the 3 - 200 nm (6 - 370 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 (Figure 1.3.1).

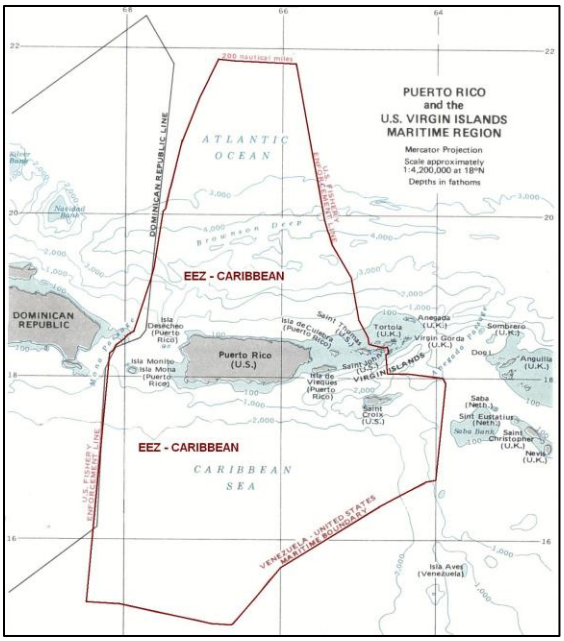
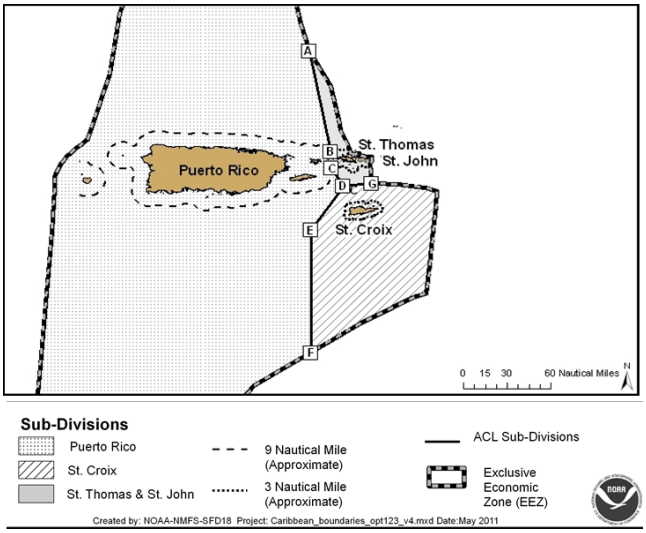


Figure 1.3.1. Jurisdictional boundaries of the Caribbean Fishery Management Council.

Queen conch is a prohibited species in the EEZ of the subzones of St. Thomas, St. John, and Puerto Rico. In the EEZ subzone surrounding St. Croix, harvest of queen conch is only allowed from November 1 to May 31 each year, specifically in the area east of 64°34' W longitude bound within the 100-fathom curve, which includes Lang Bank to the east of St. Croix (Figures 1.3.2 and 1.3.3).



Reference Point	Latitude	Longitude
D	18° 01’ 16.9636”	64° 57’ 38.817”
E	17° 30’ 00.000”	65° 20’ 00.1716”
F	16° 02’ 53.5812”	65° 20’ 00.1716”
G	18° 03’ 03”	64° 38’ 03”

Figure 1.3.2. Management area of St. Croix, USVI.

Lang Bank is a shallow bank that extends eastwards from St. Croix for a distance of 20 kilometers (km) (12.4 mi) (GPR 2003). Lang Bank lies within both federal and territorial waters. Discussions within this amendment pertain to that portion of Lang Bank within the U.S. Caribbean EEZ.

Lang Bank is described as a submerged reef complex that shoals to about 10 meters (m) (32.8 feet (ft)) in depth along the seaward edge east of St. Croix (Goenaga and Boulon 1991).

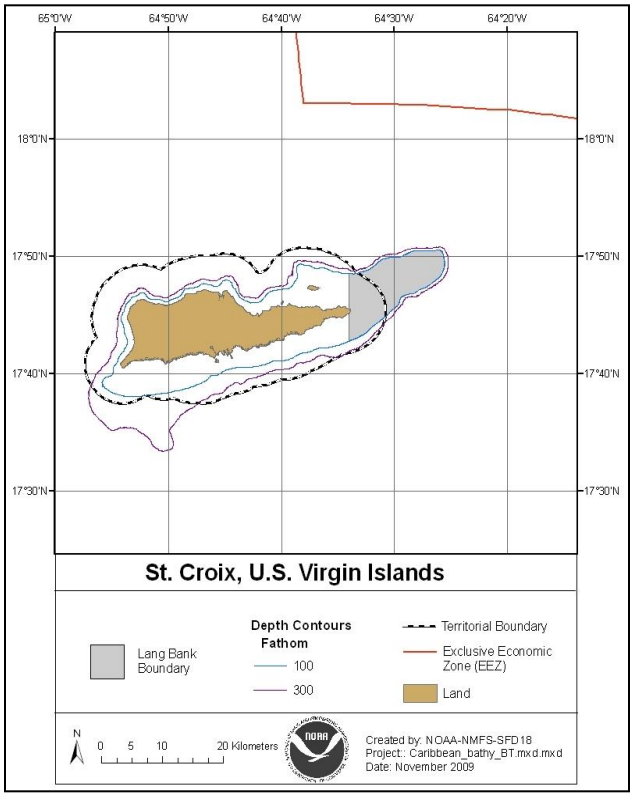


Figure 1.3.3. Map of St. Croix, USVI, including the Lang Bank area to the east (shaded in gray).

1.4 Why is the Council Considering Action?

The Council considered actions in Regulatory Amendment 2 to the Queen Conch FMP to address compatibility issues in the harvest of queen conch in the U.S. Caribbean EEZ. Current regulations regarding the commercial trip limit and the recreational bag limit for the harvest of queen conch in federal waters are not presently compatible with USVI regulations. The USVI has expressed interest in having federal waters become compatible with the territorial harvest limits because some of the harvest of queen conch in St. Croix comes from the EEZ, and that harvest must traverse territorial waters to be landed. Thus, establishing compatible regulations may aid enforcement by eliminating the inconsistency in the number of queen conch allowed to be possessed on the water.

Compatibility of regulations is a proactive measure that may also allow for better control of fishing pressure on the queen conch resource. Enforcement may be facilitated by consistent regulations, which allow for straightforward application of the law, and may reduce confusion on the part of the fishers. This may result in better understanding and cooperation by the fishers.

Purpose and Need

This regulatory amendment addresses the current incompatibility of regulations for the commercial and recreational harvest of queen conch between the U.S. Caribbean exclusive economic zone (EEZ) and USVI territorial regulations.

The USVI government has expressed the need to have compatible regulations between federal and territorial waters to facilitate enforcement efforts in the region, while ensuring the long-term health of the resource. Queen conch is currently classified as an overfished species, and it is managed under a 15-year rebuilding plan. Establishing compatible regulations may allow for more efficient management and enforcement of queen conch regulations in the U.S. Caribbean, and may aid fishers in complying with harvest regulations.

The queen conch is classified as overfished in the latest NMFS report to Congress on the Status of U.S. Fisheries, and the species is currently in the 8th year of a rebuilding plan designed to rebuild the stock by 2020 (NMFS Status of U.S. Fisheries, 4th Quarter 2012).

The Queen Conch FMP was implemented in 1997, and it includes as one goal a management program to rebuild conch resources in federal waters surrounding Puerto Rico and the USVI. Measures in the FMP included (among others) minimum size limits to prevent the harvest of immature individuals and end recruitment overfishing (i.e., when the spawning biomass of the population is reduced to such an extent that the number of larvae and recruits produced are not sufficient to replenish the population). The management measures in the Queen Conch FMP were mostly compatible with regulations passed in 1994 by the USVI government for queen conch harvest. Landing queen conch whole in shell and a minimum shell length size of 9 inches (in) (22.9 cm) from the spire to the distal end of the shell or a 3/8 in (9.5 mm) lip thickness are required by both federal and USVI regulations, as well as in Puerto Rico commonwealth waters. However, some of the regulations set by the Queen Conch FMP were more restrictive than USVI territorial regulations (e.g., recreational bag limits, ban on the use of hookah gear).

The history of actions for the management of queen conch in federal and USVI waters can be found in Sections 1.5.1 and 1.5.2, of this document, respectively. Recent federal actions concerning compatibility of regulations for the queen conch include Regulatory Amendment 1 to the Queen Conch FMP, implemented in 2011 (CFMC 2010). This regulatory amendment established a compatible seasonal closure with the USVI (open season from November 1 to May 31 each year in the EEZ subzone of St. Croix) as well as a compatible harvest quota closure for queen conch in federal waters (quota consists of an annual harvest of 50,000 pounds (lbs) for combined federal and St. Croix territorial waters). When that quota is reached and the USVI closes territorial waters off St. Croix to the harvest and possession of queen conch, NMFS will concurrently close the Caribbean EEZ in the area east of 64°34’ W. The EEZ closure will remain in effect until the next fishing season for territorial waters opens November 1.

Throughout the U.S. Caribbean, the queen conch fishery occurs primarily in Puerto Rico commonwealth and USVI territorial waters (state waters). Establishing compatible regulations could facilitate enforcement efforts in the region and aid in the recovery of the queen conch stock. In the USVI, enforcement of queen conch regulations appears to be limited and may be lacking in more isolated areas of the coastline (Tobias 2005). Increased enforcement presence and better monitoring of queen conch harvest activities have been identified as necessary measures to determine the effectiveness of present management regulations in the USVI (Tobias 2005).

Regulations in the U.S. Caribbean EEZ are enforced through a Joint Enforcement Agreement between NMFS and the State natural resources agencies: the Department of Planning and Natural Resources (DPNR) in the USVI, and in Puerto Rico, by the Department of Natural and Environmental Resources. There are presently no NMFS enforcement agents located in the USVI. The U.S. Coast Guard also works closely with NMFS and State partners to provide patrol services necessary to monitor the fisheries regulations enacted by the Council (NMFS Office of Law Enforcement, http://www.nmfs.noaa.gov/ole/index.html, accessed on April 2013).

This regulatory amendment reviews and evaluates actions and alternatives to address compatibility issues in the commercial and recreational harvest of queen conch between the EEZ and the USVI. Establishing compatible regulations for the harvest of queen conch has been discussed extensively in previous Council meetings.

1.5 Management History

1.5.1 Federal Management History

Conch resources in the U.S. Caribbean EEZ have been managed since 1996 as part of the Caribbean conch resources fishery management unit (FMU) of the Queen Conch FMP (CFMC 1996). The following management actions summarize measures directly affecting conch resources in U.S. Caribbean federal waters. For a detailed discussion, please see the specific FMP or amendment, as referenced. Table 1.5 summarizes current queen conch regulations in the U.S. Caribbean.

Queen Conch FMP (CFMC 1996)

This FMP included a final Environmental Impact Statement (FEIS), and a Regulatory Impact Review (RIR). The regulations in the Queen Conch FMP became effective in January 1997 (61 FR 65481). The Queen Conch FMP accomplished the following:

- Restricted the taking of queen conch in or from the EEZ around Puerto Rico and the USVI in order to restore overfished stocks;
- Defined the Caribbean conch resources FMU to include 12 species of gastropods, and described objectives for conch resources in the Caribbean;
- Imposed a minimum size limit for queen conch harvest based on: 9 inches (22.9 cm) in length, that is, from the tip of the spire to the distal end of the shell, and 3⁄8 inch (9.5 mm) in lip width at its widest point;
- Required that all species in the FMU be landed in the shell and prohibited the sale of undersized queen conch and queen conch shells;
- Established a bag limit of three queen conch per day for recreational fishers, not to exceed 12 per boat, and a limit of 150 queen conch per day for licensed commercial fishers;
- Closed the harvest season for queen conch coincident with their peak

spawning periods: from July 1 through September 30, each year, no person may fish for queen conch in the Caribbean EEZ and no person may possess on board a fishing vessel a queen conch in or from the Caribbean EEZ;

- Prohibited the harvest of queen conch by surface-supplied air gear (HOOKAH) in the EEZ to protect deep-water spawning stocks.

Essential Fish Habitat (EFH) Generic Amendment to the FMPs of the U.S. Caribbean (CFMC 1998).

The Generic EFH Amendment included a Draft Environmental Assessment (EA), which was partially approved in February 1999 (64 FR 14884). In 2004, an FEIS was prepared and its Record of Decision was published in May 2004 (CFMC 2004; 69 FR 29693). The EFH Generic Amendment accomplished the following:

- Identified EFH for species within the Queen Conch FMP;
- Identified actions to encourage the conservation and enhancement of EFH;
- Identified measures to minimize to the extent practicable the adverse effects of fishing on EFH.

2005 Comprehensive Sustainable Fisheries Act (SFA) Amendment (including Amendment 1 to the Queen Conch FMP) (CFMC 2005).

The SFA Amendment included a supplementary environmental impact statement, an RIR, and a Regulatory Flexibility Analysis (RFA). Regulations were implemented in November 2005 (70 FR 62073). The SFA Amendment accomplished the following:

- Prohibited fishing for or possessing on board a fishing vessel, a Caribbean queen conch in or from the Caribbean EEZ, except during October 1 through June 30 in the area east of 64°34'W longitude which includes Lang Bank, east of St. Croix, USVI;
- Defined biological reference points and stock status criteria for queen conch;
- Established a 15-year rebuilding schedule for queen conch;
- Designated EFH for queen conch; and minimized adverse impacts on such habitat to the extent practicable. Banned the use of traditional gear (e.g., traps, pots, gillnets, trammel nets, and/or bottom longlines) year-round within a marine protected area in Lang Bank, St. Croix, which applies to all fisheries, including those for swordfish, tuna, and shark;
- Moved all species of Caribbean conch, with the exception of queen conch, to a data collection only category, thereby removing fishery management restrictions on those species. Redefined the "Caribbean conch resource" as "Caribbean queen conch or queen conch", to refer to the species *Strombus gigas*.
- Established as a requirement that queen conch in or from the Caribbean EEZ must be maintained with meat and shell intact;

- Developed a memorandum of understanding between NMFS and the governments of Puerto Rico and the USVI to develop compatible queen conch regulations.

Regulatory Amendment 1 to the Queen Conch FMP of Puerto Rico and the USVI (CFMC 2010)

This regulatory amendment established compatible closures, and included an RIR and an EA. It became effective on May 31, 2011 (76 FR 23907). Regulatory Amendment 1 accomplished the following:

- Extended the 3-month (July 1 through September 30) closure in federal waters in the area east of 64°34'W longitude, which includes Lang Bank east of St. Croix, USVI, to a 5-month closure, from June 1 through October 31 each year, which is compatible with the USVI seasonal closure;
- Implemented a compatible queen conch harvest seasonal closure for federal waters in the EEZ subzone of St. Croix. When the USVI closes territorial waters off St. Croix to the harvest and possession of queen conch for all sectors, NMFS will concurrently close the Caribbean EEZ, in the area east of 64°34' W longitude, which includes Lang Bank, east of St. Croix, USVI. The closure of the adjacent EEZ will be effective until the next fishing season for territorial waters opens November 1.

Amendment 2 to the Queen Conch FMP and Amendment 5 to the Reef Fish FMP of Puerto Rico and the USVI (2010 Caribbean Annual Catch Limit (ACL) Amendment) (CFMC 2011a)

The 2010 Caribbean ACL Amendment included an FEIS, RIR, and RF, and became effective on January 30, 2012 (76 FR 82404). This amendment accomplished the following:

- Established ACLs for queen conch harvest in the EEZ. The ACL for the EEZ subzone of St. Croix is 50,000 pounds (lbs) (22,680 kg) of combined St. Croix territorial and federal landings. For the EEZ subzone of Puerto Rico and the EEZ subzone of St. Thomas/St. John, the applicable ACL was set at zero, as harvest has been prohibited in those federal waters since 2005.
- Amended framework measures for the Queen Conch FMP.
- Revised management reference points (maximum sustainable yield (MSY), optimum yield, overfishing limit, acceptable biological catch) for queen conch in the U.S. Caribbean.

Comprehensive ACL Amendment for the FMPs of the U.S. Caribbean (including Amendment 3 to the Queen Conch FMP) (2011 Caribbean ACL Amendment) (CFMC 2011b).

The 2011 Caribbean ACL Amendment included an FEIS, Biological Assessment, RIR, RFA, and Social Impact Assessment. The amendment became effective on January 29, 2012 (76 FR 82414). With respect to queen conch, the 2011 Caribbean

ACL Amendment accomplished the following:

- Removed eight species of conch from the Queen Conch FMP. The queen conch (*Strombus gigas*) remained in the FMP.

1.5.2 USVI Management History

Management of the queen conch fishery in waters up to three nautical miles from the shore of the Territory of the USVI (Territory) is the responsibility of the DPNR. The USVI fishing year commences July 1st, when fishers are required by USVI law to renew their licenses, and extends to June 30th of the following year (Kojis and Quinn 2012). Fishermen are required to report their catch to the DPNR on a monthly basis. Management actions directly affecting the queen conch in waters of the USVI are summarized below.

The queen conch fishery in St. Thomas and St. John was closed during 1988 through 1992 (5-year moratorium) due to low conch stocks reported around those areas (Gordon 2010). When the fishery was reopened, there were insufficient harvest restrictions to protect the resource from a recurrence of overfishing. Consequently, benefits to the population that resulted from the moratorium were erased almost immediately (Mr. Roy Adams, Commissioner DPNR, USVI, pers. comm., in CFMC 1996). St. Croix had size limit regulations in place since 1988, since the conch fishery remained open.

In July 1994, the USVI approved regulations to prevent overfishing of the queen conch resource in the Territory (VIRR 1994). These regulations accomplished the following:

- Established a closed season from July 1 through September 30 each year, for the harvest of queen conch in territorial waters;
- Established a daily limit on the number of queen conch landed for personal use, which must not exceed 6 per person or 24 per boat, unless the person has a commercial fishing permit that entitles the fisher to a maximum of 150 queen conch per day;
- Established a size limit for all queen conch harvested which must be at least 9 inches in length or at least 3/8-inch in lip thickness in any location;
- Established a requirement to land queen conch whole and in the shell;
- Prohibited the sale of queen conch or queen conch shells that do not conform to minimum size requirements.

During the 2000s, a significant increase in the quantity of queen conch harvested in St. Croix raised concerns in USVI authorities that queen conch were being overharvested (Kojis and Quinn 2012). In response to these concerns, in 2007, the USVI territorial government modified queen conch regulations in the Territory to address overfishing. The regulations were implemented in June 2008 and accomplished the following:

- Extended the seasonal closure for the harvest of queen conch two months, prohibiting harvest from June 1 through October 31, each year. This two-month extension was based upon higher landings reported above the MSY (60,000 lbs), as determined by the DPNR (Gordon 2010).
- Implemented a landings quota of 50,000 lbs annually for the fishing year per district (i.e., St. Croix and St. Thomas/St. John). After that quota is reached, the season would be closed until November 1 of that year (Gordon 2010).
- Modified the commercial harvest quota to establish a maximum of 200 queen conch per day per registered commercial vessel (previously 150 per day per commercial fisher) (Gordon 2010).

In the 2007 fishing season, the USVI queen conch closed season was extended temporarily until January 1, 2008 (three additional months). Once reopened, landings were limited to the annual 50,000 lbs and to the commercial quota of 200 queen conch per vessel, as discussed above (USVI Annex. Interim Emergency Conch Regulations, August 2007).

In April 2009, the queen conch harvest in St. Croix exceeded the 50,000 lb annual quota for that district. At that time, the St. Croix territorial queen conch fishery for the 2008/2009 fishing year was closed from May 1 until the end of the USVI fishing year (November 1).

The USVI government requested that the Council establish regulations compatible with these 2008 queen conch territorial regulations. In response to this request, Regulatory Amendment 1 to the Queen Conch FMP, discussed above in Section 1.5.1, was implemented in 2011 (CFMC 2010).

Table 1.5. Current regulations for queen conch management in federal, USVI, and Puerto Rico waters.

Jurisdiction	Seasonal Closure	Harvest Quota	Commercial Limit	Recreational Bag Limit	Size limit	Landing Restrictions	Gear Restrictions	Sale Restrictions
Federal waters Fishing for or possession of queen conch in the EEZ is prohibited, except in the area east of 64°34' W. long., which includes Lang Bank, STX, USVI.	Jun 1 - Oct 31 (5 months) (Area east of 64°34' W. long. which includes Lang Bank, east of St. Croix, USVI)	50,000 lbs (ACL) (Season closes when STX territorial limit is reached).	Not more than 150 queen conch per fisher per day.	3 queen conch per person/day, or if > than 4 persons aboard, 12 queen conch per boat	9 in (22.9 cm) in length, from the tip of the spire to the distal end of the shell, and 3/8 in (9.5 mm) in lip width at its widest point. A queen conch with a length of at least 9 in (22.9 cm) or a lip width of at least 3/8 in (9.5 mm) is not undersized.	Queen conch in or from the U.S. Caribbean EEZ must be maintained with meat and shell intact.	Hookah gear cannot be used while harvesting queen conch.	No specific sale restriction but: during the closure, no person may fish for or possess on board a fishing vessel, a Caribbean queen conch, in or from the Caribbean EEZ, in the area east of 64°34' W. longitude which includes Lang Bank, east of St. Croix, U.S. Virgin Islands.
USVI waters	Jun 1 - Oct 31 (5 months) Once the ACL or June 1st is reached, the season will close until November 1st of that year. Possession of queen conch during the closed season is illegal.	50,000 lbs STX 50,000 lbs STT/STJ Thereafter season will close until Nov. 1st of that year. All queen conch must be landed and reported in the district from which they were harvested. No harvest of undersized conch.	200 queen conch per day per registered commercial fishing vessel	6 queen conch per day per recreational (personal use) fisher; not to exceed 24 per boat per day	Min. size of 9-in shell length from the spire to the distal end, or 3/8 in lip thickness. No harvest of undersized queen conch. No possession of queen conch meats smaller than 2 queen conch per pound uncleaned or 3 queen conch per pound cleaned.	Queen conch must be landed alive and whole in the shell at final landing site. No disposal of shell at sea, before landing. Taking queen conch to offshore cays and islands for purpose of removing from shell is prohibited. Transport of queen conch meat out of shell over open water is prohibited.	Hookah: Not on USVI regulations, but prohibited (145th Council Meeting Transcription (March 2013)).	No sale of undersized queen conch shell or meat from undersized queen conch. No sale of imported queen conch meat unless shipment is accompanied by a CITES export permit and shipment is cleared at the Port of Miami. Possession of queen conch during the closed season is illegal (rather than prohibiting the sale of imports).
Puerto Rico waters[1]	Aug 1 - Oct 31 (3 months)	None	150 queen conch per day per fisherman, or 450 per vessel per day, whichever is less.	3 queen conch per person per day or a max. of 12 per boat per day, whichever is less.	Min. size of 9-in shell length from the spire to the distal end, or 3/8 in lip thickness.	Queen conch can be extracted from shell while on boat, but not underwater in PR waters.	No use of surface supplied (i.e. hookah) gear.	No sale of undersized queen conch.

[1] In February 2013, the Puerto Rico Department of Natural and Environmental Resources (DNER) temporarily decreased the commercial trip limit to 100 queen conch per licensed fisher/day or a maximum of 300 queen conch per vessel/day, whichever is less. In addition, fishermen will be allowed to extract queen conch underwater, instead on while on boat. These temporary changes will be effective until July 31, 2013 (DNER, Administrative Order 2013-02, February 27, 2013).

1.6 Current Fishing Practices of the St. Croix Queen Conch Commercial Sector

This section discusses current commercial fishing practices in St. Croix, USVI. Actions in this regulatory amendment would apply to the U.S. Caribbean EEZ, but would only affect the EEZ management subzone of St. Croix, which is the only area in federal waters where fishing for queen conch is allowed (Figures 1.3.2 and 1.3.3). A description of the commercial and recreational fishing sectors in St. Croix is provided in Sections 3.2.2.1 and 3.2.2.2 (Affected Environment), respectively.

The most recent census of the marine commercial fishers of the USVI reported that in 2010-2011, 218 commercial fishermen were registered in St. Croix (Kojis and Quinn 2012). In their report, 42.2 percent of the interviewed fishers (n = 152) in St. Croix reported fishing for queen conch. In addition, during that time period, 59.5 percent of the interviewed fishers (n = 152) reported that they fished by diving (e.g., SCUBA and snorkel free diving) in St. Croix. Sixty of 62 fishermen interviewed reported that they fished in territorial waters of St. Croix (less than 3 miles from shore) and 26 reported fishing in federal waters (more than 3 miles from shore) by using some type of diving gear (numbers are not additive because some fishermen fish in both territorial and federal waters). Diving is used to harvest queen conch, but also lobster and some species of fish, therefore this information is not exclusive for queen conch (Kojis and Quinn 2012).

The most recent commercial landings data from St. Croix obtained from trip ticket reports for the period between 2009 and 2012 indicate that an average of 40 fishermen per year harvested queen conch. Section 3.3.1 provides more information about the number of queen conch fishers fishing for queen conch per area (territorial and/or federal waters).

For the purposes of this regulatory amendment, the most recent queen conch commercial landings data from the USVI fishing years 2009/2010, 2010/2011, and 2011/2012 were analyzed to obtain trip information about the number of queen conch harvested in St. Croix territorial and federal waters. These landings data were obtained from trip ticket reports from the USVI, as reported by the USVI Department of Planning and Natural Resources (DPNR). The USVI fishing year (for all fisheries) commences July 1st, when fishers are required by USVI law to renew their licenses, and extends to June 30th of the following year.

In the USVI, queen conch landings are reported as either cleaned (e.g., shell, and operculum, skin, mantle, and/or head removed from animal (FAO 2009) or uncleaned meat (e.g., only shell is removed) (Cimo et al. 2012). Therefore, queen conch landings were converted from pounds to numbers in two ways: 1) assuming the landings represent cleaned queen conch, and

2) assuming the landings represent uncleaned queen conch. The conversion used is the same as is used by the DPNR which assumes three cleaned queen conch meats (i.e., tissue without shell) or two uncleaned queen conch meats weigh one pound (V.I.C., Title 12, Chapter 9A, §316-1 & 316-4).

The number of queen conch landed per trip by fishing area in St. Croix for the most recent fishing years combined (2009/2010, 2010/2011 and 2011/2012) is presented in Table 1.6.1 and in Figure 1.6.1 below. A total of 3,411 trips that landed queen conch were reported for those years. Landings of queen conch from the EEZ for those fishing years represent 28 percent of the total (territorial plus EEZ) St. Croix queen conch landings for those years (Table 1.6.2).

Table 1.6.1. Details of St. Croix commercial trips that harvested queen conch for the 2009/2010, 2010/2011, and 2011/2012 fishing years. Harvest was defined as number of queen conch per trip, and the three fishing areas are St. Croix territorial waters (Territory), federal waters (EEZ), and trips where the fishing area was not provided (Area Not Provided).

	Uncleaned Queen Conch			**Cleaned Queen Conch**		
	Territory	**EEZ**	**Area Not Provided**	**Territory**	**EEZ**	**Area not provided**
Average number of queen conch	101.3	106.2	112.9	152.0	159.4	169.4
Queen conch commercial trips	2,126	934	351	2,126	934	351

Source: SERO using USVI trip data

Table 1.6.2. St. Croix commercial queen conch landings (pounds) by fishing year and by area fished.

Year	**Territory**	**EEZ**	**Area Not Provided**	**Total**
2009/2010	42,015	22,036	8,923	72,974
2010/2011	36,942	23,403	10,899	71,244
2011/2012	28,738	4,173	None	32,911
Total	107,695	49,612	19,821	177,128

Source: SERO using USVI trip data

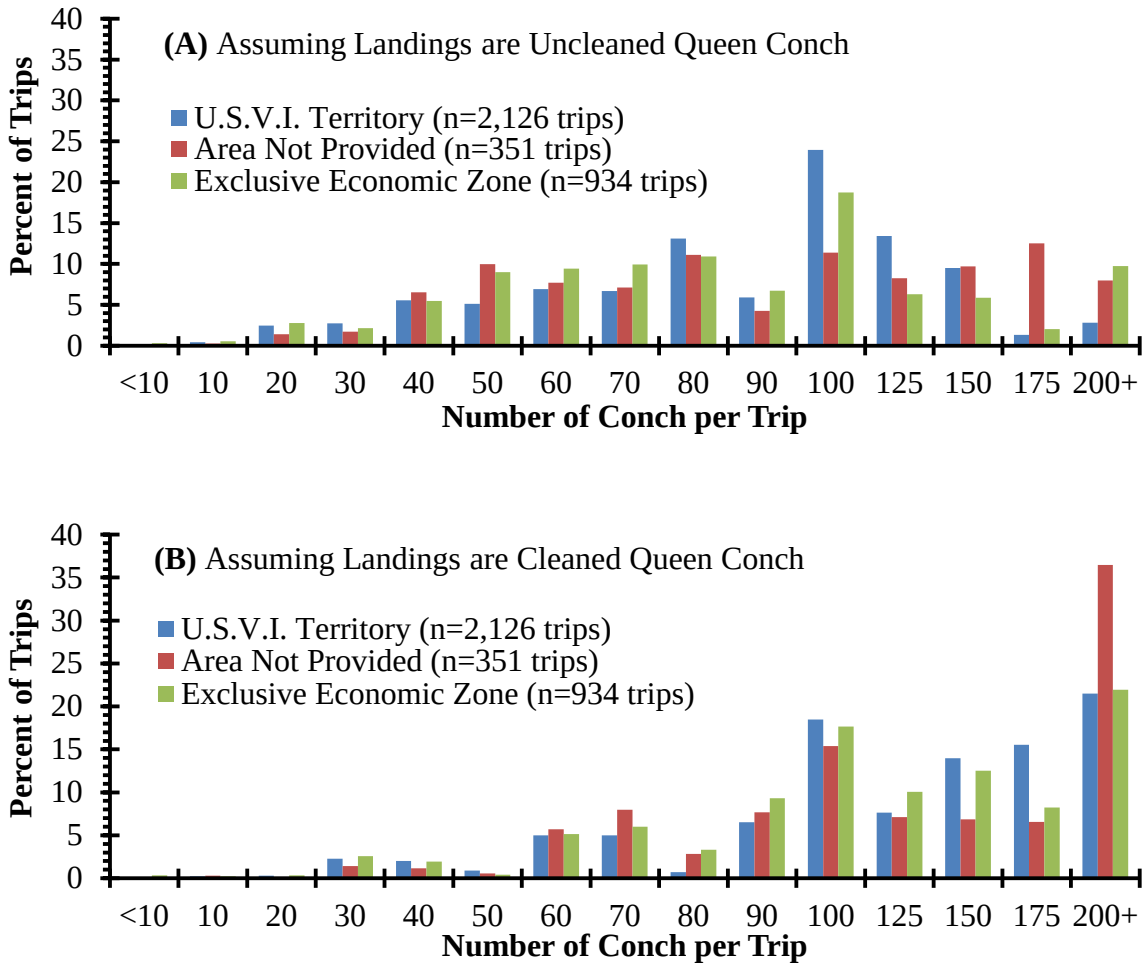


Figure 1.6.1. Percent of St. Croix commercial trips that harvested queen conch by fishing area for the fishing years 2009/2010, 2010/2011, and 2011/2012. Harvest was defined as number of queen conch per trip, and the three fishing areas are St. Croix territorial waters (USVI Territory), federal waters (EEZ), and trips where the fishing area was not provided (Area Not Provided). Figure A assumes pounds of queen conch landed were reported as uncleaned, and Figure B assumes pounds of queen conch landed were reported as cleaned.

Twenty-two of the fishermen that contributed to these trips did not provide details on the location fished (n = 351 trips), and their records from the past three years were further examined. Eleven of these 22 fishermen had historical behavior of only fishing in Territory waters or in the EEZ. The trips with unreported fishing areas from these 11 fishermen were modified to reflect their historical behavior. For example, queen conch trips for fishermen who only fished in the EEZ in the past but then did not provide the fishing location were assigned to the EEZ. This allowed the fishing location to be reported for 135 of the 351 queen conch trips. Sixty-one of these 135 trips were assigned to the EEZ increasing the total number of EEZ trips from 934 to 995

trips. We could not determine the fishing location for the other 216 trips, so they were left as trips with area not provided and excluded from the analysis of EEZ trips.

Assuming that queen conch landings were reported as uncleaned queen conch resulted in 16.7 percent (n = 167) of the trips in the EEZ harvesting more than 150 queen conch, with 9.1 percent (n = 91) of the trips in the EEZ during those years harvesting more than 200 queen conch. Conversely, if it is assumed that queen conch landings were reported as cleaned queen conch, 42.4 percent (n = 422) of the EEZ trips harvested more than 150 queen conch and 20.9 percent (n = 208) of the trips in the EEZ harvested more than 200 queen conch.

The current commercial limit for the harvest of queen conch in the EEZ is 150 per licensed commercial fisherman per day. Regardless of whether queen conch landings were reported as cleaned or uncleaned, these data indicate that, in each of the three fishing years, some portion of the landings from the EEZ exceeded the daily commercial trip limit of 150 queen conch per licensed fisherman. However, this information does not indicate if the trips that exceeded the EEZ commercial limit had two or more fishermen on the same vessel, a situation that could explain the harvest over the current commercial limit.

Although the most common practice in the USVI is for one licensed fisherman and one or more unlicensed helpers to fish from a single vessel, it is not rare for a vessel to have at least one other license holder aboard, with two being the most probable number (Caribbean Fishery Management Council 141st Regular Meeting; Kojis and Quinn 2012). Licensed fishermen who co-own boats, who do not own a boat, or whose boat is under repair, may choose to fish with another commercial fisher (Kojis and Quinn 2012). The 2011 fishermen census of the USVI (Kojis and Quinn 2012) reported that in St. Croix, from a total 123 interviewed fishermen, 45 indicated that they fish with other licensed fishermen (36.6%). However, these numbers are not exclusive for queen conch fishers (Table 1.6.3).

Table 1.6.3. Percentage of fishermen who fished alone and with others in 2010-2011.

	St. Thomas/St. John		St. Croix		U.S. Virgin Islands	
	# of Fishermen	% of Fishermen	# of Fishermen	% of Fishermen	# of Fishermen	% of Fishermen
Fish Alone	12	16.2%	16	13%	28	14.2%
Fish with helpers	65	87.8%	105	85.4%	170	86.3%
Fish with other commercial fishermen	18	24.3%	45	36.6%	63	32%
# Responses	74		123		197	

Source: Kojis and Quinn (2012)

To determine if the commercial trip limit in the EEZ has been exceeded during that period, as suggested by the data presented in Figure 1.6.1, the most recent landings data for queen conch in St. Croix were analyzed to determine which of the 3,411 fishing trips that reported landing queen conch had only one licensed fisherman in the vessel, and which of those trips had more than one licensed fisherman on board. To accomplish this, landings records for the three most recent fishing years (2009/2010, 2010/2011, and 2011/2012) having the same vessel identification number and date of landing were matched to determine the total number of licensed fishermen harvesting queen conch on a trip. If dates and vessel numbers did not match then the trip was assumed to have one licensed commercial fisherman on board. The trips that did not have vessel information (n = 116 trips) were assumed to have only one licensed commercial fisherman on the trip. Additionally, the possibility exists that there were more queen conch trips that contained more than one licensed commercial fisherman but only one fisherman reported the landings. Thus, this was a conservative analysis. Eighty-six trips from 11 different fishermen had the same date, vessel identification number, and reported more than one fisherman harvesting queen conch. None of these trips reported more than two licensed commercial fishermen on a trip. The landings from these matching records were combined to determine the total conch harvest per vessel. The combined 86 trips were divided in half, to account for two instances when two trips were reported for the same vessel on the same day. This resulted in in 43 “dual” trips of which 26 trips took place in St. Croix, USVI territorial waters and 17 trips took place in the EEZ. This reduced the total queen conch trips in the EEZ from 995 to 978 trips.

Assuming the queen conch landings per vessel for trips with multiple fishermen were reported as uncleaned, the queen conch harvested in the EEZ ranged from 80 - 200 per trip, with an average of 109.2 per trip. Only one trip in the EEZ reported landings greater than 150 queen conch per vessel and no trips reported more than 200 queen conch per vessel. Alternatively, assuming that landings were reported as cleaned queen conch, the queen conch harvested per vessel in the EEZ ranged from 120 - 300 per trip, with an average of 163.8 per trip. Nine (52.9%) of these trips exceeded the 150 queen conch federal trip limit whereas only one trip (5.9%) exceeded 200 queen conch per vessel.

Table 1.6.4 provides statistics of the number of queen conch per trip harvested in the EEZ for the three most recent fishing years separated by trips declared as having one fisherman or having two fishermen on a trip. Only a small number of queen conch trips were declared to have more than one fisherman on a vessel (~2% of trips) in the EEZ. Either 16.9 percent of the trips that landed queen conch, if reported uncleaned, or 41.3 percent, if reported cleaned, exceeded the current federal limit for an individual licensed fisherman.

Table 1.6.4. Details of the number of trips in St. Croix that harvested queen conch for the fishing years of 2009/2010, 2010/2011, and 2011/2012 inside the EEZ. The details were separated into trips that exceeded the 150 queen conch per trip and 200 queen conch per trip limits. The number in parenthesis are the percentage of the total number of trips inside the EEZ (n = 978 trips).

	Total # of Trips	**Uncleaned**			**Cleaned**		
		> 150 queen conch	>150 to <200 queen conch	> 200 queen conch	> 150 queen conch	>150 to <200 queen conch	> 200 queen conch
Only One Fisherman	961	165 (16.9%)	74 (7.6%)	91 (9.3%)	404 (41.3%)	198 (20.2%)	206 (21.1%)
Two Fishermen*	17	1 (<1%)	1 (<1%)	0 (0%)	9 (<1%)	8 (<1%)	1 (<1%)

* The current federal commercial limit allows each licensed commercial fisherman in a vessel to harvest up to 150 queen conch per day.

Source: SERO using USVI trip data.

Chapter 2. Proposed Actions

2.1 What are the Proposed Actions?

There are two actions proposed in this regulatory amendment:

Action 1: Modify the trip limit for the commercial harvest of queen conch in the U.S. Caribbean exclusive economic zone (EEZ).

Action 2: Modify the bag limit for the recreational harvest of queen conch in the U.S. Caribbean EEZ.

2.2 List of Alternatives for Action 1: Queen Conch Commercial Trip Limit in the U.S. Caribbean EEZ

ACTION 1: Modify the trip limit for the commercial harvest of queen conch in the U.S. Caribbean EEZ.

Alternative 1: No Action. Do not modify the current trip limit for the commercial harvest of queen conch in the U.S Caribbean EEZ, which allows no more than 150 queen conch per licensed commercial fisherman per day.

Alternative 2: **Preferred** Modify the trip limit for the commercial harvest of queen conch in the U.S. Caribbean EEZ to be consistent with the U.S. Virgin Islands (USVI) limit, which consists of no more than 200 queen conch per vessel per day.

Alternative 3: Modify the trip limit for the commercial harvest of queen conch in the U.S. Caribbean EEZ to allow for no more than 150 queen conch per vessel per day if there is one licensed commercial fisherman on board, or no more than 200 queen conch per vessel per day if more than one licensed commercial fisherman is on board.

Discussion

Proposed Action 1 would apply to the U.S. Caribbean EEZ, but will only affect the management subzone of St. Croix, which is the only area in federal waters where fishing for queen conch is currently allowed. The purpose of this management action is to consider alternatives that may aid enforcement efforts in federal and USVI territorial waters by modifying the current commercial trip limit for the harvest of queen conch in federal waters. Action 1 proposes to modify the commercial trip limit to go from an individual limit to a vessel limit. The current trip limit in federal waters allows a person with a valid commercial fishing license issued by the USVI (or Puerto Rico) to harvest up to 150 queen conch per day, but does not establish a harvest limit per vessel. As a result, if a vessel has more than one licensed fisher onboard, each licensed fisher is allowed to harvest up to 150 queen conch. Even though the most common practice is for one licensed fisherman with his helpers to be on board, it is not rare for a vessel to have on board at least one more license holder, with a total of two being the most common multiple (Caribbean Fishery Management Council 141st Regular Meeting; Kojis and Quinn 2012; Section 1.6 of this document). USVI territorial regulations establish a maximum of 200 queen conch per vessel, regardless of the number of people on board. The USVI has expressed interest in having federal waters become compatible with the territorial trip limit because some of the harvest of queen conch in St. Croix comes from the EEZ, and that harvest must traverse territorial waters to be landed. Thus, establishing compatible regulations would aid enforcement and enhance compliance by eliminating the inconsistency in the number of queen conch allowed to be possessed on the water.

As discussed by members of the Caribbean Fishery Management Council (Council) during past meetings, compatible trip limits could also help manage queen conch more effectively, as fishing with the current federal harvest limit may allow for a more rapid rate of harvest when more than one licensed fisher is aboard the vessel. However, Action 1 would not have any overall effect on the total amount of harvest that is currently allowed from St. Croix territorial and federal waters, because total harvest is governed by the 50,000 pound (lb) quota.

The annual catch limits (ACLs) for the U.S. Caribbean were estimated based on the Caribbean wide overfishing limit (OFL). The Caribbean-wide OFL includes an explicit and known commercial harvest component, and an unknown but implicit recreational average catch OFL. ACLs of zero were established for federal waters surrounding St. Thomas/St. John and Puerto Rico, as harvest has been prohibited in those federal waters since 2005. The allowable harvest of queen conch from St. Croix territorial and federal waters combined is 50,000 lbs (ACL quota) and is based on commercial landings. This ACL for queen conch in the EEZ serves as a proxy for the harvest that is occurring in both the commercial and recreational sectors of the fishery. When total commercial harvest reaches that level and the USVI closes territorial waters off St. Croix to the harvest and possession of queen conch, the National Marine Fisheries Service

(NMFS) will concurrently close the St. Croix EEZ to the harvest and possession of queen conch. This closure would apply to both the commercial and recreational sectors.

Alternative 1 is the no action alternative and would not change the current commercial trip limit in the EEZ as established by the Queen Conch FMP in 1996. As discussed earlier, the current commercial trip limit allows a person with a valid commercial fishing license issued by the USVI (or Puerto Rico), to harvest up to 150 queen conch per day from EEZ waters off St. Croix. In contrast, the commercial trip limit in USVI territorial waters is 200 queen conch per vessel, therefore, **Alternative 1** would not be compatible with USVI regulations. The current harvest allowance in federal waters also provides the opportunity of harvesting queen conch at a more rapid rate than provided in the following alternatives because it does not put a cap on the number of queen conch that can be fished if more than one licensed person is on board. As discussed in the previous paragraph, continued fishing in the EEZ at the present level of effort could potentially cause the annual queen conch quota to be reached more quickly, resulting in a shortened fishing season.

Preferred Alternative 2 would change the current EEZ commercial trip limit to be compatible with the USVI's commercial limit, adjusting the trip limit for the EEZ from 150 queen conch per licensed fisherman to 200 queen conch per vessel. As discussed above, the current trip limit in federal waters allows a fisherman with a valid commercial license to legally harvest up to 150 queen conch per day, but does not establish a limit per vessel. USVI territorial regulations establish a harvest maximum of 200 queen conch per vessel, regardless of the number of licensed persons on board. **Preferred Alternative 2** would implement a daily trip limit identical to the USVI. This would allow for efficiency in enforcement, as there would be no differences in the quantity of queen conch allowed to be harvested in federal versus in territorial waters and therefore no confusion as to whether the catch on a particular trip is legal.

Under proposed **Preferred Alternative 2**, if there is only one licensed fisher on board, which is the most common situation, and the daily trip limit is changed from 150 queen conch per licensed fisher to 200 queen conch per vessel to be compatible with the USVI, a licensed fisherman fishing alone may increase his harvest by 50 additional queen conch to reach the new vessel/trip limit. This higher individual harvest, as discussed earlier, may affect the rate at which the ACL quota in St. Croix is achieved (i.e., quota might be reached faster), potentially causing the fishing season to be shortened. **Alternative 3,** discussed further below, was proposed to address this additional harvest. Conversely, if more than one fisherman is on board on a fishing trip, and the daily trip limit is changed to 200 queen conch per vessel, then these fishermen would have their allowable combined catch reduced, which may result in a reduction in the rate of harvest when compared to current regulations, likely reducing the rate at which the ACL is reached.

To predict the impact of **Preferred Alternative 2** on total queen conch landings in St. Croix, queen conch landings for the three most recent fishing seasons (the general USVI fishing season runs from July 1 of one year to June 30 the following year) in St. Croix (2009/2010, 2010/2011, and 2011/2012) (Table 1.6.2) were modified following the methods discussed in Section 1.6 of this document (e.g., to distinguish between fishing trips with different number of licensed commercial fishermen) and predictions were based on the obtained results. In addition to the general methods discussed in Section 1.6, other modifications to the landings data were made to address specific questions from this alternative. These modifications included making no change to fishing trips with less than 150 queen conch per trip. Also, fishing trips that landed 150 to 200 queen conch per trip were increased to 200 queen conch per trip. This was done under the assumption that these trips would adjust to the new regulation and reach the new trip limit. The range of trips with 150 to 200 queen conch was chosen to account for potential error from the crude conversion of pounds of queen conch to numbers. Trips that reported greater than 200 queen conch per trip were not changed since the catch from these trips exceeded both the present commercial trip limit in the EEZ and the newly proposed trip limit. The adjusted landings were combined with the landings from St. Croix (Territory) and unreported area landings to determine the percent change in the landings (Table 1.6.1). Based on these analyses, regulatory changes proposed by **Preferred Alternative 2** would result in very little impact on queen conch harvest patterns. The queen conch landings rate in St. Croix was predicted to increase by less than 1 percent if queen conch was assumed to be reported landed as uncleaned meat, or by 1.5 percent if queen conch was reported landed as cleaned meat (Table 2.2.1).

Alternative 3 would modify the trip limit for the commercial harvest of queen conch in the EEZ to allow no more than 150 queen conch per vessel per day if there is one licensed commercial fisherman on board, or no more than 200 queen conch per vessel per day if there is more than one commercial fisherman on board. This alternative would be partially compatible with the USVI as it sets the maximum number for harvest at 200 queen conch per vessel. The purpose of this alternative is to address the potential additional harvest that may occur if there is only one licensed fisherman on board, as would occur with **Preferred Alternative 2**. In **Alternative 3**, if only one licensed commercial fisher is on board, that fisher would only be allowed to harvest 150 queen conch, and this in theory would not have any potential negative effect on the rate at which the ACL is achieved (i.e., would not increase the rate). However, **Alternative 3** does not address potential issues that enforcement may encounter when only one licensed person is on board, as the USVI does not have that distinction in its regulations. Thus, **Alternative 3** does not address the stated purpose and need of this action.

To predict the impact of **Alternative 3** on total queen conch landings in St. Croix, queen conch landings for the three most recent fishing seasons in St. Croix (2009/2010, 2010/2011, and 2011/2012) (Table 1.6.2) were modified following the methods discussed in Section 1.6 of this document (e.g., to distinguish between fishing trips with different numbers of licensed

commercial fishermen) and predictions were based on the obtained results. In addition to the general methods discussed in Section 1.6, other modifications to the landings data were made to address specific questions from this alternative. Fishing trips determined to have more than one fisherman on board, and that exceeded 200 queen conch, were reduced to 200 queen conch per vessel. The trips that only had one fisherman were not modified because this represents the status quo. The adjusted landings were combined with the landings from the Territory and unreported area landings to determine the percent change in landings. This resulted in no change if the reported landings were assumed to be from uncleaned queen conch because none of the trips with more than one fisherman exceeded the 200 queen conch limit. When the reported landings were assumed to be from cleaned queen conch there was only one trip in the EEZ that exceeded the 200 queen conch limit (Table 1.6.4). Based on these analyses, regulatory changes proposed by **Alternative 3** resulted in very little impact on queen conch harvest patterns. The landings rate is not predicted to change if the pounds reported came from uncleaned queen conch, and will decrease by less than 1 percent if the landings came from cleaned queen conch.

Modifications to the EEZ trip limit proposed in **Preferred Alternative 2** and **Alternative 3**[2] are predicted to have very little impact on future landings toward the 50,000 lb quota, because most trips do not exceed the newly proposed trip/vessel limits. Table 2.2.1 summarizes the impact from each alternative. The small impacts expected from both alternatives are because landings in the EEZ in recent years represent only 28 percent of the overall St. Croix landings, and few of those trips included more than one licensed commercial fisher or brought home more than 150 queen conch. Queen conch trips from the EEZ that reported the range of 150 to 200 queen conch only represented 8 percent for uncleaned and 20 percent of cleaned queen conch of the EEZ reported landings. Therefore, changes made to the EEZ queen conch harvest to reflect changes in the trip limit impacted a small amount of the queen conch harvest, and would result in very little impact on landings.

Table 2.2.1. Percent change in the rate of approach to the St. Croix 50,000 lb queen conch landings quota expected from **Preferred Alternative 2** and **Alternative 3** of Action 1.

Action 1	***Uncleaned Queen Conch***	***Cleaned Queen Conch***
Preferred Alternative 2	<1% Increase	1.5% Increase
Alternative 3	No Change	<1% Decrease

[2] Analysis of **Preferred Alternative 2** and **Alternative 3** required details on the number of queen conch harvested per vessel. Queen conch per vessel were calculated by first determining trips that had the same vessel, date, and had more than one licensed commercial fisherman. The numbers of queen conch harvest on these trips were then summed to generate the harvest per vessel. Only 18 of these trips were identified inside the EEZ which provides a small sample size. The possibility exists that there were more queen conch trips that contained more than one licensed commercial fisherman but only one fisherman reported the landings. The small sample size and possibility of additional multiple fishermen on trips present the possibility that the results may not accurately reflect fishermen behavior. Regardless of whether queen conch were assumed to be landed as cleaned or uncleaned meat, impacts on harvest were minimal. However, if these conversion factors are not accurate then landings in numbers could be over- or under-estimated.

2.3 List of Alternatives for Action 2: Queen Conch Recreational Bag Limit in the U.S. Caribbean EEZ

ACTION 2: Modify the bag limit for the recreational harvest of queen conch in the U.S. Caribbean EEZ.

Alternative 1: **Preferred** No Action. Do not modify the current bag limit for the recreational harvest of queen conch in the U.S. Caribbean EEZ, which consists of three queen conch per person per day or, if more than four persons are on board, 12 queen conch per vessel per day.

Alternative 2: Modify the bag limit for the recreational harvest of queen conch in the U.S. Caribbean EEZ to be consistent with the USVI territorial limit of six queen conch per person per day, with a maximum of 24 queen conch per vessel per day.

Alternative 3: Modify the bag limit for the recreational harvest of queen conch in the U.S Caribbean EEZ to allow no more than six queen conch per person per day, with a maximum of 12 queen conch per vessel per day.

Alternative 4: Modify the bag limit for the recreational harvest of queen conch in the U.S. Caribbean EEZ to allow no more than three queen conch per person per day, with a maximum of 24 queen conch per vessel per day.

Discussion

Similar to Action 1, Action 2 would apply to the whole U.S. Caribbean EEZ but would only affect the EEZ management subzone of St. Croix, which is the only area in federal waters where fishing for queen conch is currently allowed. The purpose of this management action is to consider alternatives that may aid enforcement efforts in federal and USVI territorial waters by modifying the recreational bag limit for the harvest of queen conch in federal waters. The current recreational bag limit in federal waters is three queen conch per person per day, and if four or more persons are on board, then a maximum of 12 queen conch per vessel per day. This daily bag limit is stricter than the daily limit in USVI waters, which consists of six queen conch per person with a maximum of 24 per vessel. The current bag limit in the USVI was established before the Council established harvest limits for the queen conch in the EEZ. At the time, the

USVI chose a quantity that was considered reasonable based on recreational/personal use in the USVI Territory. It appears recreational fishing for queen conch in the EEZ (Lang Bank, St. Croix) is minimal, as it mostly occurs in territorial waters. However, the USVI has expressed interest in having federal waters become compatible with the territorial recreational bag limit to aid enforcement because some of the harvest of queen conch in St. Croix may come from the EEZ. Current recreational limits in federal waters are lower than in territorial waters, thus traversing through territorial waters would not create an enforcement problem like in Action 1 (commercial), as harvest would still be within the limits allowed in territorial waters. Nevertheless, the lack of compatible recreational regulations could make it difficult to enforce the federal bag limit because once queen conch is landed, there is no way of determining where the queen conch have been harvested.

Concern about changing the federal recreational bag limit was brought up at various Council meetings in the past. Queen conch is classified as an overfished species and has an established rebuilding plan (NMFS Status of U.S. Fisheries 2012), and an increase in harvest may not ensure the continued health of the resource. Additionally, there is currently no monitoring of recreational harvest for queen conch in the USVI.

Biological management reference points (maximum sustainable yield (MSY) proxy and an overfishing limit (OFL)) were estimated in the 2010 Caribbean ACL Amendment for queen conch for the U.S. Caribbean, and are based solely on commercial landings (CFMC 2011a). The MSY proxy for the U.S. Caribbean was estimated to be 512,718 lbs, and it does not take into account recreational harvest (CFMC 2011a; Section 3.2.3 of this document). The U.S. Caribbean OFL was defined as the amount of landings corresponding to the MSY proxy. The U.S. Caribbean OFL includes an explicit and known harvest commercial component, and an unknown but implicit, recreational catch. The ACLs for the U.S. Caribbean were estimated based on the OFL (which equals the MSY). ACLs of zero were established for federal waters surrounding St. Thomas/St. John and Puerto Rico, as harvest has been prohibited in those federal waters since 2005. For the St. Croix management area, which is the focus of the present regulatory amendment, the allowable harvest of queen conch from St. Croix territorial and federal waters combined is 50,000 lbs (ACL/quota) and this was based on commercial landings. This ACL quota, which guides queen conch harvest in the EEZ, serves as a proxy for the harvest that is occurring in both the commercial and recreational sectors of the fishery. When total commercial harvest reaches that level and the USVI closes territorial waters off St. Croix to the harvest and possession of queen conch, NMFS will concurrently close the St. Croix EEZ to the harvest and possession of queen conch. Because there is no data on recreational harvest, the recreational harvest season for queen conch in St. Croix territorial and EEZ waters follows that of the commercial harvest season. When the commercial quota is reached, harvest for both the commercial and recreational sectors is closed and will remain closed until the next fishing season for territorial waters opens on November 1.

The established ACL is assumed to be sufficient to prevent overfishing from occurring. Therefore, modifying the total recreational bag limit, to meet the purpose and need of this action, could potentially change the balance that was used to establish the ACL for the St. Croix management area. The absence of an explicit recreational harvest quota has the potential for recreational harvesters to harvest at a more rapid rate thereby increasing total harvest to an undefined degree. The current status of the queen conch may not justify an increase in total harvest.

Preferred Alternative 1 is the no action alternative and would not change the current recreational bag limit in the EEZ as established by the Queen Conch FMP in 1996. **Preferred Alternative 1** would not achieve compatibility with USVI regulations and although the current federal bag limit is within the limits allowed in territorial waters, it would offer no resolution to the current enforcement issues. Thus, compatibility could only be achieved if the territorial government revised their recreational bag limit to be consistent with the federal bag limit. **Preferred Alternative 1** has the added advantage of supporting the queen conch rebuilding plan because it would constrain the recreational harvest at a lower daily harvest rate. Because there is no cap (i.e., quota) for the total recreational harvest, and no tracking of recreational queen conch harvest in the U.S. Caribbean, this daily harvest constraint is the only presently functional constraint on recreational harvest.

Alternative 2 would modify the current federal recreational daily bag limit to be compatible with the USVI. The federal bag limit would be increased to be consistent with the USVI limit of six queen conch per person per day, with a maximum of 24 queen conch per vessel per day (Table 2.3.1). Having a compatible recreational bag limit could aid in enforcement of regulations and would be consistent with the purpose and need of this action. In territorial waters, although there is no data regarding the number of pounds of queen conch harvested recreationally, it has been suggested that these values may be higher than what the current USVI recreational bag limit allows. However, this information cannot be corroborated because there is no recreational landing monitoring program in territorial or EEZ waters. **Alternative 2** allows for a more rapid rate of daily recreational harvest, with no constraint on total harvest. As a result, to the degree that recreational harvest occurs in EEZ waters, this alternative may allow for an overall increase in the annual take of queen conch from USVI waters. Potentially negative biological effects could be realized from this alternative, for example if doubling the amount of recreational harvest results in overfishing of the queen conch and compromises stock rebuilding efforts.

Alternative 3 would establish a daily bag limit of six queen conch per person and a maximum of 12 queen conch per vessel. This alternative is partially compatible with the USVI territorial bag limit in the number of queen conch that can be harvested per person. **Alternative 3** would put a

cap on the daily harvest per vessel by limiting that number to 12 queen conch, which is identical to the current recreational limit in federal waters. If only one person per vessel is fishing, under **Alternative 3** that person would be doubling the allowed harvest from what is currently allowed by federal regulations. However, if there are two persons on board, the maximum would still be 12, consistent with the current recreational limit in the EEZ (Table 2.3.1). Though, that maximum daily limit would now be available to two fishers rather than requiring four fishers. **Alternative 3** was proposed as an option that would keep the allowed harvest per vessel to an adequate minimum (e.g., a lower minimum), while still being partially compatible with USVI regulations.

Alternative 4 would establish a daily bag limit of three queen conch per person and a maximum of 24 per vessel. This alternative is also partially compatible with USVI territorial limits, because it sets the total daily bag limit per vessel at 24 queen conch. **Alternative 4** sets an individual limit of three queen conch instead of the six queen conch proposed in **Alternative 2**. Although this alternative has a higher vessel limit, the restriction on fishing per person would contribute to lessening the daily take because for the maximum to be harvested, it would need eight persons on board, and that would depend on the fishery practices of the sector, which are mostly unknown (Table 2.3.1). **Alternative 4** was proposed as an option that would keep the allowed harvest per person to a minimum, while still being partially compatible with USVI regulations.

Table 2.3.1. Number of queen conch that can be harvested per recreational fisher per vessel under each of the proposed alternatives for Action 2. The shaded cells represent the instances where the number of queen conch that could be fished would be higher than what is currently allowed (status quo).

Alternatives	**Number of Recreational Fishers/Vessel**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**> 8**
1	3	6	9	12	12	12	12	12	12
2	6	12	18	24	24	24	24	24	24
3	6	12	12	12	12	12	12	12	12
4	3	6	9	12	15	18	21	24	24

Chapter 3. Affected Environment

The actions considered in this regulatory amendment would affect the U.S. Caribbean exclusive economic zone (EEZ) of the management area of St. Croix in the U.S. Virgin Islands (USVI). This section describes the affected environment in the proposed project area.

The affected environment is divided into four major components:

- **Physical / Habitat environment** (Section 3.1)

  Examples include geology, climate, and habitat (essential fish habitat)

- **Biological environment** (Section 3.2)

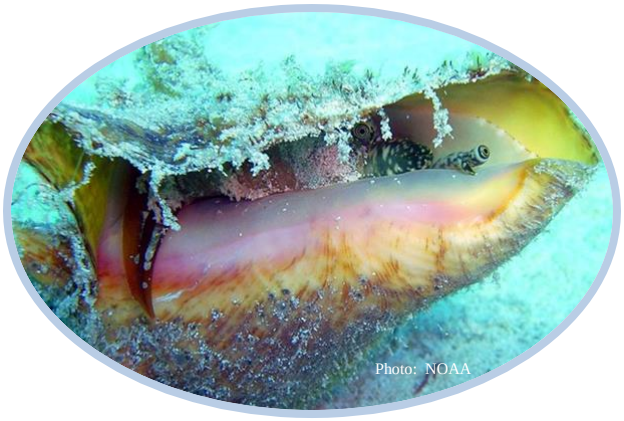
  Examples include biology and ecology of the queen conch, description and status of the fishery, protected species.

- **Human environment** (Section 3.3)

  Examples include fishing communities and economic description of the fishery

- **Administrative environment** (Section 3.4)

  Example includes the fishery management process



3.1 Physical Environment

The physical and geological environments of the U.S. Caribbean were described in detail in the Generic Essential Fish Habitat (EFH) Amendment to the Fishery Management Plans (FMPs) of the U.S. Caribbean and in the EFH Final Environmental Impact Statement (EFH-FEIS) (CFMC 1998, 2004), and is incorporated herein by reference, and 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 U.S. Virgin Islands (USVI) in the Lesser Antilles island chain (Figure 3.1), both of which separate the Caribbean Sea from the western central Atlantic Ocean.

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 mi^2 (347 km^2) of land area (Catanzaro et al. 2002).

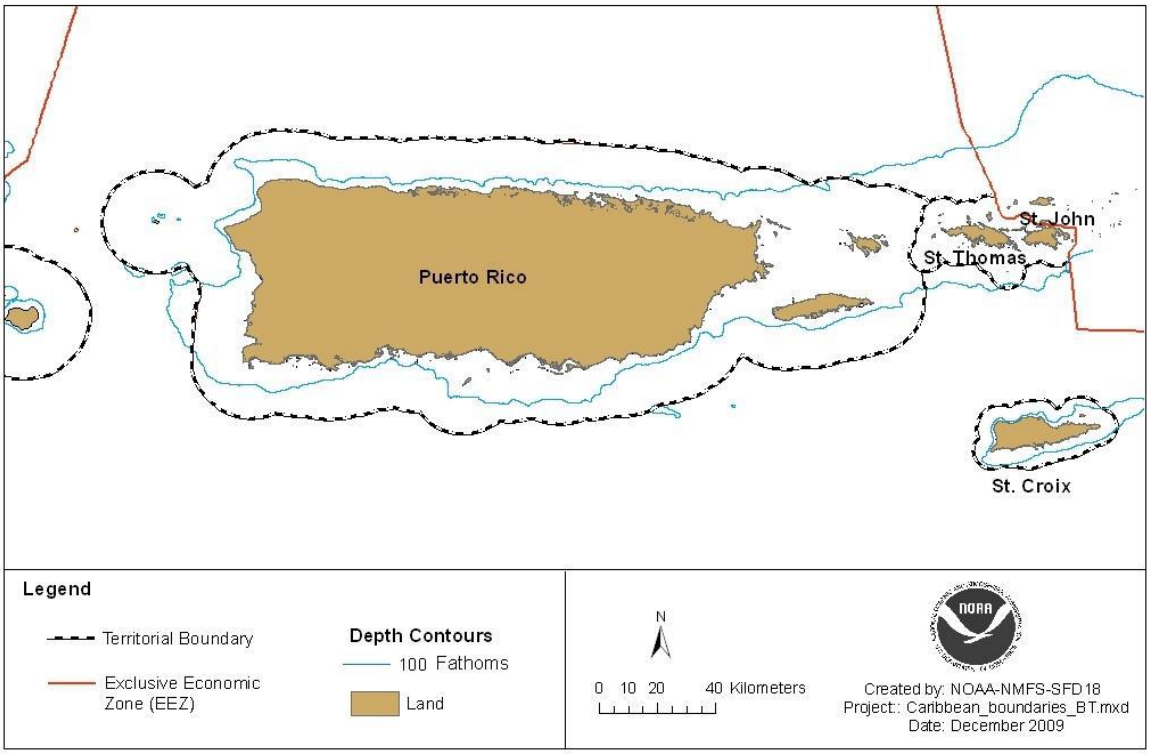


Figure 3.1. Location of Puerto Rico and the U.S. Virgin Islands.

The island of St. Croix is located about 46 mi (74 km) south of St. Thomas and St. John (CFMC 2004). Covering about 80 square miles (mi^2) (207 km^2), 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 mi^2 (83 km^2) and 20 mi^2 (52 km^2) (Catanzaro et al. 2002).

3.1.1 Geology

Section 3 of the EFH-FEIS (CFMC 2004), provides detailed information on the geology of the U.S. Caribbean and is incorporated herein by reference.

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 3.1.1.1). The shelf shared by the islands of St. Thomas and St. John has an area of approximately 510 nm^2 (1751 km^2) 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 nm^2 (343 km^2) (references in Gordon 2010) with most of the shelf less than 80 ft (24.4 m) deep (Kojis and Quinn 2012) (Figure 3.1.1.2).

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 (BVI). 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 3.1.1.1).

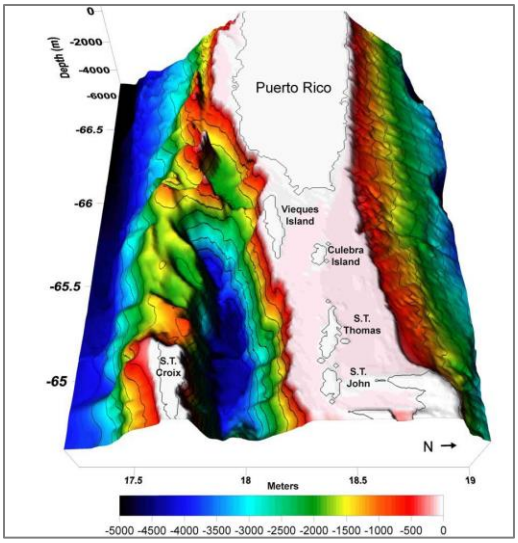


Figure 3.1.1.1. Shared platform between the east coast of Puerto Rico and St. Thomas/St. John. The deep trough between the Puerto Rico/St. Thomas/St. John platform and St. Croix is clearly seen in this graphic representation of depth (Source: García-Sais et al. 2005).

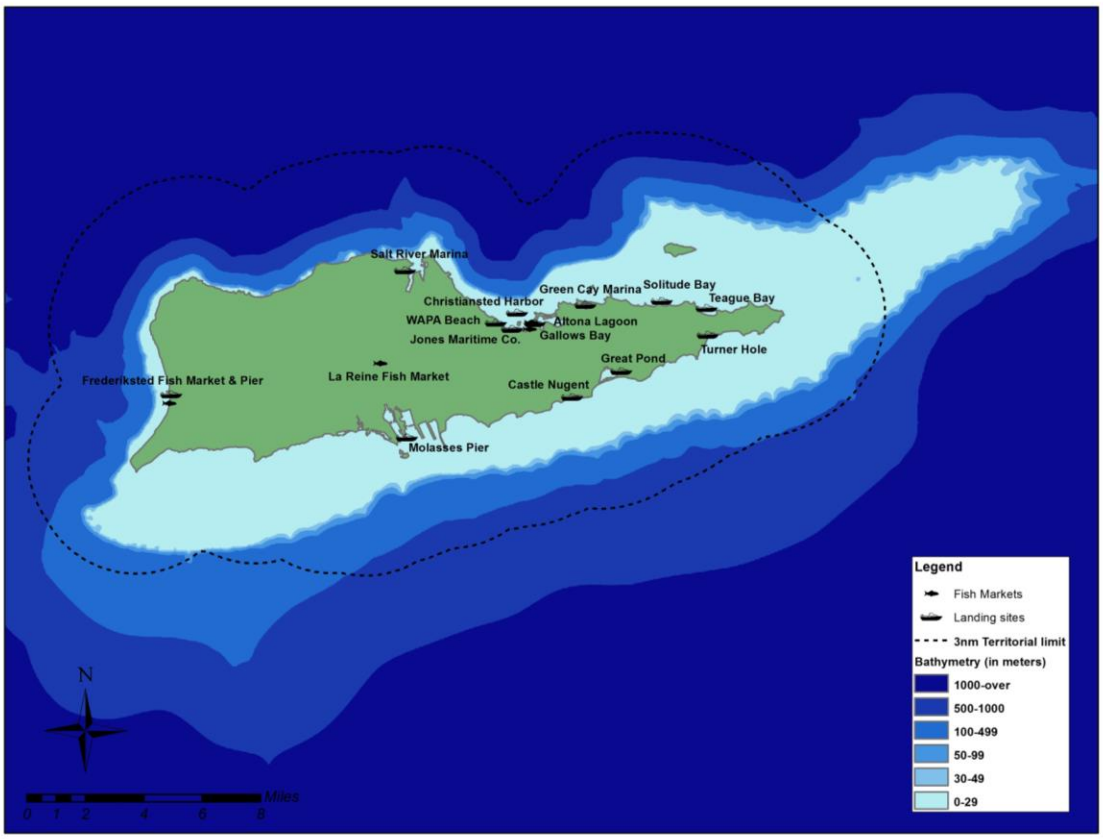


Figure 3.1.1.2. Map of the island of St. Croix, USVI showing the bathymetry around the island (Source: Kojis and Quinn 2012).

3.1.2 Oceanography and Climate

The oceanography and climate of the U.S. Caribbean is described in detail in the EFH-FEIS (CFMC 2004), Section 5.1.2 of the Comprehensive Sustainable Fisheries Act (SFA) Amendment (CFMC 2005), and in DPNR 2005, and is incorporated herein by reference, and summarized below.

The Caribbean Current flows about 62 mi (100 km) south of the U.S. Caribbean islands at an average speed of 0.5 to 1 knots (0.3 - 0.5 m/second). The current is characterized by large cyclonic and anticyclonic gyres. Its strength is influenced by changes in the position of the inter-tropical convergence zone (ITCZ) (CFMC 2004). The zonal shift of the ITCZ is also responsible for the seasonal change in precipitation in the Caribbean. The dry season occurs when the ITCZ is near the equator, generally in the late winter to spring. The wet season occurs when the ITCZ

is at its most northerly position in the Caribbean, generally in the late summer into late fall (CFMC 2011a and references therein).

In the USVI, the average air temperature is warm (24° to 27° C (75.2° to 80.6° F)) with little daily or annual variation (DPNR 2005). The small temperature fluctuation is a result of fairly constant seawater temperatures and small island land masses. The warmest water temperatures occur in August and range from 27° to 28° C (80.6° to 82.4° F). February is the coldest month, and temperatures range from 25° to 26° C (77.0° to 78.8° F) (DPNR 2005 and references therein).

In the USVI, winds are typically steady and out of the northeast (the Trade Winds), averaging about 7.8 knots (4 m/second) (Calvesbert 1970 in DPNR 2005). Surface currents and waves are driven by the predominant Trade Winds and therefore, generally flow from east to west (the North Equatorial Current). Nearshore flow patterns, however, may be more complex because of local physical features, semidiurnal and diurnal tidal cycles (mean tidal range 0.80 to 0.98 ft (0.24 to 0.30 m)), and local wind patterns (IRF 1985 in DPNR 2005). No upwelling is thought to occur around these islands, except possibly during strong tropical storms or hurricanes (DPNR 2005).

Queen conch (*Strombus gigas*) larvae remain as zooplankton for 16 - 28 days. It is likely that a portion of these larvae are dispersed long distances, while others may be trapped in current eddies, and transported back to their natal habitat (Gordon 2010 and references therein). Delivery of larvae to viable queen conch nursery areas can also depend on strong tidal currents (Stoner and Ray 1996 in Gordon 2010). It has been suggested that recruitment in the northern USVI, where the predominant water currents flow east to west, may be linked to the reproductive success of queen conch in the BVI, and that this recruitment may be a result of the effective management of the queen conch fishery in the BVI (Gordon 2005). In St. Croix, an oceanic island separated by a deep water trench, commercial fishers report that current reversals are common and may occur one or more times daily. These current reversals may be due to the presence or absence of surface current-generating weather systems in combination with the lunar cycle (Gordon 2010). St. Croix may recruit queen conch larvae from other nearby gene pools (Saba Bank to the east, Anguilla and the BVI to the north, Puerto Rico to the west), as well as assist in replenishing its own queen conch population (Tobias 2005). It has been suggested that recruitment of queen conch larvae on St. Croix may be strongly related to eddie entrainment and transport back to the island platform (Gordon 2010).

The USVI lie within the broad path of Caribbean hurricanes, which typically pass from the southeast to the northwest (DPNR 2005). Hurricanes and large tropical storms can occur from June to December. These can cause physical damage to nearshore habitats, especially coral

reefs, as well as damage to coastal areas by producing heavy rainfall, which washes sediments and pollutants into those areas ((DPNR 2005 and references therein).

Additional information regarding the oceanography and climate of the USVI can be found in DPNR 2005.

3.1.3 Major Habitat Types

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 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.

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 mi^2 (5,494 km^2) of total bottom area mapped from aerial photographs, including submerged aquatic vegetation (SAV) (i.e., seagrass and algae), preferred habitats for queen conch. This total included both Puerto Rico (1,934 mi^2 (5,009 km^2)) and the USVI (187 mi^2 (485 km^2)), and covered from the shore line to about 66 ft (20 m) depth.

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

Armstrong et al. (2006) estimated that, of the total amount of benthic area mapped, 43.3 percent is between 100 and 328 ft (30 - 100 m). Very little of this area has been surveyed. Of the total benthic area mapped, 22.8 percent includes depths of less than 164 ft (50 m) (CFMC 2013), which is potential habitat for queen conch.

Queen conch occurs throughout the Caribbean and into the Gulf of Mexico, south Florida, the Bahamas, and Bermuda. Queen conch are found in shallow, clear water of oceanic or near-oceanic salinities at depths generally less than 246 ft (75 m), more often in water less than 98 ft (30 m) deep, being most likely limited to that depth range by limits in seagrass and algae cover.

Recently, reproductive queen conch populations have been found in deep water habitats of western Puerto Rico, at depths in the range of 98 - 164 ft (30 - 50 m) (J. García-Sais, CFMC Scientific and Statistical Committee (SSC) Meeting Transcript, March 14-15, 2012) (Figure 3.1.3.1). It has been suggested that deep water queen conch stocks may be critical to maintain spawning stocks in shallow areas (Prada et al. 2008; CFMC SSC Meeting Transcript, March 14-15, 2012). Seagrass meadows, coral rubble, algal plains, and sandy substrates are the preferred habitats (NMFS 2007).

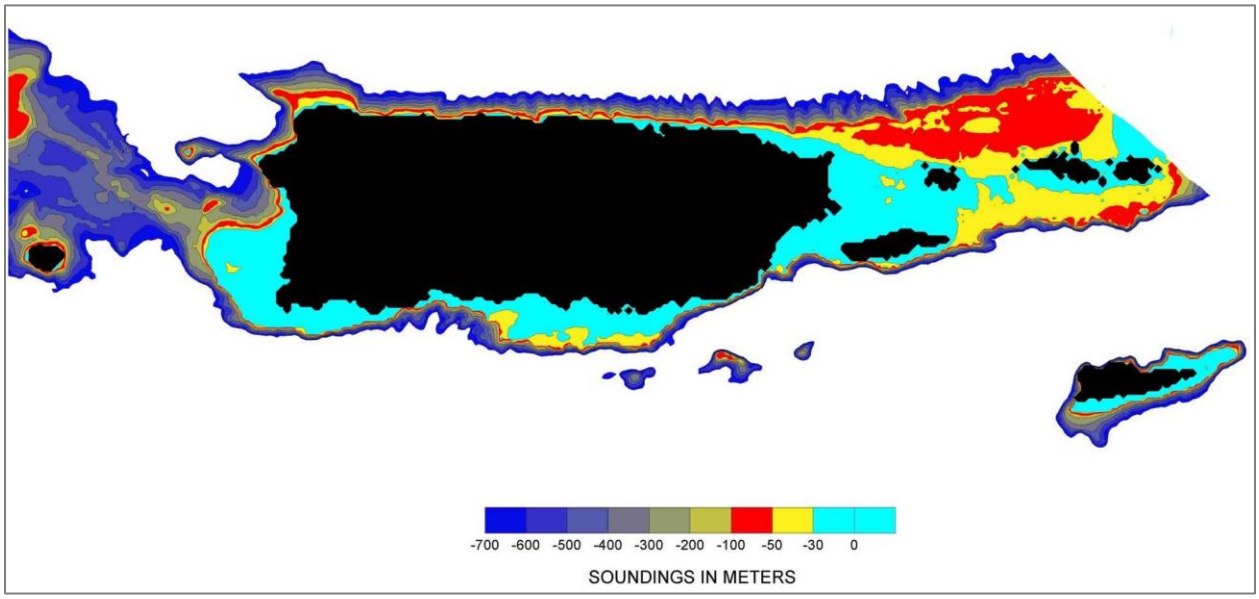


Figure 3.1.3.1. Bathymetric map of U.S. Caribbean nearshore waters; only waters to about 98 ft (30 m) are currently being fished for queen conch, although viable adult queen conch are reported to depths of 164 ft (50 m) (García-Sais 2012) (Sources: Jorge Sabater (personal communication in CFMC 2013); Armstrong et al. 2006; García-Sais 2005; Cimo et al. 2012).

The most important nursery habitats appear to be determined by complex interactions of physical oceanographic features, seagrass and algal communities, and larval delivery patterns (Stoner 1996 in Tobias 2005). After spending 18 - 40 days in the water column, queen conch settle in shallow, subtidal habitats where they spend much of their first year buried in sediment (CFMC 1996a; CFMC, CFRAMP 1999; references in CFMC 2005). Some studies have documented that after settlement, young queen conch move into nearby seagrass beds (references in CFMC 2005). Larger juvenile queen conch generally leave nursery areas and migrate into deeper water (references in CFMC 2005). A shift in distribution occurs when reproductive individuals move inshore to spawn in the warmer months and then return to deeper waters in October (references in CFMC 2005).

Queen conch habitat in the USVI

The USVI contains a variety of habitats including fringing and patch reefs, mangrove lagoons, seagrass beds, consolidated pavement (e.g., hard grounds), sand plains, and algal plains (Dammann and Nellis 1992 in Gordon 2010). Algal plains, sandy bottoms dominated by algae, are the predominant benthic habitat in the USVI, covering most of the non-reef areas deeper than 66 ft (20 m) (Homes 1978 in DPNR 2005). In the USVI, available queen conch habitat is mostly limited to waters of the surrounding shallow insular shelf platform (Appeldoorn 1987 in Gordon 2010). Despite a smaller shelf platform, the majority of queen conch landings in the USVI are recorded from St. Croix (Tobias 1987, Garcia-Moliner 1997, Tobias et al. 2000, in Gordon 2010).

Fishing for queen conch is principally conducted by free diving and SCUBA diving, and the shallower St. Croix shelf allows easier access for divers (Gordon 2010; Kojis and Quinn 2012). In St. Croix, the shelf area does not extend far from the shoreline (<3 nm (<5.6 km)), and the shelf depth in that area ranges from 20 to 79 ft (6 to 24 m). This is the depth range where juvenile and sub-adult queen conch are primarily found (Schweizer and Posada 2006, in Gordon 2010). The St. Croix shelf supports more queen conch per hectare (1 hectare = 0.004 mi^2) than St. Thomas and St. John, possibly because of the increased availability of their primary food source (algae) on St. Croix's shallow shelf (Kojis and Quinn 2012).

Seagrass beds and algal plains provide habitat to both adult and juvenile queen conch (Gordon 2002). Southeast Area Monitoring and Assessment Program in the Caribbean (SEAMAP-C) sampling for queen conch in the USVI conducted from 2000-2001 to indicate trends in the stock conditions over time around each USVI island, ranked pavement and algae as the most abundant habitat types encountered around St. Croix (Gordon 2002). In the same report, algal habitats in St. Croix were found to have the highest mean density of queen conch (113.5 queen conch/ha), followed by seagrass (94.0 conch/ha), and then pavement (25.3 queen conch/ha). Juvenile queen conch were also more abundant on algal plains and seagrass beds than other benthic habitats. Juvenile queen conch in the surveyed sites of St. Croix were found to be most abundant in the 23 - 39 ft (7 - 12 m) and 43 - 59 ft (13 - 18 m) depth strata, whereas adult density was highest in the 62 - 79 ft (19 - 24 m) depth stratum.

A follow up SEAMAP-C study, conducted in USVI waters from 2008-2010, reported the highest adult queen conch abundances and densities in seagrass habitat for St. Croix, St. Thomas, and St. John (Gordon 2010). While St. Thomas and St. John waters supported highest juvenile densities (316.8 juv/ha and 150.6 juv/ha, respectively) in seagrass, highest juvenile density was found in sand habitat (261.5 juv/ha) in St. Croix waters (Gordon 2010). In the 2010 report, and consistent with the 2001 survey results (Gordon 2002), for St. Croix, Gordon (2010) again reported highest juvenile densities in the 23 - 39 ft (7 - 12 m) and 43 - 59 ft (13 - 18 m) depth ranges, whereas

adults were most abundant at the deepest surveyed depths of 82 - 98 ft (25 - 30 m). In this 2010 study, sites in the federal portion of Lang Bank exhibited a total density of 83.5 queen conch/ha which were comprised entirely of adults due to a deeper depth stratum 82 – 98 ft (25 - 30 m). Higher adult queen conch abundance in deeper waters could be a consequence of gradual offshore migration with increasing age coupled with intense fishing mortality in shallow waters (Stoner and Sandt 1992, Stoner and Ray 1996, Stoner et al. 1996, in Gordon 2010).

In summary, although queen conch densities varied by habitat type and between survey years (Gordon 2010), algae and seagrass consistently rank as the most important habitats for queen conch of different life stages, showing the importance of vegetative material as queen conch habitat. In St. Croix, queen conch densities also increased considerably from previous years in the habitats of coral/pavement, rubble, and sand (Gordon 2010). Overall, density by depth from the 2010 and other previous studies, seems to indicate that juvenile queen conch prefer shallower areas, while adults prefer deeper areas (Gordon 2010).

3.1.3.1. Major Habitat Types in Lang Bank, St. Croix

The eastern shelf of St. Croix extends offshore for about 12.4 mi (20 km) and averages 66 to 98 ft (20 to 30 m) deep (Goenaga and Boulon 1991). Lang Bank is described as a submerged reef complex that rises to about 33 ft (10 m) in depth along the seaward edge of St. Croix's eastern shelf (Goenaga and Boulon 1991). The bank is mostly cemented pavement (e.g., hard grounds) with scattered sponges, gorgonians, and coral heads, dominated by *Porites* spp., *Diploria* spp., *Montastraea* spp., and *Acropora cervicornis* (Goenaga and Boulon 1991). The majority of Lang Bank is flat and shallow, with coral textures present. An outer barrier reef is present before the drop off, creating a basin-like formation inside, which is up to 180 ft (55 m) deep in places (GPR 2003).

A federally managed marine protected area (MPA) lies on the outer edge of Lang Bank, at approximately 9 mi (14 km) from the easternmost tip of St. Croix (the delimitation of the MPA and depth contours are shown in Figures 3.1.3.1.1 and 3.1.3.1.2, respectively). The MPA Inventory of the National Marine Protected Areas Center has this MPA listed as the Red Hind Spawning Aggregation Area East of St. Croix, which covers an area of approximately 11.63 nm^2 (39.9 km^2) (http://www.mpa.gov/dataanalysis/mpainventory/, June 2012), with 7.47 nm^2 (25.7 km^2) consisting of waters less than 100 fathoms (600 ft (183 m)) deep (CFMC 2005). This area covers about three percent of the fishable habitat in EEZ waters off the USVI, and about 2 two percent of the total fishable habitat in the EEZ (CFMC 2005). The Lang Bank area MPA was established in 1993 and is seasonally closed to all fishing from December 1 through the last day of February each year (50 CFR 622.23) for protection of the red hind grouper spawning aggregation in this area. To minimize the adverse impacts of fishing on essential fish habitat, in

2005 a final rule banned the use of traditional gear (e.g., traps, pots, gillnets, trammel nets, and/or bottom longlines) year-round within the MPA, which applies to all fisheries, including pelagic fisheries such as swordfish, tuna and shark (70 FR 62073).

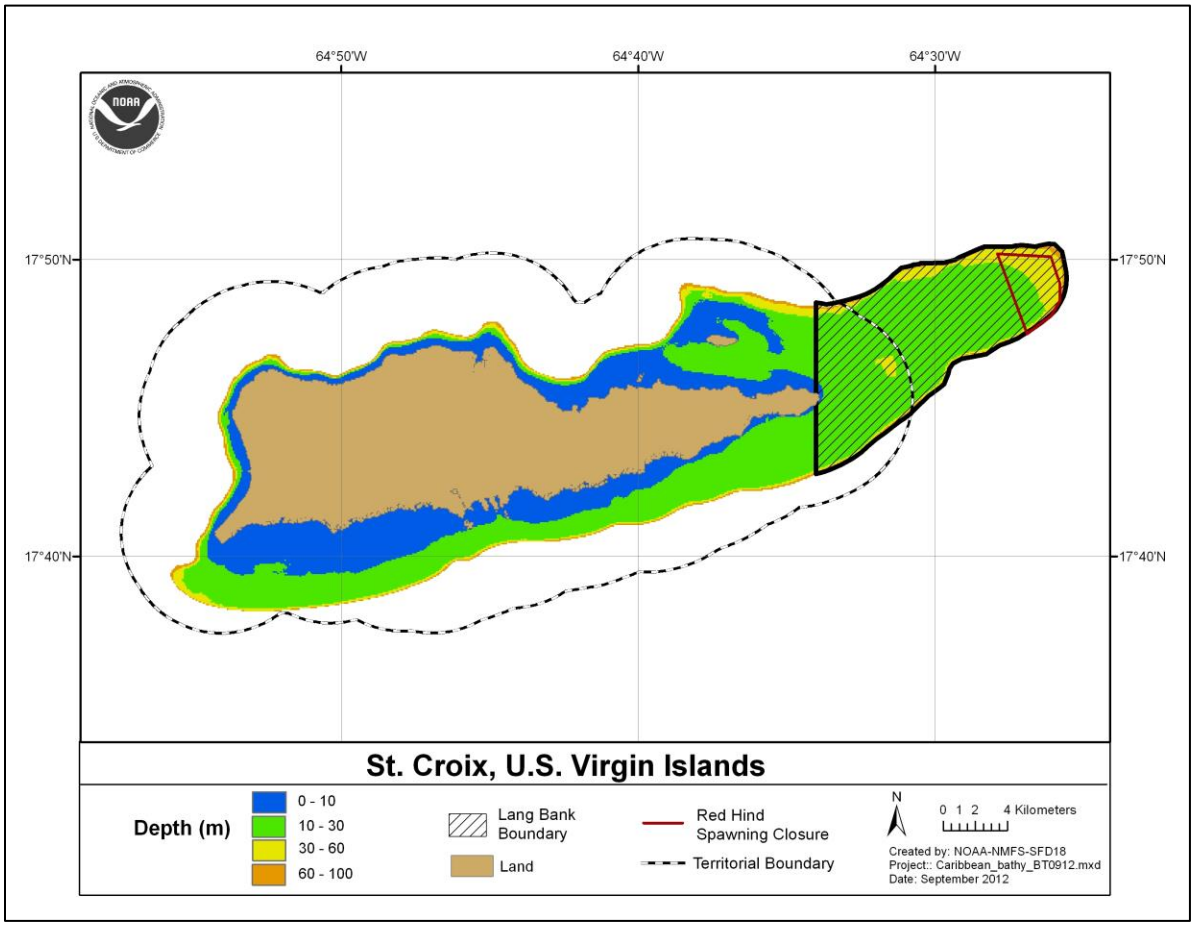


Figure 3.1.3.1.1. Bathymetric map of the island of St. Croix, USVI showing the boundaries of the Lang Bank area (heavy black line) within territorial and federal waters, as well as the Marine Protected Area for the spawning aggregation of the red hind grouper within federal waters of the Lang Bank.

The closed fishing area fringes the shelf edge and includes a deep outer shelf basin with mesophotic (i.e., deep-water) terraces and ridges (García-Sais 2012). Prada (2003) produced a benthic map of the Lang Bank area MPA. Soft corals (e.g., gorgonian plains) were reported as the dominant benthic habitat type, representing nearly 70 percent of the total area surveyed (García-Sais 2012; GPR 2003). There are at least five distinct reef physiographic zones. These include 1) an inner shelf-break and slope with what appears to be a spur-and–groove reef formation distributed at depths between 82 - 131 ft (25 - 40 m); 2) a mostly flat, gently sloping basin at depths between 147 - 184 ft (45 - 56 m); 3) a ridge that rises from the deep basin to

variable heights; 4) the inner slope wall of the outer shelf break; and 5) an outer shelf-edge that breaks at about 82 - 98 ft (25 – 30 m) and drops abruptly to a narrow terrace at about 328 ft (100 m) (García-Sais 2012).

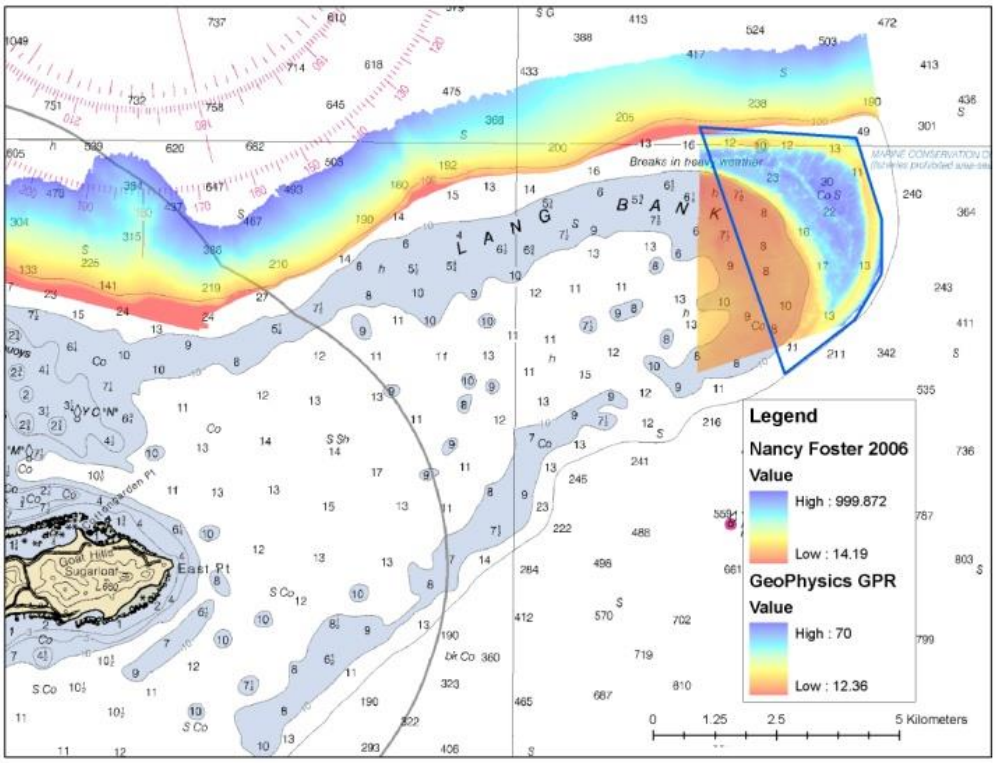


Figure 3.1.3.1.2. Location of the MPA (blue line) within the Lang Bank area on the east coast of St. Croix, including side scan sonar/multi-beam bathymetry (Source: GPR 2003).

In GPR (2003), 72 percent of the benthic habitat in the Lang Bank area MPA was defined as consolidated habitat, 27 percent was described as unconsolidated habitat, and 1.2 percent was defined as SAV (Table 3.1.3.1.1 and Figure 3.1.3.1.3).

Table 3.1.3.1.1. Geomorphology of benthic habitat areas in square meters (m^2) for the MPA within Lang Bank (LB) based on side scan sonar imagery from GPR 2003 in the categories of consolidated habitat, submerged aquatic vegetation (SAV), and unconsolidated habitat.

Sum of AREA	**SITE**						
GEOMORPH	**LB-1**	**LB -2**	**LB-3**	**LB-4**	**LB-5**	**LB-66**	**Grand Total**
Consolidated	1,060,885.1	33,857.9	2,864,330.2	699,002.1	1,639,090.3	265,445.7	6,562,611.4
SAV	6,942.3	4,012.6	0	0	0	0	10,954.9
Unconsolidated	446,510.1	150,364.9	504,769.2	611,334.3	346,755.9	386,024.8	2,445,759.1
Grand Total	1,514,337.5	188,235.4	3,369,099.4	1,310,336.4	1,985,846.2	651,470.5	9,019,325.4

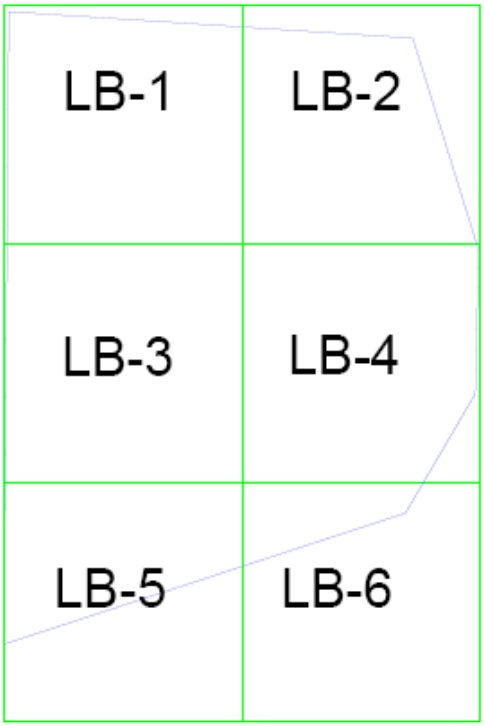


Figure 3.1.3.1.3. Representation of the areas surveyed by GPR (2003) within the MPA boundary in Lang Bank (blue line represents mapping boundaries). LB-1 through LB-6 represent areas surveyed in the benthic habitat of the MPA, as described in Table 3.1.3.1.1 above (Data source: GPR 2003).

3.1.3.2. 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. EFH 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.

For specific life stages of estuarine dependent and near-shore fish and invertebrates, EFH includes areas from the outer boundary of the EEZ (or the 100 fathom (600-ft) contour line, whichever is greater) to the mean high water limit line, and includes habitats such as attached macroalgae, submerged rooted vascular plants (seagrasses), estuarine emergent vegetated wetlands, tidal creeks, estuarine scrub/shrub (mangrove fringe), shell banks, unconsolidated bottom (soft sediments), coral reefs, and live/hard bottom. Empty queen conch shells in these habitats provide refuge and attachment substrate for other invertebrates and fish in their juvenile and adult stages. Thus, empty queen conch shell also provides EFH for other species.

Queen conch is mostly harvested by hand and this results in a minimum adverse effect to EFH. Any of these effects are the result of the fishing action when attempting to remove the shell where it is found, and placing the shell in a basket or collecting bag for eventual lifting to the vessel when in federal waters. If the queen conch happens to be a female, rarely does a fisherman find them in the act of laying eggs in the sediment, but it does happen, and this can be considered another consequence of harvesting. Careless divers could impact invertebrate organisms close to the queen conch targeted for harvest, such as gorgonians, sponges or corals, but usually these effects are minor, and most commercial queen conch divers are experienced and attempt to avoid these situations to minimize risk of injury to themselves and to EFH.

3.1.3.3. Habitat Areas of Particular Concern

There are no habitat areas of particular concern (HAPC) listed under the Council's Queen Conch FMP. However, areas that meet the criteria for HAPCs for species in the Corals and Reef Associated Plants and Invertebrates FMP and the Reef Fish FMP, also provide EFH that is used by queen conch. As a consequence, queen conch benefit from the additional protections provided to HAPCs.

In addition to protecting habitat from fishing related degradation though FMP regulations, the Council, with guidance from its Advisory Panel and Scientific and Statistical Committee, consults on any relevant habitat issues.

3.2 Biological Environment

3.2.1. Biology and Ecology of the Queen Conch (*Strombus gigas*)

This section summarizes the available information on the biology and status of the queen conch. Descriptions of the queen conch fishery management unit are provided in detail in the Queen Conch FMP (CFMC 1996), in the Generic EFH Amendment (CFMC 1998), and in Regulatory Amendment 1 to the Queen Conch FMP (CFMC 2010), and are incorporated herein by reference.

The Queen Conch FMP, as last amended in 2011 (Amendment 3 to the Queen Conch FMP (CFMC 2011b)), is currently composed of the queen conch, *Strombus gigas* (CFMC 1996). The queen conch is a large marine gastropod found in the Caribbean Sea and the Western Atlantic, ranging from Bermuda to northern Brazil (Valle-Esquivel 2002a in Tobias 2005). The queen conch has a soft body with a hard, external, calcium carbonate shell. They are prized as both a soft, edible meat, and for their attractive shell (NMFS Office of Protected Resources, http://www.nmfs.noaa.gov/pr/species/invertebrates/queenconch.htm). This species is harvested by both commercial and recreational sectors.

Queen conch are benthic grazers and are commonly found on sandy bottoms that support the growth of seagrasses, primarily turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), shoal grass (*Halodule wrightii*), and epiphytic algae upon which it feeds (CFMC 2005). This species can also occur on gravel, coral rubble, smooth hard coral or beach rock bottoms, and sandy algal beds (CFMC 1996). Queen conch can be found in depth ranges from shallow subtidal waters to generally less than 246 ft (75 m) deep (CFMC 2005). Queen conch densities decrease significantly below 98 ft (30 m) due to light limitations for plant growth (Randall 1964 in Tobias 2005).

3.2.1.1. Queen Conch Growth

Adult queen conch grow to 15 - 30.5 cm (6 - 12 in) in length (CFMC 1996a), weigh about 2 kg (4.4 lb), on average, and can live up to 30 years. They are thought to have low rates of natural mortality, but few studies have examined this question (Glazer, pers. comm. in NMFS 2007, Ehrnhardt and Valle-Esquivel 2008). The species has determinate growth and reaches

maximum shell length before sexual maturation (Stoner et al. 2012c). Subsequent, growth occurs primarily through the thickening of the shell, especially at the lip (CFMC/CFRAMP 1999 in CFMC 2005). Shell thickness, including thickness of the shell lip, increases with age because nacre is continuously deposited on the inside of the shell, resulting in the reduced internal space for soft tissue (Randall 1964 in Stoner et al. 2012c). The interior volume of the shell decreases with age such that very old individuals have significantly smaller body size (CFMC/CFRAMP, 1999 in NMFS 2007). Shell length may also decrease in older individuals due to erosion of the shell. Queen conch are difficult to accurately age. Shell length provides some indication of age until the approach of sexual maturity and the appearance of the shell flare, as discussed below. Lip thickness has been used to age adult conch, at least relatively (Appeldoorn 1988a, CFMC/CFRAMP 1999, in NMFS 2007; Stoner et al. 2012c). In the U.S. Caribbean and other Caribbean areas where queen conch is harvested, shell length (from the tip of the spire to anterior edge of the shell) and lip thickness are commonly used to determine minimum size for harvest.

3.2.1.2. Queen Conch Shell Morphology

In queen conch, shell morphology is highly plastic and habitat appears to exert a strong influence on juvenile and adult morphology (references in NMFS 2007). Queen conch morphology may be quite variable among populations separated over short spatial scales (NMFS 2007, Ehrnhardt and Valle-Esquivel 2008). Differences in food availability and quality among areas may be important indirect influences on queen conch morphology and growth. Differences in shell length (Appeldoorn 1994 in NMFS 2007) as well as in lip thickness have been found among areas in the Caribbean (Stoner and Ray 1996 in NMFS 2007; Stoner et al. 2012a). Presence of predators, and abiotic factors such as depth and substrate, can also affect juvenile queen conch growth and/or morphology (NMFS 2007). Area-specific variations in growth and shell morphology, and resultant effects on maturity schedule, present problems for stock assessments because growth and maturity schedules found in any particular area may not be applicable to queen conch inhabiting other areas (NMFS 2007).

3.2.1.3. Queen Conch Sexual Maturity and Reproduction

The queen conch reaches maturity at around 3.5 - 4 years, at which time the edge of the shell lip turns outward to form the flared lip of the adult individual (Stoner et al. 2012a). After this, growth is only expressed in shell thickness (Appeldoorn 1998 in CRFM 2008; Stoner et al. 2012c). Thus, shell length is not a good descriptor of growth after the onset of first maturity (Ehrnhardt and Valle-Esquivel 2008). Sexual maturity occurs when lip thickness reaches 0.3 to 0.6 in (8 to 15 mm (0.32 – 0.59 in)) (references in Stoner et al. 2012a). A flared shell lip indicates a minimum age of 3.5 years, but there have been repeated accounts over the last two decades that a lip flare may not provide ample protection from harvest at allow individuals to reach sexual maturity (Stoner et al. 2012c). According to Stoner et al. (2012c), “some queen conch become mature with relatively thin shell lips (<7 mm (0.28 in)), while in many locations

maturity occurs at a later time." However, the report discusses that it seems likely that relatively few queen conch are reproductively mature anywhere in the greater Caribbean region in less than 1 or 2 years following formation of the shell lip flare (i.e., in their fifth or sixth year of life). The average age of maturation of queen conch off Puerto Rico is 3.2 years (about 4 years for 100 percent maturation); off St. John, USVI, it is 3 years (CFMC 2005).

Queen conch are dioecious (i.e., distinct male and female individuals) and fertilization is internal. Sex can be determined underwater by turning the shell aperture up and noting the presence of a verge (penis) when the animal emerges to right itself (Stoner et al. 2012a). In addition, when a mature queen conch is removed from the shell, sex organs can be seen and identified (Figure 3.2.1.3.1). Both males and females may copulate with multiple individuals during the spawning season. Multiple males may fertilize individual egg masses from a single female (references in NMFS 2007). Spawning occurs in aggregations (CFMC 1996a). Queen conch migrate to inshore waters to spawn during the summer months, and then return to deeper offshore waters in the winter months (references in CFMC 2005). Reproduction in queen conch is characterized by multiple spawning events over many months. Females commonly spawn 6 - 8 times per season, and produce 1 - 25 egg masses per season (CFMC 1996a in CFMC 2005). There are differences in spawning seasons at various locations throughout the species range. Peak spawning activity in the U.S. Caribbean appears to occur from May through September (references in CFMC 2005).

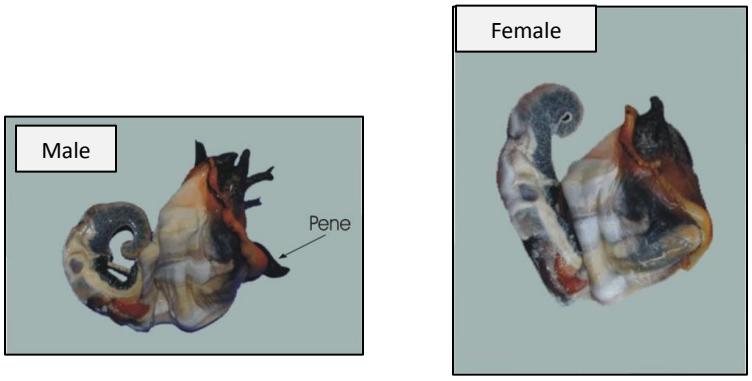


Figure 3.2.1.3.1. Queen conch out of the shell showing reproductive organs (Source: D. Aldana (undated)).

3.2.1.4. Size and Weight Relationships

The average weight of adult queen conch is highly variable. Although federal and USVI regulations require queen conch to be landed whole, there are locations where queen conch are landed after removal from the shell, therefore length/meat weight relationships become particularly important for management (NMFS 2007). Queen conch may exhibit small shells

among fully mature individuals in some places and large shelled but still immature individuals in other areas (Figure 3.2.1.4.1) (Ehrnhardt and Valle-Esquivel 2008). Several studies have pointed out that protection of queen conch is most effectively achieved with the use of a lip thickness minimum or the prohibition of juvenile harvest (no harvest of individuals without a flared lip) (CRFM 2008) because of these complex shell size-maturity relationships. Applying shell length minimums without associated lip minimums will simply select for a population dominated by small individuals, resulting in overall decreases in meat yield (CFRM 2008) and gamete production.

Figure 3.2.1.4.1. Immature (left) and mature (right) queen conch from two neighboring fishing grounds in The Bahamas. The queen conch on the left side of the figure above will yield more meat than the queen conch on the right, but it will not have an opportunity for reproduction. (Source: Ehrnhardt and Valle-Esquivel 2008).

3.2.2. Description of the Fishery

The commercial and recreational queen conch fisheries of the U.S. Caribbean are described in detail in the Queen Conch FMP (CFMC 1996), the 2005 SFA Amendment (CFMC 2005), and in Chapter 5 of the 2010 Caribbean Annual Catch Limit (ACL) Amendment (CFMC 2011a). The queen conch fishery of the USVI is discussed in detail in Chapter IV of DPNR (2005), in Kojis and Quinn (2012), and in Regulatory Amendment 1 to the Queen Conch FMP (CFMC 2010), and is incorporated herein by reference. An overview is provided below. In the discussions in this section and in following sections, "commonwealth waters" is used for waters under the jurisdiction of Puerto Rico, "territorial waters" is used for waters under the jurisdiction of the USVI, and "state waters" is used collectively for non-EEZ waters in the entire U.S. Caribbean.

The queen conch fishery in the U.S. Caribbean is mostly artisanal, and is comprised by the commercial and recreational sectors. The queen conch fishery occurs primarily in Puerto Rico commonwealth and USVI territorial waters. In St. Croix, recent landings data for the last three fishing years (20009-2012) indicate that at least 72 percent of queen conch harvested in St. Croix (territorial and EEZ) is reported to be harvested from territorial waters.

The queen conch fishery is conducted by hand harvest, either through skin diving in shallow waters or by SCUBA diving in deeper waters. It appears that shallow water queen conch resources have been depleted in many areas, and now fishermen in the U.S. Caribbean are harvesting queen conch in deeper water near the shelf edge (references in Tobias et al. 2005).

3.2.2.1 St. Croix Queen Conch Commercial Fishery

The queen conch commercial fishery of St. Croix is described in detail in Regulatory Amendment 1 to the Queen Conch FMP (CFMC 2010) and in Kojis and Quinn (2012), and is incorporated herein by reference.

The St. Croix commercial fishery is small scale and artisanal, and most fishermen also target other species, such as reef fish, pelagics, and lobster. Mean size of commercial vessels used in St. Croix is approximately 22.5 ft (6.9 m), with most being in the 16 - 25 ft (4.9 - 7.6 m) range. The average number of fishing trips per week (for all species fishing) in St. Croix is 3.4, and trip duration averages 6.5 hours (Kojis and Quinn 2012). Queen conch fishermen harvest queen conch in St. Croix territorial waters and to a lesser extent in federal waters (i.e., Lang Bank to the east of St. Croix).

The most recent census of the marine commercial fishers of the USVI (Kojis and Quinn 2012), conducted from July 2010 to March 2011, reported that 42.2 percent of 152 interviewed fishers in St. Croix fished for queen conch. An earlier census, conducted from July 2003 to June 2004,

had reported that 39 percent of the interviewed fishermen harvested queen conch in St. Croix (Kojis 2004; CFMC 2010).

Commercial USVI fishers are required to possess a license to harvest fish (including queen conch). 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). There are no federal licenses or permits issued for the commercial harvest of queen conch in the U.S. Caribbean EEZ. A person who fishes for any Council-managed species in the U.S. Caribbean EEZ must have a valid commercial fishing license issued by the governments of the USVI or Puerto Rico.

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 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.

St. Croix landings data from 2009 to 2012 indicate that an average of 40 fishermen per year harvested queen conch (territorial and federal waters combined). It is difficult to know precisely how many fishermen fished for queen conch in the EEZ, because although USVI catch report forms provide for fishermen to indicate the area where they fished, this information is not always provided. However, when this information is available it is possible to distinguish landings from territorial or EEZ waters. Section 3.2.3.1 provides information about queen conch commercial landings in the USVI. Section 3.3.1 of this document discuses data on fishing activities in territorial versus EEZ waters. Information about past and current regulations for the commercial sector can be found in Sections 1.5.1 and 1.5.2, and in Table 1.5 of this document.

3.2.2.2 St. Croix Queen Conch Recreational Fishery

Information about the recreational fishery in general in the USVI can be found in the 2010 Caribbean ACL Amendment (CFMC 2011a), Regulatory Amendment 1 to the Queen Conch FMP (CFMC 2010), and in Tobias (2005).

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). In addition, fishing permits are required to fish in some areas in the USVI territory (DPNR 2012; Section 3.4.2 of this document). In a 2005 SEAMAP-C report, Tobias (2005) discusses that there are over 2,000 registered boats in the USVI and that approximately 10 percent of the population participate in recreational fishing activities. There is no information available on the exact number of

recreational fishers or how many of them harvest queen conch in the USVI. The potential impact that this group may have on the resource is unknown (Tobias 2005). The planned implementation of a Marine Recreational Information Program will provide data on the recreational fisheries in the USVI. Recreational fishing in the EEZ requires fishermen to register in the National Angler Registry (http://www.countmyfish.noaa.gov/).

In 2010, the USVI government drafted revised regulations for the recreational sector (Tobias 2010). With respect to queen conch, several management options were proposed. These included taking no action, prohibiting the recreational harvest of queen conch, prohibiting scuba gear, requiring a fee for harvesting queen conch, requiring recreational fishers to bring queen conch to shore in shell, and reducing the bag limit to three per person and 12 per boat, consistent with federal regulations. In public hearings conducted for these draft regulations in April 2010, some participants in St. Croix supported the current territorial recreational bag limits. However, participants during the July 2010 Public Hearing supported the option that established bag limits consistent with federal waters. Fishermen recognized that queen conch is an overfished resource, and that the implementation of more restrictive regulations was justifiable because it would limit fishing pressure (Appendix II in Tobias 2010). At present, it is unknown when and which of these regulations will be chosen and implemented.

3.2.3 Status of the Queen Conch Fishery

The Queen Conch FMP is currently composed of the queen conch (*Strombus gigas*). The Council removed eight species of gastropods from the FMP in 2012 through the 2011 Caribbean ACL Amendment (CFMC 2011b). The queen conch stock of the U.S. Caribbean was reviewed in 2007 by the Southeast Data, Assessment and Review (SEDAR 14, NMFS 2007). Based on expert opinion, the review determined the queen conch stock to be overfished with overfishing continuing to occur. In 2007, the Council developed the "Queen Conch (*Strombus gigas*) Stock Assessment Manual" (Ehrhardt and Valle-Esquivel 2008) which described stock assessment models appropriate for the species, the fisheries, and the kinds of data available in the Caribbean islands and countries, including the U.S. Caribbean. In the 2010 Caribbean ACL Amendment (CFMC 2011a) management reference points based on commercial landings data, were redefined for the queen conch, among other species, including maximum sustainable yield (MSY), optimum yield (OY), and stock status determination criteria, which can be used to determine overfished and overfishing thresholds. These management reference points had been previously established in the 2005 Caribbean SFA Amendment (CFMC 2005). The 2010 Caribbean ACL Amendment also established island-specific management to enable determination of ACLs and the application of accountability measures in response to harvesting activities on a single island (Puerto Rico, St. Croix) or island group (St. Thomas/St. John) while minimizing the effects on fishing activities on the other islands or islands groups (CFMC 2011a). The 2010 Caribbean

ACL Amendment specified ACLs by island management areas for the queen conch for Puerto Rico, St. Croix, and St. Thomas/St. John.

Redefined management reference points or proxies for queen conch were based on what the Council considered the longest time series of landings data prior to the implementation of the Caribbean SFA Amendment that is considered reliable across all islands (CFMC 2011a). Average catch from commercial landings data was used as a proxy for calculating a U.S. Caribbean wide MSY for queen conch. The commercial landings data from Puerto Rico commonwealth and USVI territorial waters (state waters) and federal waters combined was derived from trip ticket reports from 1999-2005 for Puerto Rico and St. Croix, and from 2000-2005 for St. Thomas/St. John. MSY estimates do not incorporate information on recreational catches of queen conch in Puerto Rico and the USVI because this information is not collected and no alternative data are available to reliably estimate these landings. As a result, the MSY proxies specified for queen conch are expected to be underestimated to some degree, because they are solely based on commercial landings data. The U.S. Caribbean wide overfishing limit (OFL) was defined as the amount of landings corresponding to the MSY proxy. Overfishing would be determined to occur if annual commercial catches exceeded the overfishing level and scientists (in consultation with managers) attributed the overage to increased catches versus improved data collection and monitoring (Table 3.2.3.1).

The OY and ACL were set as equal values, requiring the Council to consider the socioeconomic and ecological components of OY when determining how far ACLs should be reduced below the overfishing level to account for scientific uncertainty in estimating the OFL and management uncertainty in effectively constraining harvest through time. The allowable biological catch (ABC) was set equal to the fishing level recommendation specified by the Council's Scientific and Statistical Committee (SSC) (i.e., OY=ACL=ABC). This level was estimated by the SSC to be equal to 50,000 pounds (lbs) for the island management area of St. Croix, which is the only area of the EEZ where harvest of queen conch is currently allowed (CFMC 2011a) (Table 3.2.3.1).

ACLs of zero were established for federal waters surrounding St. Thomas/St. John and Puerto Rico, as harvest has been prohibited in those federal waters since 2005 (Table 3.2.3.1). The allowable harvest of queen conch from St. Croix territorial and federal waters combined is 50,000 lbs (ACL/quota). This harvest quota does not include data on recreational landings, because these are not monitored in USVI federal or territorial waters. When total harvest reaches that level, and the USVI closes territorial waters off St. Croix to the harvest and possession of queen conch for all sectors, NMFS will concurrently close the Caribbean EEZ in the area east of 64°34' W to the harvest and possession of queen conch for all sectors. The EEZ closure for all sectors will remain in effect until the next fishing season for territorial waters opens on November 1.

Table 3.2.3.1. Management reference points and proxies for queen conch in the U.S. Caribbean federal waters established in the 2010 Caribbean ACL Amendment (CFMC 2011a). Biological management references points (MSY, OFL, OY) are based solely on commercial landings. The ACL for St. Croix is based on combined federal/territorial landings.

Reference Point	Values per EEZ island-management area				Definition
	St. Croix	St. Thomas/ St. John	Puerto Rico	U.S. Caribbean EEZ	
MSY	107,720	1,649	403,349	512,718	MSY proxy = average annual commercial landings from: 1995-2005 for Puerto Rico and St. Croix; 2000-2005 for St. Thomas/St. John
OFL	107,720	1,649	403,349	512,718	OFL =MSY proxy; overfishing occurs when annual catches exceed the OFL, and scientists (in consultation with managers) attributed the overage to increased catches versus improved data collection and monitoring.
OY, ACL	50,000	0	0	50,000	OY = ACL = ABC specified by the Council's Scientific and Statistical Committee (ABC = 50,000 lbs)

Source: CFMC (2011a)

The queen conch is currently classified as overfished in the most recent National Marine Fisheries Service's (NMFS) report to Congress on the Status of U.S. Fisheries (NMFS Status of U.S. Fisheries, 4th Quarter 2012). These reports are published on a quarterly basis by NMFS' Office of Sustainable Fisheries utilizing the most current stock assessment information. Previous reports classified the queen conch as also undergoing overfishing (NMFS, Status of U.S. Fisheries, 3th Quarter 2012). However, the most current report (4th Quarter 2012) indicated that the species is not undergoing overfishing anymore. This change in status is because queen conch reported catches have been dropping steadily over the last few years, reducing the catch below the established OFL. The queen conch is currently in the 8th year of a rebuilding plan designed to rebuild the stock by 2020.

Queen conch was listed as commercially threatened by the Convention on the International Trade in Endangered Species (CITES) in 1985 and further downgraded by CITES in 1992 to a listing in Appendix II, which requires signatory nations to manage conch stocks closely, and to monitor exports carefully to prevent extinction of the species. Many nations now have strict regulations regarding harvest of queen conch, designed to preserve their stocks (NMFS 2007). Minimum size restrictions (e.g., shell length, shell lip thickness, tissue weight, and total weight) attempt to limit the harvest of the target species to some specific portion of the population, generally the mature adults, giving all individuals in the population a chance to breed (CRFM 2008). The queen conch fishery in the U.S. Caribbean is regulated by a minimum size limit, a requirement to land queen conch with meat and shell intact, a recreational bag limit, a commercial trip limit, an annual spawning season closure, gear prohibitions (CFMC 2005), and more recently, annual catch limits for all island management areas (CFMC 2011a). Recently, both Puerto Rico and the USVI environmental resources agencies have suggested that based on their respective landings data, queen conch populations appear to be sustainable (Puerto Rico DNER Administrative Order 2013-02, February 27, 2013; Gordon 2010). However, the level of "sustainability" has not been quantitatively analyzed through the assessment process.

Queen conch stocks have been periodically surveyed around the USVI to estimate abundance, describe population trends, and monitor the effectiveness of management regulations (Gordon 2010). Most of the information on queen conch status in the USVI comes from the Southeast Area Monitoring Assessment Program in the Caribbean (SEAMAP-C) assessments (Gordon 2002, 2010; Tobias 2005) conducted by the DPNR. These surveys look at stock conditions over time around each of the islands (St. Croix, St. Thomas, and St. John) to indicate trends, but are not assessed through a peer review process.

In 2002, Gordon suggested that the St. Croix fishery had a more productive queen conch population, and that it experienced more harvest pressure and as a result, queen conch management has been more contentious in St. Croix than in St. Thomas and St. John (Gordon 2010). In addition, the lack of long time series data necessary to describe population trends and predict stock abundance and yield has been identified as an issue for monitoring queen conch populations in the USVI (Gordon 2010).

In a recent SEAMAP-C assessment, Gordon (2010) discusses that despite overfishing concerns, density estimates for St. Croix have increased in the last eight years. The author also suggests that there is an unknown but significant recreational harvest in St. Croix in addition to commercial landings. The 2010 study suggests that the queen conch population not only appears sustainable, but is increasing. The increase in abundance and predominance of juveniles and young adults around the USVI indicate that queen conch populations are capable of supporting viable queen conch fisheries under current fishing activities (Gordon 2010). However, these suggestions in SEAMAP-C report have not been assessed through a peer review process. The

study also discusses that the regulations in place for the USVI appear to be effective and a good precautionary measure, and also suggests that more information on the fishery should be obtained before considering establishing separate regulations per district. However, the author also notes that the failure of fishers to accurately and timely submit catch reports impedes the ability of DPNR's Division of Fish and Wildlife to adequately monitor queen conch harvest and the annual catch quota of 50,000 lb per district, and that enforcement of existing regulations continues to be problematic, especially on St. Croix where the majority of the harvest occurs. In addition, queen conch appear to be dense but patchily distributed, which could make queen conch vulnerable to being overfished again (Gordon 2010).

Recreational bag limit modifications proposed in this regulatory amendment, albeit mainly potentially affecting the EEZ management area of St. Croix, could also have the potential to affect the overall U.S. Caribbean OFL estimate because of the interconnectedness of the queen conch stock. As discussed earlier, the overall OFL estimate was based solely on commercial landings data of the three management areas. Concern about changing the allowed recreational bag limit has been brought up at various Council meetings in the past, given that the queen conch is classified as an overfished species and has an established rebuilding plan (NMFS Status of U.S. Fisheries 2012). Additionally, there is currently no monitoring of recreational harvest for queen conch in the USVI.

For the St. Croix management area, which is the focus of the present regulatory amendment, although only commercial harvest is monitored, the 50,000 lb ACL set for queen conch in the EEZ serves as a proxy for the harvest that is occurring in both sectors of the fishery. The established ACL is assumed to be sufficient at the moment to prevent overfishing from occurring. Therefore, increasing the total recreational bag limit, as proposed in **Alternatives 2** and **4** of Action 2, could potentially change the balance that was used to establish the ACL for the St. Croix management area. Moreover, and despite the fact that it seems more reasonable to establish compatible regulations for enforcement purposes, an increase in the recreational harvest per trip could result in the overall OFL being approached and exceeded, and therefore potentially reducing the effectiveness of the rebuilding plan for the queen conch. The current status of the queen conch may not justify an increase in harvest limits.

3.2.3.1 Queen conch commercial landings

The latest information regarding commercial landings of queen conch for the USVI and Puerto Rico, including both Puerto Rico commonwealth and USVI territorial waters and federal waters, is provided in the tables below. These landings data were obtained from trip ticket reports from both Puerto Rico and the USVI, as reported by the USVI's DPNR, and from the Puerto Rico Department of Natural and Environmental Resources (DNER). These agencies are in charge of managing the fisheries resources in their respective jurisdictions. More information regarding

commonwealth and territory fisheries management, as well as federal fisheries management, can be found in Section 3.4 of this regulatory amendment and in Chapter 5 of the 2010 Caribbean ACL Amendment (CFMC 2011a).

Tables 3.2.3.1.1 and 3.2.3.1.2 show queen conch landings per calendar year (January 1 – December 31) based on reports of fishermen for the three management areas: St. Croix, St. Thomas/St. John, and Puerto Rico, for the years 2009-2011. Landings for the three areas for calendar years 2009-2011 averaged 331,326 lbs.

Table 3.2.3.1.1. St. Croix queen conch commercial landings per calendar year (January 1 – December 31) for the years 2009, 2010, and 2011 separated in three fishing areas: USVI territorial waters (Territory), federal waters (EEZ), and trips where the fishing area was not provided (Area Not Provided). Landings are shown in pounds of queen conch meat harvested.

Year	St. Croix waters	EEZ	Area not provided	% from EEZ	% from Territory	Total Landings
2009	48,880	12,466	10,211	17	68	71,557
2010	43,520	27,322	11,075	33	53	81,917
2011	29,921	15,868	7,354	30	56	53,142

Source: SERO using USVI trip data

Based on the data shown in Table 3.2.3.1.1, commercial landings from the EEZ off St. Croix represent approximately 27 percent of the average commercial landings for 2009-2011. Total landings for 2010 and 2011 show that the 50,000 lb ACL was exceeded (ACL was not in effect in 2009). The ACL for the year 2010 was exceeded by approximately 32,000 lbs, while the ACL in 2011 was exceeded only by approximately 3,000 lbs. The USVI determined that the overage in 2010 was due to delays in reporting. Overage was less in 2011 and may reflect the improved reporting rate. During the December 2012 Council meeting, it was suggested that management measures appeared to be keeping landings close to ACL (144th CFMC Meeting Transcript, December 2012).

Table 3.2.3.1.2. Queen conch commercial landings per calendar year (January 1 – December 31) for the years 2009, 2010, and 2011 for St. Croix, St. Thomas/St. John, and Puerto Rico. Landings are reported in pounds of queen conch meat harvested.

Year	St. Croix	St. Thomas/St. John	Puerto Rico	Total
2009	71,557	1,329	273,309	346,195
2010	81,917	1,577	273,459	356,953
2011	53,142	1,930	235,759	290,831
Total Landings 2009-2011	**206,616**	**4,836**	**782,527**	**993,979**

Source: SERO using USVI trip data

3.2.4 Protected Species

There are 32 different species of marine mammals that may occur in the Caribbean (UNEP 2008). All 32 species are protected under the Marine Mammal Protection Act and five (sperm, sei, fin, blue, and humpback whales) are also listed as endangered under the Endangered Species Act (ESA). The U.S. Caribbean provides nesting, foraging, and developmental habitat for three sea turtle species listed as threatened or endangered under the ESA: the leatherback, hawksbill, and green. Loggerhead sea turtles are only occasionally seen, but are transitory (Hillis-Star et al., 1998). In addition, there are two listed *Acropora* coral species (elkhorn (*Acropora palmata*) and staghorn (*A. cervicornis*). Critical habitat has been designated for green, hawksbill, and leatherback sea turtles, and for *Acropora*, in the Caribbean region.

There is little potential for direct effects on listed species. Queen conch harvest is only conducted by hand, which makes it easy for divers harvesting conch to avoid interacting with listed species if they are encountered. Green, hawksbill, and leatherback sea turtle critical habitat is not anticipated to be affected by the harvest of queen conch (NMFS 2005).

Indirect effects from the queen conch fishery are limited to potential effects to *Acropora* critical habitat. By harvesting herbivore species, such as queen conch, their ability to maintain robust populations and to graze on algae may be reduced, potentially affecting *Acropora* critical habitat features. While algae, including crustose coralline algae and fleshy macroalgae, are natural components of healthy reef ecosystems, increases in the dominance of algae since the 1980s impede coral recruitment. Fleshy macroalgae are able to colonize dead coral skeleton and other hard substrate and some are able to overgrow living corals and crustose coralline algae. Because crustose coralline algae is thought to provide chemical cues to coral larvae indicating an area is appropriate for settlement, overgrowth by macroalgae may affect coral recruitment (Steneck 1986). Several studies show that coral recruitment tends to be greater when algal biomass is low

(Rogers et al. 1984, Hughes and Jackson 1985, Connell et al. 1997, Edmunds et al. 2004, Birrell et al. 2005, Vermeij 2006).

3.3 Economic and Social Environment

3.3.1 Economic Description of the Fishery

Economic descriptions of the queen conch fishery of the U.S. Caribbean are contained in Cimo et al. (2012), DPNR (2005), Gordon (2010), Grace-Mccasky (2012), Kojis and Quinn (2011), and Liese and Stoffle (2012) and are incorporated herein by reference. Information on effort, total harvest, and the economics of the recreational harvest of queen conch in the U.S. Caribbean is unknown. As a result, the following description is limited to a discussion of the commercial fishery.

As discussed in Chapter 1, harvest of queen conch in the EEZ in the U.S. Caribbean is limited to the Lang Bank area off St. Croix. As a result, the following discussion is limited to a description of the commercial queen conch fishery in St. Croix. Tables 3.3.1.1 through 3.3.1.5 contain estimates of the number of fishermen and ex-vessel revenue (nominal or uninflated dollars) from queen conch and all other species harvested by queen conch fishermen in St. Croix by fishing year for the 2009/2010 through 2011/2012 fishing years. Across the three fishing years, an average of 40 fishermen per year harvested queen conch, but the number of fishermen has declined in each of the past three fishing years (Table 3.3.1.1). The average ex-vessel revenue per season was approximately $405,000, or approximately 15.6 percent of all revenue from all species harvested by queen conch fishermen (approximately $2.58 million). The average revenue per fisherman over this period was approximately $64,000. However, the average revenue was highest over this three-year period in the 2010/2011 fishing year, approximately $80,000 per fishermen, and was approximately 38 percent lower, approximately $49,000, in the 2011/2012 fishing year. The average price per pound of queen conch was variable over these three fishing years and averaged $6.86 per pound.

Table 3.3.1.1. Number of fishermen and ex-vessel revenue (nominal* dollars), St. Croix, 2009/2010-2011/2012 fishing years.

	Fishing Year			
	2009/2010	**2010/2011**	**2011/2012**	**Average**
Number of Fishermen	48	41	30	40
Revenue from Queen Conch	$489,971	$498,665	$226,130	$404,922
Revenue from Other Species	$2,513,475	$2,773,616	$1,250,483	$2,179,191
Total Revenue	$3,003,446	$3,272,281	$1,476,613	$2,584,113
Average Total Revenue per Fisherman	$62,572	$79,812	$49,220	$63,868
Percent Queen Conch	16.31%	15.24%	15.31%	15.62%
Average Price per Pound of Queen Conch	$6.71	$6.99	$6.87	$6.86

*not inflated to a common year. Source: SERO using USVI trip data.

Tables 3.3.1.2 through 3.3.1.5 disaggregate this information by area fished (territorial waters, EEZ, or "not reported") by fishing year. Because of the high number of reports that did not report area fished, it is difficult to draw conclusions based on the summary information contained in these tables. The number of fishermen by area fished are not additive in each table because these totals only reflect the number of unique fishermen who recorded harvests from the appropriate waters. For example, during the 2009/2010 fishing year, 48 fishermen recorded queen conch harvests in St. Croix (Table 3.3.1.1). Among the 48 fishermen, 37 recorded harvests from territorial waters, 23 from the EEZ, and 10 reported trips on which the area fished was not recorded (Table 3.3.1.2).

Table 3.3.1.2. Number of fishermen and ex-vessel revenue (nominal* dollars), St. Croix, by area fished, 2009/2010 fishing year.

	2009/2010		
	STX Territory	**EEZ**	**Not Reported**
Number of Fishermen	37	23	10
Revenue from Queen Conch	$282,110	$147,954	$59,907
Revenue from Other Species	$1,177,424	$1,169,924	$166,127
Total Revenue	$1,459,534	$1,317,878	$226,034
Average Total Revenue per Fisherman	$39,447	$57,299	$22,603
Percent Queen Conch	19.33%	11.23%	26.50%

*not inflated to a common year. Source: SERO using USVI trip data

It is unknown how many of fishermen who harvested queen conch in the 2009/2010 fishing year fished only in territorial waters or EEZ waters, or in both. However, at least one fisherman fished only in the EEZ. This result is derived by assuming the 10 fishermen who did not record the area fished actually fished in territorial waters, increasing the number of fishermen who fished in territorial waters to a maximum of 47 (Table 3.3.1.2), or one less than the total number of fishermen who reported queen conch harvests (48; Table 3.3.1.1). This "one less" fisherman, therefore, must have only fished in the EEZ. Conversely, if all 10 fishermen who did not report the area fished actually fished in the EEZ, then the number of fishermen who only fished in the EEZ would increase to 11 (48 total – 37 territorial = 11). Thus, the estimated range of the number of fishermen who only harvested queen conch in the EEZ during the 2009/2010 fishing year is 1-11. Applying similar logic to the 2010/2011 fishing year, the estimated range of the number of fishermen who only harvested queen conch in the EEZ is 0-9 (Tables 3.3.1.1 and 3.3.1.3; 41 total – 32 territorial = 9; unlike the situation for the 2009/2010 fishing year, examination of the participant counts in total and by area does not support determination of a higher lower bound than 0), while no fishermen only harvested queen conch in the EEZ in the 2011/2012 fishing year (Tables 3.3.1.1 and 3.3.1.4; 30 total – 30 territorial = 0).

Table 3.3.1.3. Number of fishermen and ex-vessel revenue (nominal* dollars), St. Croix, by area fished, 2010/2011 fishing year.

	2010/2011		
	STX Territory	**EEZ**	**Not Reported**
Number of Fishermen	32	19	15
Revenue from Queen Conch	$258,596	$163,821	$76,248
Revenue from Other Species	$1,244,785	$1,257,405	$271,426
Total Revenue	$1,503,381	$1,421,226	$347,674
Average Total Revenue per Fisherman	$46,981	$74,801	$23,178
Percent Queen Conch	17.20%	11.53%	21.93%

*not inflated to a common year. Source: SERO using USVI trip data

Queen conch accounted for a higher proportion of the total average fishing-year revenue over the period examined on trips taken in territorial waters, approximately 18 percent, than on trips taken in the EEZ, approximately 11 percent of total revenue (Table 3.3.1.5). The results of this comparison could change, however, if the trips on which the area fished was not reported primarily occurred in one area or the other. If all harvest from the trips on which the area fished was not reported occurred exclusively in, alternatively, territorial waters or the EEZ, queen conch would have accounted for approximately 19 percent of the total revenue on trips in

territorial waters (all "area unreported" harvests attributed to territorial waters) and approximately 13 percent of the total revenue on trips in the EEZ (all "area unreported" harvests attributed to the EEZ). Overall, fishermen who harvested queen conch received more than 80 percent of their total average fishing-year revenue from species, primarily parrotfish and spiny lobster, other than queen conch.

Table 3.3.1.4. Number of fishermen and ex-vessel revenue (nominal* dollars), St. Croix, by area fished, 2011/2012 fishing year.

	2011/2012		
	STX Territory	**EEZ**	**Not Reported**
Number of Fishermen	30	9	0
Revenue from Queen Conch	$197,464	$28,666	$0
Revenue from Other Species	$964,360	$286,123	$0
Total Revenue	$1,161,824	$314,789	$0
Average Total Revenue per Fisherman	$38,727	$34,977	
Percent Queen Conch	17.00%	9.11%	

*not inflated to a common year. Source: SERO using USVI trip data

Table 3.3.1.5. Average number of fishermen and ex-vessel revenue (nominal* dollars), St. Croix, by area fished, 2009/2010-2011/2012 fishing years.

	Average 2009/2010 - 2011/2012		
	St. Croix Territory	**EEZ**	**Not Reported**
Number of Fishermen	33	17	8
Revenue from Queen Conch	$246,057	$113,480	$45,385
Revenue from Other Species	$1,128,856	$904,484	$145,851
Total Revenue	$1,374,913	$1,017,964	$191,236
Average Total Revenue per Fisherman	$41,664	$59,880	$22,948
Percent Queen Conch	17.90%	11.15%	23.73%

*not inflated to a common year. Source: SERO using USVI trip data

3.3.2 Social and Cultural Environment

Detailed descriptions of the social environment of the queen conch fishery are included in Regulatory Amendment 1 to the Queen Conch FMP (CFMC 2010), 2010 Caribbean ACL Amendment (CFMC 2011a), 2011 Caribbean ACL Amendment (CFMC 2011b), Valdés-Pizzini et al. (2010), Grace-Mccaskey (2012), and Stoffle et al. (2009) and are incorporated herein by reference. St. Croix licensed fishermen are described in detail in the recent census of commercial fishermen (Kojis and Quinn 2012) which is incorporated by reference; however, some elements of the study are summarized below.

This section includes a description of the queen conch fishery in St. Croix. Queen conch is harvested in the territorial and federal waters of St. Croix; however, this amendment only proposes changes to the regulations for queen conch in federal waters (in order to establish federal regulations that are compatible with USVI and Puerto Rico regulations) and therefore the following analysis focuses primarily on harvests which occur in the EEZ and harvesters that fish for queen conch in the EEZ. Some territorial harvest information is provided for context when appropriate. The larger fishing community of St. Croix is also summarized in order to provide context on the dependence of queen conch fishing by community members.

Data are presented at the community level, when possible, in order to meet the requirements of National Standard 8 of the Magnuson-Stevens Act). National Standard 8 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 is presented at the island of St. Croix level because data is not available at a lower level of analysis (not available at the place-based community level of analysis).

St. Croix Fishing Community

Commercial Fishers

The island of St. Croix encompasses 84 square miles. The population of St. Croix includes 106,405 people (U.S. Census 2010). Fishers make up about 0.28 percent of the population (Kojis and Quinn 2012). There are 218 licensed commercial fishermen in St. Croix (number includes those listed in the 2010-2011 DPNR Division of Fish and Wildlife commercial fisher registration list, Kojis and Quinn 2012). There has been a decline of 46 fishermen in the total number of registered fishermen in St. Croix and in the percentage of registered fishermen in the population (decline of 0.28 percent) from 2000 to 2010; however during the same time period the total population of St. Croix also declined (Kojis and Quinn 2012).

As explained in Section 1.6, St. Croix licensed commercial fishermen commonly fish with helpers or other fishermen. For each licensed fisherman there are on average 0.9 helpers per

fisher (the range included zero to four helpers reported by interviewed fishermen) and an additional 0.4 of a licensed commercial fisher fishing with each licensed fishermen (the range included zero to three commercial fishers fishing alongside a licensed fisherman as reported by interviewed fishermen (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 3.3.2.1). Queen conch was the fourth most commonly targeted category with 42.2 percent of interviewed fishermen (65 fishermen) targeting queen conch (Table 3.3.2.1).

Table 3.3.2.1. Relative importance of categories of fish, mollusks, and crustaceans to interviewed licensed commercial fishers. Frequency includes the number of fishermen who answered that they harvest a particular category. Percentages can equal more than 100 percent because fishermen harvested more than one category.

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%

Source: 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).

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).

Most fishermen in St. Croix house their fishing boats at home, transport them by trailer, and launch their vessels from sites around the island. 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).
It is difficult for fishermen to find other employment (58.2 percent of fishermen interviewed indicated it was very hard or hard to find other employment, (Kojis and Quinn 2012)). However, 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 ethnic composition of St. Croix fishermen has also changed over time with no Hispanic fishermen reported in St. Croix in 1930; however, in 2010, Hispanic fishermen comprised 53 percent of fishermen. Other top ethnic backgrounds identified by licensed commercial fishermen include West Indian (20.3%), Crucian (14.2%) and those of British descent (6.1%, (Kojis and Quinn 2012)). The age average age of St. Croix licensed fishermen is 54 years old (Kojis and Quinn 2012).

Recreational Fishers

Inshore recreational fishers are likely the hardest recreational group to account for; however it is estimated that there are thousands of USVI residents who fish recreationally on an annual basis in the inshore environment (Valdés-Pizzini et al. 2010). In St. Croix, there were about 566 registered recreational boats in 2002 (of which about 55.2 percent fish inshore and 44.8 percent fish offshore) and about 720 fishers on recreational boats (Eastern Caribbean Center 2002). The offshore fleet in St. Croix includes about 30 fishing boats on the north and east coasts of the island (Mateo 2000).

St. Croix Queen Conch Fishing

Queen conch is caught primarily through free diving or SCUBA diving. In the Caribbean EEZ, fishing for queen conch is only allowed in the EEZ subzone of St. Croix which contains the Lang Bank area (as discussed in Section 1.3). As described in Section 3.2.3, the combined commercial harvest from territorial and federal waters has ranged from a high of 81,917 lbs to a low of 53,142 lbs for St. Croix queen conch over the last several years (2009 - 2011, Table 3.2.3.1.1). Queen conch is caught primarily in territorial waters. Commercial landings of queen conch from

federal waters have comprised about 17 percent (low of 12,466 lbs in 2009) to 33 percent (high of 27,322 lbs in 2010) of total St. Croix commercial landings of queen conch over the last several years (2009 - 2011, Table 3.2.3.1.1). Commercial landings for the time period include a summed total of 55,656 lbs of queen conch caught in the EEZ (Table 3.2.3.2.1, this summed total can be used to compare against the landings totals for other species caught by queen conch fishermen as reported below in Figure 3.3.2.1). Recreational landings of queen conch are not reported and total catch for the recreational sector is not known. However, if the ACL/quota of 50,000 lb harvested queen conch is met by the commercial sector, then fishing for both commercial and recreational queen conch is closed in both territorial and federal waters. In addition to commercial and recreational uses, queen conch is also utilized by fishermen for subsistence. In a recent census of licensed commercial fishermen in St. Croix, 14.4 percent of all interviewed fishermen (including those fishermen who do not harvest queen conch) reported that they primarily consumed conch or gave away conch to their friends to consume (Kojis and Quinn 2012).

For the last several years, there have been 30 to 37 fishermen who fish for queen conch in the territorial waters of St. Croix (Table 3.3.2.2). Whereas, there has been a range of nine to 23 fishermen who fish for queen conch in federal waters (Table 3.3.2.2). It is not known how many of these fishermen fish in both territorial and federal waters. These totals are based off of the catch area reported by fishermen for the fishing years 2009/2010 through 2011/2012. For the fishing years of 2009/2010 and 2010/2011, there were 10 and 15 fishermen respectively, who did not report their queen conch fishing area (Table 3.3.1.2 and Table 3.3.1.3). As mentioned above, in the recent census of licensed commercial fishermen, 65 fishermen in St. Croix reported that they targeted queen conch (Kojis and Quinn 2012).

Table 3.3.2.2. Number of St. Croix queen conch fishermen by area fished (Territory or EEZ) for the fishing years of 2009/2010, 2010/2011, and 2011/2012.

	2009/2010		**2010/2011**		**2011/2012**	
Area Fished	St. Croix Territory	EEZ	St. Croix Territory	EEZ	St. Croix Territory	EEZ
# of Fishers	37	23	32	19	30	9

Source: SERO using USVI trip data

The majority of fishermen in St. Croix fish with helpers or fish with other commercial fishermen; however, this is not specific to queen conch fishermen (Kojis and Quinn 2012). On average,

queen conch fishers make 3.2 trips per week and have two fishers (e.g., helpers (unlicensed) and/or another licensed fisherman) on board (Valle-Esquivel 2003).

Commercial queen conch fishermen in the EEZ also fish for a variety of other species. The two top categories of other species caught by queen conch fishermen include parrotfish (species of parrotfish specified by fishermen in catch records include princess, queen, redband, redfin, and stoplight) and spiny lobster (Figure 3.3.2.1). A large amount of snappers (species of snappers specified by fishermen in catch records include blackfin, gray, mahogany, mutton, and yellowtail) are also caught by queen conch EEZ fishermen (approximately 42,103 lbs of snappers were landed for the last three fishing years, Figure 3.3.2.1). In addition, a sizable amount of dolphinfish, triggerfishes, grunts, surgeonfishes, and groupers are also caught by commercial queen conch EEZ fishermen (Figure 3.3.2.1). Many additional species are also harvested by these fishermen; however these species are landed in smaller quantities.

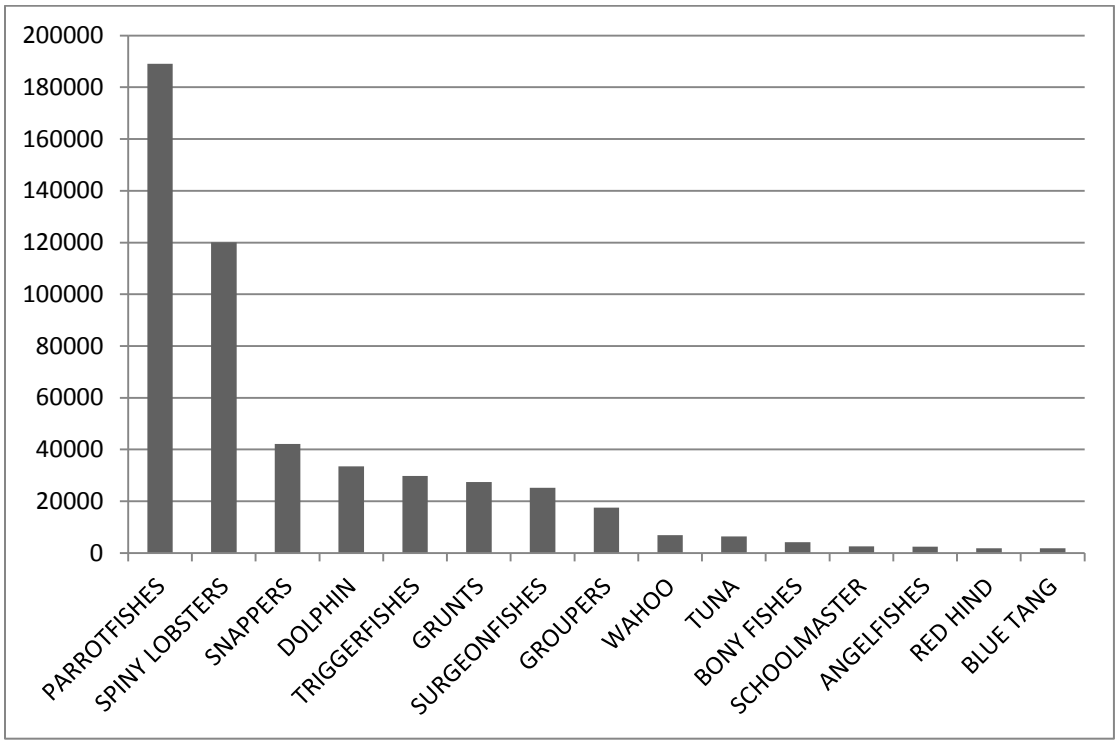


Figure 3.3.2.1. Top 15 other species categories landed by St. Croix queen conch fishermen fishing inside the EEZ, by pounds landed. Total by species category have been summed for fishing years 2009/2010, 2010/2011, and 2011/2012. (Source: SERO using USVI trip data).

3.3.3 Environmental Justice Considerations

Executive Order 12898 requires federal agencies to consider "the 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 (U.S.) and its territories…". In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. This executive order is generally referred to as environmental justice (EJ).

Minority populations: In the USVI, the majority of the population is Black or African American (77.5 percent including those of two or more races) according to the year 2010 Census, whereas the percentage of the population comprised of Black or African American residents of the continental U.S. was 13.6 percent for the same year. The rate of Hispanic or Latino residents is also higher in the USVI (17.4%) than in the continental U.S. (16.3%, U.S. Census 2010). The minority rate for the USVI is substantially higher (86.5%) than that of the continental U.S. (36.3%, U.S. Census 2010).

Low-income populations: Low-income populations in the USVI make up a much greater percentage of the general population than in the continental U.S. For the year 2010, the poverty rate for the USVI was 22.2 percent, higher than the rate for the continental U.S., which was 15.1 percent for the same year (U.S. Census 2010). This higher poverty rate indicates that in the USVI, more individuals 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 queen conch fishermen in St. Croix and information is not available in most cases to link these fishermen to the place-based communities in which they reside, all communities (when data was available) in St. Croix 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 and of the island St. Croix 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.

As mentioned above, the poverty rate for the USVI in 2010 was 22.2 percent. This value translates into an EJ poverty threshold of approximately 26.6 percent. When threshold for the USVI Territory is examined, the communities below exceed these poverty thresholds and are likely the most vulnerable to EJ concerns (Table 3.3.3.1).

Table 3.3.3.1. St. Croix communities that exceeded the poverty threshold for the year 2010.

Community	Poverty Rate
Christiansted	41.1
Frederiksted	45.9
Frederiksted Southeast	38.9

Source: U.S. Census Bureau 2010

The greater territory of the USVI and the majority of the communities expected to be affected by this proposed regulatory amendment have minority or economic profiles that include higher rates than that of the continental U.S. EJ issues could arise as a result of this proposed amendment concerning 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 fishing and consuming these fish to supplement their income. If their ability to retain queen conch is decreased (as is possible in the commercial trip limit action for licensed fishers who fish with other licensed fishermen because the maximum trip limit per vessel would be reduced to 200 queen conch), it is possible that their ability to feed themselves and their families could be impacted. However, because very few fishers who fish with other licensed fishermen reported that they caught more than 200 queen conch per trip, it is unlikely that this action would have a significant impact on low-income populations. In addition, these fishermen are likely engaged in other fisheries and also utilize those fisheries for subsistence and therefore should not be severely impacted by a reduction in the amount of queen conch per trip. Low-income recreational fishermen should not be impacted (positively or negatively) because the status quo alternative has been selected as preferred for the recreational bag limit action.

3.4 Administrative Environment

3.4.1 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 percent 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 fishery management plans (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. 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/).

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/.

3.4.2 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., ceti) 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. As discussed in Section 3.2.2.2, the USVI government is currently developing recreational fishing regulations for the Territory.

Additional information regarding fishery management in state or federal waters can be found in Section 2.1 of the Comprehensive 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 3.2.2.

Chapter 4. Environmental Effects

Chapter 4 describes the effects to the physical, biological, economic, social, and administrative environment from the alternatives in Action 1.

4.1. Action 1: Modify the trip limit for the commercial harvest of queen conch in the U.S. Caribbean exclusive economic zone (EEZ).

The EEZ management subzone of St. Croix is the only area in federal waters where fishing for queen conch is currently allowed.

Alternatives

Alternative 1: No Action

Preferred Alternative 2: 200 queen conch per vessel/day

Alternative 3: 150 queen conch per vessel/day if one fisher; 200 queen conch per vessel /day if > 1 fisher

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. Action 1 proposes to modify the commercial trip limit for the harvest of queen conch in the U.S. Caribbean EEZ. In the EEZ, this harvest is limited to the area to the east of St. Croix, U.S. Virgin Islands (USVI), specifically in the area of Lang Bank, from November 1 through May 31, each year. The queen conch fishery in the U.S. Caribbean is conducted through hand harvest while free diving or SCUBA diving by a relatively small number of fishermen. Hand harvesting methods are expected to have little to no adverse effects on the physical environment. Therefore, because none of the alternatives proposed for this action would change the primary gear or how it is used in this fishery, no direct effects on the physical environment would be expected over the short or long term from any of the alternatives proposed (**Alternative 1**, **Preferred Alternative 2**, and **Alternative 3)**. Moreover, this action is not expected to have adverse direct impacts on essential fish habitat (EFH) identified for the queen conch. Indirect effects vary depending on the alternative proposed and are discussed below.

Alternative 1 is the no action alternative, and would not change current commercial trip limit in the EEZ established by the Queen Conch Fishery Management Plan (FMP) in 1996. As discussed in Section 2.2 of this document, continued fishing in the EEZ at the present level of effort could potentially cause the annual queen conch quota to be reached faster, resulting in a shortened fishing season. Shortening the fishing season could have indirect effects on the overall physical environment because of the expected reduction in the amount of queen conch fishing

vessels in the area during the time that the season was shortened. Fewer vessels results in fewer interactions between habitat and fishing gear (i.e., anchors).

Both **Alternative 2** and **Alternative 3** would modify the commercial limit for the harvest of queen conch in the EEZ to be compatible (**Alternative 2)** or partially compatible **(Alternative 3)** with USVI commercial limits. **Alternative 2** has the potential of increasing the rate of harvest, and thus potentially shortening the fishing season, when there is only one fisherman fishing on a trip, because the individual harvest would be increased by 50 additional queen conch to achieve the new trip limit. In case there is more than one fisherman on board, the rate of harvest would be decreased because fishermen can only fish up to 200 queen conch per vessel per day, potentially prolonging the fishing season. **Alternative 3** would maintain the rate of harvest if there is one fisher onboard but would decrease the rate of harvest if multiple fishers are present, therefore potentially prolonging the fishing season. However, as discussed in Section 2.2, although modifying the trip limit at the various levels proposed by these alternatives may affect the rate at which the annual catch limit (ACL) quota is reached, both **Alternative 2** and **3** are expected to have very little impact on the rate of approach to the 50,000 lb queen conch landings quota in St. Croix because the change in harvest patterns will be small as shown in Table 2.2.1. Based on this discussion, the potential of shortening the fishing season by any of these alternatives is minimal. Therefore, because each of these alternatives would be expected to have a very small effect on the length of the fishing season, no indirect effects to the physical environment in the form of changed habitat/gear interactions, would be expected.

4.1.2. Direct and Indirect Effects on the Biological/Ecological Environment

Alternative 1 is the no action alternative and would not change the current commercial trip limit in the EEZ established by the Queen Conch FMP in 1996. The current commercial trip limit allows a person with a valid commercial fishing license to harvest up to 150 queen conch per day. This trip limit is not compatible with the USVI daily limit of 200 queen conch per vessel. The current harvest allowance in federal waters also has the potential to allow for a more rapid rate of harvest because it does not put a cap on the number of queen conch that could be fished if more than one licensed person is on board, and as discussed above for the physical effects, continuing fishing in the EEZ at the present level of effort could potentially result in a shortened fishing season. **Alternative 1** offers no additional protection to queen conch beyond current regulations, and is not expected to provide any direct biological benefits to queen conch because it would maintain the status quo rate at which the ACL is reached but would not have any overall effect on the total amount of harvest that is currently allowed in the EEZ. As discussed earlier, the ACL for queen conch from St. Croix territorial and federal waters combined is 50,000 lbs. When total harvest reaches that level and the USVI closes territorial waters off St. Croix to the

harvest and possession of queen conch, the National Marine Fisheries Service (NMFS) will concurrently close the St. Croix EEZ to the harvest and possession of queen conch. **Alternative 1** would not address potential enforcement issues and thus would not provide any indirect biological and/or ecological benefits that may derive from better enforcement of regulations intended to protect the queen conch resource.

Preferred Alternative 2 proposes to change the current EEZ commercial trip limit to be compatible with the USVI territorial limit. This would change the current daily limit of 150 queen conch per licensed fishermen to a daily limit of 200 queen conch per vessel. Similar to **Alternative 1**, **Preferred Alternative 2** is not expected to provide any direct biological benefits to queen conch because, as discussed above and in Section 2.2.1, modifying the current trip limit would not have any overall effect on the total amount of harvest that is currently allowed in St. Croix territorial and EEZ waters but may affect the rate at which the ACL/quota is achieved. Even if under **Preferred Alternative 2** a licensed fisherman fishing alone increases his harvest by 50 additional queen conch to reach the new vessel/trip limit (which would most likely contribute to shorten the fishing season), analyses of landings data from the most recent three fishing years (2009/2010, 2010/2011, and 2011/2012) suggest that the rate of approach to the 50,000 lb quota in St. Croix would only increase by less than 1 percent if queen conch is reported as landed uncleaned or by 1.5 percent if reported as landed cleaned (Table 2.2.1). In fact, the majority of the queen conch trips in the EEZ for the most recent three fishing years, did not harvest or exceed the new proposed daily limit of 200 queen conch per vessel (Table 1.6.3). Overall, the new trip limit proposed by **Preferred Alternative 2**, is predicted to result in very little impact on the rate of approach to the 50,000 lb queen conch landings quota in St. Croix. This is because landings in the EEZ in recent years represent only 28 percent of the overall St. Croix landings and only eight percent (if reported as uncleaned meat) or 20 percent (if reported as cleaned meat) of those EEZ trips reported landing between 150 and 200 queen conch. Thus, direct biological effects from **Preferred Alternative 2** would be expected to be minimal because this alternative would result in very little change to the harvest rates or even harvest patterns of queen conch landings in St. Croix. Establishing a compatible trip limit as proposed by **Preferred Alternative 2** may indirectly provide the biological and ecological environments with an increase in protection because it would allow for efficiency in enforcement.

Alternative 3 would modify the current trip limit for the commercial harvest of queen conch in the EEZ to allow for no more than 150 queen conch per vessel per day if there is one licensed commercial fisherman on board, or no more than 200 queen conch per vessel per day if there is more than one commercial fisherman on board. This alternative would be partially compatible with the USVI as it sets the maximum daily harvest at 200 queen conch per boat, but will also address the allowed harvest if there is only one licensed fisher on board. This alternative differs from **Preferred Alternative 2** in that it sets the trip limit at 150 queen conch if there is only one licensed fisher on a trip. This alternative is not expected to provide any direct long-term

biological benefits to queen conch because, similar to **Preferred Alternative 2**, it would only potentially affect the rate at which the ACL quota is reached, with the rate affected very minimally, and not the total amount of queen conch allowed to be harvested in the EEZ (i.e., would not directly reduce fishing mortality because the fishery closes when the ACL is reached). However, **Alternative 3** does not address potential issues that enforcement may encounter when only one licensed person is on board, and this would not contribute to efficiency in enforcement and would not provide any indirect biological and/or ecological benefits that may derive from better protection of the queen conch resource in the EEZ.

Management actions that affect the role of the species within its habitat have the potential of affecting the biological and ecological environment. The effect of Action 1 on the biological and ecological environment, which includes the EFH for other managed species, for example, would depend on how much the queen conch biomass in the area would be affected by the harvest allowances proposed in the different alternatives. For example if we were to analyze the effect of the alternatives on the EFH for other species (e.g., fish, invertebrates) **Alternative 1** is the "status quo," thus the effect would remain the same as present. **Preferred Alternative 2** would be expected to decrease the effect on EFH if there is only one fisher, because the daily quota would increase by 50 queen conch. This is because we assume that increasing the daily queen conch harvest limit for the commercial sector would hasten the reaching of the ACL quota, which would reduce the length of the fishing season. However, because this alternative is expected to minimally affect the rate of harvest to reach the ACL quota, any effect on the biological/ecological environment, which includes the EFH, is also expected to be minimal. Because we do not know from which specific type of benthic habitat in Lang Bank the queen conch is being removed, a specific quantification of the effect on EFH cannot be determined. As discussed in Section 3.1.3.1 of this document, at least in the Lang Bank area Marine Protected Area (area surveyed), consolidated habitat accounts for 72 percent of the benthic habitat, unconsolidated habitat accounts for 27 percent, and submerged aquatic vegetation accounts for one percent. We assume the effect on EFH is distributed proportional to its area (see Table 3.1.3.1.1. and Figure 3.1.3.1.3). As discussed in Section 3.1.3.2, removing the queen conch shell affects the available shell habitat (EFH) used by other invertebrates and fish in their juvenile and adult stages as refuge or place for attachment. However, as explained above, this effect is expected to be minimal due to a marginal change in the rate of harvest and no change at all in the total harvest.

Protected species and/or critical habitat for these species could be affected by fishery actions that increase interactions between fishing gear and the species, increase bycatch, and/or that increase, reduce, or redistribute fishing effort to areas where protected species and/or critical habitat occurs. There is little potential for direct biological effects on listed species. Queen conch harvest is only conducted by hand, which makes it easy for divers harvesting queen conch to avoid interacting with listed species if they are encountered. Critical habitat for the green,

hawksbill, and leatherback sea turtles is not anticipated to be affected by the harvest of queen conch. As discussed in Section 3.2.4 , indirect effects from the queen conch fishery are limited to potential effects to *Acropora* critical habitat. The direct removal of herbivore species such as the queen conch, may affect grazing activities that keep the macroalgae at an optimum level. An overgrowth of macroalgae may affect coral recruitment. A more rapid rate of harvest, as would occur in **Preferred Alternative 2** if there was only one fisher harvesting queen conch in a vessel, or in **Alternative 1** with multiple fishers on a vessel, would likely decrease the time a queen conch could spend grazing in potential *Acropora* critical habitat. The opposite would occur in **Alternative 3**. However, because none of the alternatives in this action would have any overall effect on the total amount of queen conch harvest that is currently allowed in the EEZ, there will be no indirect biological/ecological effects on *Acropora* critical habitat that are different than those currently occurring in the fishery.

In summary, none of the alternatives proposed would directly benefit or harm the biological and ecological environment, or indirectly affect protected species, because they would just minimally affect the rate at which the established ACL quota is achieved and have no effect on the overall harvest allowance in the EEZ/Territory. The ACL quota was established to prevent overfishing of the queen conch resource and rebuild the stock. However, indirect benefits to the biological and ecological environment may be obtained by compatible regulations in **Preferred Alternative 2** due to an increase in protection accorded to the queen conch, resulting in more efficient and effective enforcement of harvest regulations. Enforcement could be facilitated by having consistent regulations, which allows for straightforward application of the law, and removes confusion as an excuse for non-compliance. Some increased enforcement efficiency may be gained under **Alternative 3** but to a lesser degree because this alternative is only partially compatible with USVI territorial regulations.

4.1.3. Direct and Indirect Effects on the Economic Environment

In the following discussion, while an attempt is made to capture all expected direct and indirect effects, no attempt is made to label individual effects as either direct or indirect effects. The determination of whether an effect is direct or indirect can often be a subjective conclusion and the significance of the effect to the recipient of the effect would not be expected to matter whether the effect results directly or indirectly from the proposed action. Further, making such determinations, i.e., whether a particular potential effect is a direct or indirect effect, is beyond the scope of this analysis. Nevertheless, as a general guide for the reader, the prime example of a direct effect would be a change in queen conch harvest and revenue (and associated profit) as a result of changing the amount of queen conch that can be harvested. Most, but not necessarily all, other effects could be argued to precipitate from this effect, thus becoming indirect effects, and examples would include market effects (change in market supply and quota closure), change

in fishing pressure for alternative species, and improved management and possibly resource health as a result of a reduction of regulatory inconsistency between EEZ and territorial regulations.

Commercial and recreational fishermen, and associated businesses and communities, receive economic benefits from the harvest of queen conch. These economic benefits take the form of revenue and profits to fishermen, consumer surplus to recreational fishermen, revenue and profits to businesses that support both commercial and recreational harvest, and economic stability to communities where these activities occur and services are provided. These benefits can be of short- or long-term duration depending on the health of the resource and the manner in which the resource is managed. Short-term trade-offs of benefits occurs when harvests are reduced in the short-term to allow stock growth and potentially larger, more sustainable harvests in the future. Benefits may also be foregone if regulations overly restrict harvest beyond the needs of the resource and environment. The optimal management plan considers the needs of the resource (and environment) in tandem with harvest demand and attempts to implement the suite of management measures that will produce a healthy and sustainable resource while producing optimum yield. Determining the optimum yield incorporates consideration of the potential biological, economic, and social benefits that can be derived from the resource. When determining the optimum yield, and identifying appropriate management, harvest from all harvest sectors and areas of harvest, including harvest from both EEZ and state waters, must be factored into the management decision.

As described in Section 1.5, the current queen conch harvest regulations in the U.S. Caribbean are not uniform across all sectors or areas of harvest. As previously discussed, management measures should be consistent with the biological needs of the resources while achieving optimum yield as determined by environmental, economic, and social considerations. Insufficiently restrictive management measures that do not satisfy the biological needs of the resource (or the needs of the overall biological environment) also trade long-term economic (and social) benefits for higher short-term economic benefits. Regulations that satisfy the biological and environment needs but overly restrict harvest result in foregone economic benefits. The management goal is to allow harvest sufficient to satisfy the resource and environmental needs and ensure that both short and long-term economic (and social) benefits are not foregone.

The total economic benefits associated with the harvest of a species are, however, in general not solely determined by the total amount of harvest allowed. Other factors, including, but not limited to, the number of fishermen allowed to harvest the species, trip or bag limits, and seasonal restrictions affect the total benefits received. As a result, regulations may affect the total economic benefits received without significantly affecting the total harvest.

A discussion of the management reference points and harvest information for queen conch in the U.S. Caribbean is provided in Section 3.2.3. Because queen conch recreational harvest data is not collected in the U.S. Caribbean, neither the management reference points nor harvest totals provided in Section 3.2.3 contain recreational harvest components. The maximum sustainable yield (MSY) and overfishing limit (OFL) for queen conch in the U.S. Caribbean are 512,718 lb (Table 3.2.3.1), and were determined based only on commercial harvests (1999-2005 for Puerto Rico and St. Croix, and 2000-2005 for St. Thomas/St. John; see Section 3.2.3). The average annual commercial queen conch harvest in the U.S. Caribbean during 2009-2011 was 331,326 lbs (Table 3.2.3.1.2). As a result, the average annual queen conch commercial harvest for the period 2009-2011 was 181,392 lbs less than the MSY and OFL. If recreational harvest data were available, the MSY and OFL would be greater than 512,718 lb because the MSY and OFL are based on average annual harvests and adding harvest from a new harvest sector would increase the total. However, it cannot be stated with similar certainty whether the current total average annual queen conch harvest, including harvest by the recreational sector, would be less than, greater than, or equal to a revised MSY or OFL that incorporated harvest by the recreational sector because more recent recreational harvests could be greater than, less than, or equal to the average annual harvest during the period used to determine the MSY and OFL.

Both MSY and OFL are biological reference points and do not include consideration of economic benefits. As a result, the allowable harvest level and optimum yield, which incorporates economic considerations in their determination, may be less than or equal to the MSY or OFL. However, because satisfying the biological needs of a resource is part of the determination of optimum yield, total harvest should not exceed the MSY (or, in the case of queen conch in the U.S. Caribbean, the OFL because the MSY and OFL have been set equal).

As described above, the average annual commercial harvest of queen conch in the U.S. Caribbean has been less than the MSY (and OFL). This difference could be viewed from three perspectives: the difference is 1) consistent and necessary with the rebuilding plan; 2) an opportunity to increase commercial harvest; 3) a “cushion” to accommodate a potential increase in recent recreational harvest over historic harvest levels. Determination of which of these perspectives is most appropriate for queen conch is beyond the scope of this analysis.

With the discussion provided above as the foundation, the following paragraphs discuss the expected effects of the proposed alternatives on the economic benefits associated with the harvest of queen conch. In the following discussion, “commonwealth waters” is used for waters under the jurisdiction of Puerto Rico, “territorial waters” is used for waters under the jurisdiction of the USVI, and “state waters” is used collectively for non-EEZ waters in the entire U.S. Caribbean.

Alternative 1 would not change the commercial trip limit for queen conch harvest in the U.S. Caribbean EEZ. The current commercial trip limit in the EEZ is 150 queen conch per licensed commercial fisherman per day regardless of the number of licensed commercial fishermen on the fishing vessel. Although there is not a federal permit or license for queen conch, a valid commercial fishing license issued by Puerto Rico or the USVI is required for a person who fishes in the U.S. Caribbean EEZ and is not subject to the bag limit. The current commercial trip limit in the EEZ is more restrictive than the commercial limit in the USVI territorial waters if only one licensed commercial fisherman is on the vessel but is less restrictive if multiple licensed commercial fishermen are on the vessel because the limit in territorial waters is 200 queen conch per vessel regardless of the number of licensed commercial fishermen on board. With respect to Puerto Rico, the EEZ and commonwealth regulations both limit the number of queen conch to 150 per person, but Puerto Rico caps the vessel limit at 450 queen conch per day. As a result, the queen conch commercial limit in the EEZ is less restrictive than the commonwealth limit if more than three licensed commercial fishermen are on the vessel. However, queen conch harvest in the U.S. Caribbean EEZ is only allowed in the Lang Bank area off St. Croix (see Section 1.3) and commercial fishermen would not normally be expected to harvest queen conch off St. Croix and want to land their harvest in Puerto Rico. As a result, the primary effect of current queen conch commercial regulations in the EEZ on fishermen and associated businesses and communities derives from the prohibition of harvest in the EEZ off Puerto Rico and not the inconsistency in trip limits (notwithstanding the fact that a closure is effectively a zero trip limit).

Lower trip limits can also result in higher operating costs because fishermen would be forced to take more trips to harvest a given quantity of queen conch if the limit is binding. Alternatively, in lieu of taking more trips to maintain queen conch harvest, lower trip limits could cause fishermen to target other species such as reef fish. This would be expected to result in reduced revenue because if these other species are more highly valued, they would have been the original primary target. Increasing the trip limit, on the other hand, may allow a fisherman to take fewer total trips, maintaining their revenue from queen conch, but with reduced operating costs, or possibly substitute a less costly trip for alternative species and increase total net revenue.

The inconsistency between regulations in the EEZ and the USVI and the expectation that queen conch harvested in the Lang Bank area are landed in St. Croix may be resulting in reduced economic benefits for some fishermen. Although the limit in the EEZ is 150 queen conch per licensed commercial fisherman, the 200 queen conch vessel limit in territorial waters may be resulting in some fishermen on trips with multiple licensed commercial fishermen on board self-limiting their harvest in the EEZ to the lower quantity to avoid enforcement issues. Alternatively, enforcement difficulty in determining whether the queen conch were harvested in territorial or EEZ waters may be resulting in higher harvest in territorial waters than should occur, with associated economic consequences, such as early closure of the fishery as a result of

taking the quota too quickly. As shown in Section 1.6, trips have been recorded from territorial waters with harvest greater than 200 queen conch.

Continuation of the current limit under **Alternative 1** would not be expected to result in any change in the economic benefits associated with the commercial harvest of queen conch. However, as discussed above, depending on the biological needs of the species, the needs of the surrounding environment, and the amount of recreational harvest, these economic benefits could be less than or equal to their optimal level. A determination of which scenario is more likely to be true cannot be made with available information.

Because queen conch harvest in the U.S. Caribbean EEZ is only allowed in the Lang Bank area off St. Croix (see Section 1.3), **Preferred Alternative 2** and **Alternative 3** only consider modification of the queen conch commercial trip limit to establish consistency with the commercial trip limit for the USVI. **Preferred Alternative 2** would establish a vessel limit of 200 queen conch per day. Compared to **Alternative 1**, **Preferred Alternative 2** would increase the queen conch allowable harvest per day if only one licensed fisherman is on board the vessel, but would decrease the allowable harvest if multiple licensed fishermen are on board the vessel. If the biological needs remain protected, increasing the allowable harvest, in total and per trip, would be expected to increase the economic benefits associated with commercial harvest. Fishery-wide, increased harvest would equate to increased total revenues. At the individual commercial fisherman and trip level, increased limits allow more efficient vessel operation. Limits that are too high, however, could produce market gluts and shortened seasons, with associated price depression, reduced revenue, and increased harvest pressure on other species. Decreasing the allowable harvest would be expected to, logically, have the reverse effects.

Because **Preferred Alternative 2** would both increase and decrease the allowable harvest depending on the number of licensed commercial fishermen on board a vessel, the net expected economic effects of **Preferred Alternative 2** would depend on the amount of effort and harvest that normally occurs in the U.S. Caribbean EEZ, the proportion of trips that typically carry single and multiple licensed commercial fishermen, and the normal queen conch harvest per trip. A discussion of these parameters for the 2009/2010, 2010/2011, and 2011/2012 fishing years is provided in Section 1.6. As indicated in this discussion, the commercial data reporting requirements do not support robust assessment of the potential effects of the proposed alternatives. Although commercial trip reports are required, the data do not indicate whether queen conch landings are recorded as pounds of cleaned or uncleaned meat, thus creating uncertainty in the number of queen conch harvested per trip. Area fished is supposed to be reported, but not all reports contain this information. The trip reports also do not record the number of licensed commercial fishermen on board the vessel for the trip. Although it is possible to link trips by date of landing and vessel identification number and the assumption is made that such trips represent trips with multiple licensed commercial fishermen, an assessment

using this approach may not fully capture multiple fishermen trips because other trips may carry multiple licensed fishermen but record the harvest on a single report. Additionally, some recorded trips have had harvest in excess of the vessel limit. Although this may be the result of multiple licensed commercial fishermen being on the vessel, this could also be the result of a single licensed commercial fishermen exceeding the vessel limit.

Nevertheless, as discussed in Section 1.6, during the 2009/2010 through 2011/2012 fishing years, approximately 8 percent (uncleaned meat conversion rate of two queen conch per pound of meat; hereafter referred to as "uncleaned meat;" see Section 1.6) to 20 percent (cleaned meat conversion rate of three queen conch per pound of meat; hereafter referred to as "cleaned meat;" see Section 1.6) of trips that landed queen conch harvested in the EEZ landed more than 150 but less than 200 queen conch, and approximately 9 percent (uncleaned meat) to 21 percent (cleaned meat) landed more than 200 queen conch. These results indicate that approximately 83 percent of the EEZ trips landed 150 or fewer queen conch for uncleaned meat (100% - (8% + 9%) = 83%) and approximately 59 percent of the trips landed 150 or fewer queen conch for cleaned meat (100% - (20% + 21%) = 59%). This suggests an increase in the commercial trip limit to 200 queen conch per day, as would occur under **Preferred Alternative 2**, may allow a substantial increase in the rate of harvest of queen conch from the EEZ. However, these expectations would be tempered by consideration that the high portion of trips that do not exceed the current limit may be indicative that factors other than the limit, such as, but not limited to, stock abundance, skill, market demand, or choice, determine actual harvest per trip. Note that, as explained below, queen conch harvest from St. Croix waters is governed by a 50,000 lb quota.

As previously discussed, although **Preferred Alternative 2** would allow increased daily harvest for single fishermen, the allowable daily harvest would decrease if multiple licensed fishermen are on board a vessel. As discussed in Section 1.6, assuming records with the same landing date and vessel identification number indicate a vessel trip with multiple licensed commercial fishermen, 17 trips, or approximately 2 percent of the 978 trips with queen conch harvested in the EEZ and that carried two licensed commercial fishermen, were calculated to have occurred during the fishing years examined. For the reasons previously discussed, this estimate should be considered a lower bound. If the landed harvest on these trips is assumed to represent uncleaned meat, none of these trips landed more than 200 queen conch. If the landed harvest on these trips is assumed to represent cleaned meat, only one trip, or approximately 0.1 percent of total trips in the EEZ, landed more than 200 queen conch.

These results may suggest, despite the data issues, that the lower vessel limit in **Preferred Alternative 2** would only be expected to have a minor effect on commercial fishermen. However, as seen in Table 1.6.4, approximately 9 - 21 percent of the total trips that harvested queen conch in the EEZ landed more than 200 queen conch, depending on whether the reported landings were from uncleaned or cleaned meat (or a combination of the two; it should be noted

that the range in the estimated number of trips is an artifact of uncertainty over whether the queen conch are reported landed uncleaned or cleaned and the conversion of queen conch meat weight to numbers of queen conch; if landing condition was known, the estimated number of affected trips would be a point estimate). These trips would also be affected by **Preferred Alternative 2**. Although some of this harvest may be associated with single licensed commercial fishermen who manage to exceed the limit and avoid enforcement, the imposition of consistent limits is expected to aid enforcement and reduce the incidence of such behavior.

Because of the issues discussed, reliable estimates of the net economic effects of **Preferred Alternative 2** relative to **Alternative 1** cannot be estimated. However, because the incidence of trips with a single licensed commercial fisherman on the vessel is expected to dominate fishing practices for queen conch, **Preferred Alternative 2** would be expected to result in increased average daily harvest and associated revenue per trip, and potentially lower operating costs if fishermen take fewer trips. However, because queen conch commercial quota in St. Croix is limited to 50,000 lb (and the EEZ is closed to queen conch harvest when the St. Croix limit is reached, though this compatible closure authority has only been in effect since the 2011/2012 fishing year), any increase in the average harvest per trip can only result in an earlier closure, if quota closure is the norm, or an increase in the likelihood of a quota closure if closure is not already routine. This may result in market problems (product flow and price effects) and reduced income to fishermen. Although commercial fishermen who harvest queen conch rely, on average, on other species for the majority of their fishing revenue (approximately 84 percent of total average revenue for all queen conch fishermen with recorded landings in St. Croix during the most recent three fishing years combined came from other species, or approximately 89 percent for fishermen with recorded harvests in the EEZ; see Section 3.3.1), some fishermen may have more difficulty than others adjusting to an earlier closure of the queen conch commercial fishery. The proposed commercial queen conch vessel limit under **Preferred Alternative 2** would also be expected to reduce harvest and revenue for some fishermen. Because the fishery is quota managed, however, total commercial harvest should not increase. As a result, no long-term economic losses should occur as a result of delayed stock rebuilding. Because approximately two-thirds of the total queen conch harvest in St. Croix comes from territorial waters, an increased harvest rate accruing to an increase in the trip limit to 200 queen conch in the EEZ would not be expected to significantly reduce the length of the open season. Also, as seen in Table 1.6.2, St. Croix exceeded the queen conch commercial quota in the 2009/2010 and 2010/2011 fishing years, but the quota was not harvested in the 2011/2012 fishing year. St. Croix closed their commercial queen conch fishery due to reaching the quota in the 2008/2009 fishing year. Although the queen conch commercial quota was harvested in the 2009/2010 and 2010/2011 fishing years, St. Croix did not close their territorial waters. The absence of closure during these fishing years may be the result of delayed reporting and, if the timeliness of reporting improves, the frequency of closure may increase. As a result, despite performance during the 2011/2012 fishing year, the likelihood of accelerated quota closure due to increased

commercial harvest rates may be high. Therefore, the adverse economic effects associated with meeting the quota sooner may exceed the increased benefits associated with the higher revenue per trip and potential reduced operating costs. Available data, however, does not support a determination of which effects would dominate. As a result, it cannot be determined whether **Alternative 1** or **Preferred Alternative 2** would be expected to result in the most economic benefits.

Because **Alternative 3** would only result in a consistent queen conch vessel limit, and not a consistent limit for trips with a single licensed commercial fishermen, **Alternative 3** would be expected to result in fewer economic benefits than **Preferred Alternative 2**. Establishing a consistent vessel limit would only partially address enforcement concerns. Thus, any economic benefits accruing to this aspect of regulatory consistency would be lower under **Alternative 3** than under **Preferred Alternative 2**. With respect to effects on the harvest rate, **Alternative 3** would be expected to reduce the total average harvest rate compared to **Preferred Alternative 2**, thereby decreasing the rate at which the quota is harvested compared to both **Alternative 1** and **Preferred Alternative 2**. Thus, any adverse economic effects associated with harvesting the quota sooner, as may occur under **Preferred Alternative 2**, would not be expected to occur under **Alternative 3**. Because **Alternative 3** would be expected to reduce the rate at which the St. Croix commercial quota is harvested relative to **Alternative 1**, **Alternative 3** would be expected to result in increased economic benefits compared to **Alternative 1** associated with this aspect of evaluation. If the economic benefits of **Preferred Alternative 2** expected to accrue to the increased limit for individual licensed commercial fisherman dominate any adverse effects associated with quicker quota closure due to a higher rate of total harvest, the loss of these benefits under **Alternative 3** would be expected to result in a net reduction in economic benefits for **Alternative 3** relative to **Preferred Alternative 2**. Compared to **Alternative 1**, **Alternative 3** would be expected to result in increased economic benefits because of better regulatory consistency and reduction of the likelihood, and associated adverse economic effects, of quota closure. However, because the economic trade-offs between reducing vessel-level harvest for trips carrying multiple licensed commercial fishermen and reducing quota closure effects cannot be determined, the net economic effects of **Alternative 3** relative to **Alternative 1** can similarly not be determined.

4.1.4. Direct and Indirect Effects on the Social Environment

As discussed in Section 4.1.3, the following analysis does not attempt to distinguish whether an expected effect is a direct or an indirect effect. Instead, the focus of the discussion is simply to identify all the social effects that might reasonably be expected to occur. Nevertheless, as a general guide for the reader, an example of a direct effect would be a change in fishing behavior such as a change in the number of queen conch harvested as a result of altering the amount of

queen conch that can be harvested. Other effects would likely stem from this effect, thus becoming indirect effects. An example of an indirect effect could include an impact to the queen conch resource (and impact to the fishermen who depend on the resource) resulting from compatible or incompatible regulations.

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, alternatives predicting positive or negative economic effects are expected to have correlating positive or negative social effects.

As described in Section 1.5, the current harvest regulations for queen conch in the Caribbean are different in state and federal waters. The Lang Bank area off of St. Croix is the only area in the U.S. Caribbean EEZ with an allowable harvest of queen conch; therefore this effects analysis only includes the possible impacts to fishermen in St. Croix. When fishermen are discussed below, the discussion refers only to queen conch fishermen in St. Croix.

This action would impact those commercial queen conch fishermen and their helpers who fish in the EEZ off St. Croix. As presented in Section 3.3.2, between nine and 23 licensed commercial fishermen reported fishing for queen conch in the EEZ in the last three fishing years (2009/2010, 2010/2011, and 2011/2012; Table 3.3.2.2). It is also estimated that these licensed fishermen frequently work with two helpers onboard (although this could include licensed fishermen rather than helpers who are not licensed). Therefore, it is likely that this action might impact approximately 18 to 46 queen conch fishers (i.e., licensed fishers and unlicensed helpers) (includes the range of the number of licensed fishermen fishing in the EEZ multiplied by the number of helpers). This total number of fishers could be a conservative estimate in that more licensed fishermen (and also helpers that fish with them) than those reported, may fish in the EEZ. This action would likely impact both fishers and their families; in terms of the earnings for their commercial catch, earnings that helpers receive for their work, and their reliance on their catch as food, as many commercial fishermen in St. Croix keep part of their catch to consume as subsistence.

Alternative 1 would not modify the current trip limit for commercial harvest of queen conch in the EEZ. Thus, St. Croix fishers would be able to continue with their current behavior, harvesting the same amount of queen conch per trip (the status quo for the EEZ includes an allowance of no more than 150 queen conch per licensed fisher per day and does not include a

maximum total per vessel). If more than one licensed fisher is on board, fishers would be allowed to continue to harvest 150 queen conch per licensed fisher (for a possible catch total of more than 150 queen conch per vessel). This would benefit fishers who fish with other licensed fishermen and catch a combined total of more than 150 queen conch. Although, as explained in the analysis presented in Section 1.6, less than one percent of queen conch trips in the EEZ with two licensed fishermen included a catch of greater than 150 queen conch (includes one trip if the queen conch is reported as landed uncleaned or nine trips if the queen conch is reported as landed cleaned with a catch greater than 150 queen conch, Table 1.6.4). Therefore, it is likely that the continued ability to catch more than 150 queen conch per vessel may not impact a large number of fishermen. However, as mentioned in Section 1.6, it is a possibility that there were more queen conch trips that contained more than one licensed commercial fisherman, but only one fisherman reported the landings (for all fishers). Thus, there could be more fishermen than reported who would be positively impacted by the continued ability to catch more than 150 queen conch per vessel. **Alternative 1** would allow this benefit of no maximum catch for the vessel (except for the maximum catch of 150 queen conch per licensed fisher) to continue for fishermen who fish with other licensed fishermen.

Although the current trip limit includes an allowance of no more than 150 queen conch per licensed fishermen, there appears to be individual fishermen harvesting more than 150 queen conch. As shown in Table 1.6.4, out of the fishermen that fish alone, 7.6 percent of queen conch trips in the EEZ where the queen conch catch was assumed to be reported landed as uncleaned meat, include a catch of between 150 to 200 queen conch, and 9.3 percent include a catch of more than 200 queen conch. Out of the fishermen that fish alone, 20.2 percent of EEZ trips with queen conch assumed to be reported landed as cleaned include a catch of between 150 to 200 queen conch and 21.1 percent include a catch of more than 200 queen conch. These fishers could be negatively impacted by **Alternative 1** because their current catches per trip would continue to be out of compliance with regulations.

In **Alternative 1,** federal regulations would remain incompatible with territorial regulations in the USVI. This could contribute to a continued difficulty in enforcing regulations as territorial enforcement agents and the U.S. Coast Guard help in enforcing federal regulations (because NMFS does not have enforcement agents in the USVI). There could be continued confusion brought about by the difference between territorial and federal rules and the difficulty in discerning whether queen conch has been harvested in federal or territorial waters, such as if enforcement agents stop a fisher while transiting through territorial waters with numbers higher than the current limit in territorial waters, but the queen conch was caught in federal waters. Fishers could be penalized in such an example. The incompatibility in numbers and associated enforcement difficulty could also negatively impact the resource (in that fishers might be able to harvest more queen conch per trip than is currently allowed in territorial waters because of the confusion of incompatible regulations) especially given that queen conch is currently classified

as overfished and the species is undergoing rebuilding. This could ultimately negatively impact commercial and recreational queen conch fishermen because the trip limit would not provide the intended protection for the resource.

Preferred Alternative 2 would modify the trip limit for the commercial harvest of queen conch in the U.S. Caribbean EEZ to be consistent with the USVI limit (which includes a harvest allowance of no more than 200 queen conch per vessel per day). This modification would have a positive impact in that it would allow for easier enforcement because regulations would be compatible for queen conch in territorial and federal waters. This could have resulting positive benefits on the resource (because fishermen would not be able to incorrectly claim queen conch have been caught in federal waters in order to take advantage of the higher harvest level per vessel possible in **Alternative 1** when more than one licensed fisher is on board) and thus also on fishermen engaged in queen conch fishing. This ease in the complexity of regulations could also be positive for fishermen in that they would only be required to be familiar with one regulation for queen conch commercial fishing for both areas.

Preferred Alternative 2 is more restrictive than **Alternative 1** for fishers who fish with other licensed fishermen. Fishermen would be allowed 200 queen conch per vessel in **Preferred Alternative 2** rather than the 150 queen conch per licensed fisherman with no maximum amount per vessel (besides the 150 allowance per licensed fisher) allowed in **Alternative 1**. **Preferred Alternative 2** could negatively impact those fishermen who fish with other licensed fishermen and catch over 200 queen conch. However, as described in the analysis in Section 1.6, very few fishers who fished with other licensed fishermen caught more than 200 queen conch per trip (zero trips included a catch of more than 200 queen conch when assumed uncleaned and only one trip included a catch of more than 200 queen conch when assumed cleaned, Table 1.6.4). Although, it is possible that this is a conservative number and that there were more queen conch trips that contained more than one licensed fisherman, but where only one fisherman reported the landings.

Fishermen who fish alone or with unlicensed helpers would be able to catch a larger bag limit (50 more fish than **Alternative 1**) if desired and would likely be positively impacted by the proposed change in trip limit in **Preferred Alternative 2**. As detailed in Table 1.6.4, approximately 7.6 percent of trips with only one fisherman harvested over 150 to 200 queen conch when queen conch was assumed uncleaned and 20.2 percent of trips harvested over 150 to 200 queen conch when queen conch was assumed cleaned. These fishermen would likely benefit from **Preferred Alternative 2** because they would be able to continue harvesting at their current trip limit.

Alternative 3 would modify the trip limit to be partially compatible with the USVI queen conch regulations in that fishers would be allowed to harvest no more than 150 queen conch per vessel

per day if there is one licensed fisherman on board, or no more than 200 queen conch per vessel per day if more than one licensed commercial fisherman is on board. The allowance of 200 queen conch per vessel would be consistent with that of the USVI (although it would only apply if more than one licensed fisher is on board); however, the daily limit of 150 queen conch per vessel if only one licensed fisher is on board, would not be consistent with USVI regulations. This alternative would not solve the problem of incompatible regulations and the resulting enforcement issues because, although the vessel daily maximum would be compatible, the maximum allowable catch per licensed fisher would remain incompatible (if one fisher is onboard). Also, some fishermen would be required to change their behavior from the status quo (**Alternative 1**) which allows for a total catch larger than 200 queen conch per vessel if more than one licensed fisher is on board. However, as described above, very few fishers who fished with other licensed fishermen caught more than 200 queen conch per trip (zero trips included a catch of more than 200 queen conch when assumed uncleaned and only one trip included a catch of more than 200 queen conch when assumed cleaned, Table 1.6.4). Although, it is possible that there were more queen conch trips that contained more than one licensed fisherman, but only one fisherman reported the landings.

As discussed in detail in the economic effects in Section 4.1.3, because the commercial queen conch fishery has exceeded the total quota in the past, it is likely that a larger trip limit could contribute to an accelerated quota closure. A quota closure could negatively impact fishermen who are dependent on queen conch for their livelihood. Although queen conch fishermen typically fish for other species in addition to queen conch (see Figure 3.3.2.1), they could be dependent on queen conch for part of their income (and their mix of species that they depend on during certain times of the year) and for subsistence. It is likely that the larger the trip limit, the more likely that the quota could be reached at a quicker rate. Although, as also discussed in detail in Section 4.1.3, the majority of commercial landings are from territorial waters, rather than from the EEZ, so the trip limit established for the EEZ is less likely to severely impact the quota (than the trip limit for territorial waters). As discussed in detail in 4.1.3, the harvest quota would likely be reached quicker under **Preferred Alternative 2** and **Alternative 1**, than under **Alternative 3**.

The greatest social benefits would likely be achieved through **Preferred Alternative 2** which would establish compatible territorial and federal regulations in the USVI and would allow for a greater daily harvest in the EEZ for licensed queen conch fishermen who do not fish with other licensed fishermen. Although the harvest quota could potentially be reached quicker under this alternative, the compatible regulations and ability to harvest a larger number of queen conch for licensed fishermen who do not fish with other licensed fishermen, could be more important than the possibility of a quota closure (given that fishermen frequently fish for many other species).

4.1.5. Direct and Indirect Effects on the Administrative Environment

Alternative 1 is the no action alternative and would not change the current commercial trip limit in the EEZ. The administrative effects of **Alternative 1** are expected to be negative because it would not achieve compatibility with USVI regulations and therefore would continue current enforcement issues. As discussed in Section 2.2, current enforcement issues have to do with differences in the commercial and recreational harvest limits between USVI territorial waters and federal waters and transit through territorial and federal waters.

Preferred Alternative 2 proposes to establish a compatible commercial trip limit with the USVI, therefore from all of the alternatives it is the only one that fully addresses the purpose and need of this regulatory amendment. Although developing regulations to achieve compatibility presents an administrative burden, the net administrative effects of having compatible commercial regulations in USVI territorial waters and in federal waters are expected to be positive because it would facilitate the enforcement of such regulations. Enforcement could be facilitated due to consistent regulations, which allows for straightforward application of the law, and removes confusion as an excuse for non-compliance. This could translate into fewer false or unsupportable citations, less wasted time in the legal system, and better understanding and cooperation by the fishers.

Alternative 3 would be expected to have some negative administrative effects because it would not be completely compatible with the USVI and would not address current enforcement issues if only one fisherman is on board a vessel on a fishing trip.

In summary, modifying the commercial trip limit as proposed in **Preferred Alternative 2** and **Alternative 3** would add a short-term administrative burden to promulgate the required regulations to change the commercial trip limit. **Preferred Alternative 2** and **Alternative 3** may also result in additional administrative burdens for the preparation and distribution of education and outreach materials for commercial fishermen as well as for law enforcement officers to incorporate the new changes in the regulations.

Based on the discussion above, the alternatives that would benefit the administrative environment the most are **Preferred Alternative 2**, followed by **Alternative 3**, and **Alternative 1**.

4.2. Action 2: Modify the bag limit for the recreational harvest of queen conch in the U.S. Caribbean exclusive economic zone (EEZ).

Alternatives

Preferred Alternative 1: No Action

Alternative 2: 6 queen conch per person/day, 24 per vessel/day

Alternative 3: 6 queen conch per person/day, 12 per vessel/day

Alternative 4: 3 queen conch per person/day, 24 per vessel/day

The EEZ management subzone of St. Croix is the only area in federal waters where fishing for queen conch is currently allowed.

4.2.1. 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. This action proposes to modify the recreational bag limit for the harvest of queen conch in the U.S. Caribbean EEZ. Recreational harvest for queen conch in the EEZ appears to be minimal, instead occurring predominantly in territorial waters. As discussed in Section 4.2.1 for Action 1, the primary fishing method for queen conch is hand harvest, either through free diving or SCUBA diving, and this method is expected to have little to no adverse effects on the physical environment. For these reasons, none of the alternatives proposed in this action (**Alternatives 1**, **2**, **3**, and **4)** would be expected to directly affect the physical environment over the short- or long-term. Moreover, hand harvest of queen conch is not expected to have adverse impacts on EFH identified for the queen conch.

Preferred Alternative 1 is the no action alternative and would not change the current recreational harvest allowance in the EEZ established by the Queen Conch FMP. This bag limit consists of three queen conch per person per day, and if more than four persons are onboard, then a maximum of 12 queen conch per vessel per day. **Preferred Alternative 1** is not expected to have any indirect effects on the physical environment as it would not change any current fishing techniques or activities. Any other effects to the physical environment, which includes the EFH for other managed species, would be the same as in the present.

Alternative 2 would establish a compatible recreational bag limit with the USVI. This alternative would increase the current daily bag limit to six queen conch per person and a maximum of 24 per vessel. As in **Preferred Alternative 1,** hand harvest of queen conch is not expected to directly affect the physical environment. However, the potential for indirect effects on the physical environment would depend on the potential increase of interactions with the bottom (e.g., anchoring, illegal dumping of shells in the area) that an increase in the harvest would bring. However, the magnitude of the current effects with the current bag limit is

unknown, because, as discussed in Section 2.3, there is no system in place to monitor recreational harvest information.

Alternative 3 would implement a daily bag limit of no more than six queen conch per person and a maximum of 12 queen conch per vessel. Any possible indirect effects from this alternative would be similar to the ones previously discussed for **Preferred Alternative 1** and **Alternative 2**. **Alternative 3** has the same overall total allowance as **Preferred Alternative 1**.

Alternative 4 would modify the daily bag limit to allow for the harvest of three queen conch per person per day, or a maximum of 24 per vessel. The indirect effects of **Alternative 4** would depend on if and how the higher vessel allowance, as in **Alternative 2**, would cause an increase in the interactions with the bottom (e.g., anchoring, illegal dumping of shells on the sea floor). Because the magnitude of these interactions have not been quantified to date, it is not possible to make assumptions with the information available.

4.2.2. Direct and Indirect Effects on the Biological/Ecological Environment

Preferred Alternative 1 is the no action alternative and would not change the current recreational bag limit in the EEZ. Direct biological and ecological effects from **Preferred Alternative 1** would be related to the actual amount of fishing mortality occurring from this sector that is not quantified. As discussed in Section 2.3, the recreational harvest of queen conch is not currently monitored in the USVI, only the commercial harvest is monitored, and both the commercial and recreational sectors are managed based on the catch that occurs in the commercial sector. When the St. Croix territorial/federal commercial quota is reached, harvest for both the commercial and recreational sectors is closed both in federal and in territorial waters. The absence of an explicit recreational harvest quota creates the potential for recreational fishers to harvest at a more rapid rate with no cap (i.e., quota) on that harvest, thereby increasing harvest to an undefined degree. Biological effects from **Preferred Alternative 1** are expected to be positive because this alternative has the added advantage of supporting the queen conch rebuilding plan by constraining the recreational harvest at a lower daily harvest rate. Because there is no cap for the total recreational harvest, and no tracking of recreational queen conch harvest in the U.S. Caribbean, this daily harvest constraint is the only constraint on recreational harvest while the fishing season is open.

Alternative 2 would increase the recreational daily bag limit in the St. Croix EEZ to six queen conch per person and a maximum of 24 per vessel, compatible with USVI limits. As discussed in Section 2.3 and above, the recreational harvest of queen conch is not currently monitored in

the USVI. Instead, the commercial harvest is monitored, and the fishery is closed when the commercial quota is reached. For the St. Croix management area, the established ACL quota is assumed to be sufficient at the moment to prevent overfishing from occurring. An increase in the recreational harvest, as proposed in **Alternative 2**, would not be reflected in the landings, and therefore would not be addressed by the St. Croix ACL quota. The absence of an explicit recreational harvest quota has the potential for recreational harvesters to harvest at a more rapid rate thereby increasing harvest to an undefined degree. Negative biological effects could be expected from this alternative, if doubling the amount of recreational harvest results in overfishing of the queen conch and compromises stock rebuilding efforts. This could also have the potential to affect the overall U.S. Caribbean OFL estimate because of the interconnectedness of the queen conch stock. An increase in the recreational harvest per trip could result in the overall OFL being approached and potentially exceeded, which could reduce the effectiveness of the rebuilding plan for the queen conch.

Alternative 3 would establish a daily bag limit of six queen conch per person and a maximum of 12 queen conch per vessel. This alternative is partially compatible with the USVI territorial bag limit in the number of queen conch that can be harvested per person. **Alternative 3** would put a cap on the daily harvest rate by limiting that number to 12 queen conch per vessel, which is identical to the current recreational vessel limit in federal waters, though, that maximum daily limit would now be available to two fishers rather than requiring four fishers. Biological effects from **Alternative 3** are expected to be partially positive because this alternative would constrain the recreational harvest at a lower daily harvest rate, supporting the queen conch rebuilding plan. Because there is no cap (i.e., quota) for the total recreational harvest, and no tracking of recreational queen conch harvest in the U.S. Caribbean, this daily harvest constraint is the only presently functional constraint on recreational harvest. However, because **Alternative 3** also proposes to double the allowed personal daily harvest from what is currently allowed, in the absence of a recreational harvest quota, this has the potential, as **Alternative 2**, for individual recreational fishers to harvest at a more rapid rate thereby increasing harvest to an undefined degree. This would be expected to negatively affect the biological environment by potentially compromising stock rebuilding efforts. The biological benefits of the lower vessel limit in **Alternative 3** could be offset by the disadvantages of a higher individual daily limit, depending on the number of persons that would be on a particular queen conch fishing trip on a certain day. Compared to **Preferred Alternative 1**, this alternative has the shortcoming that with only two persons on board, the maximum harvest would still be 12 queen conch versus the four persons that would be needed to reach the maximum in **Preferred Alternative 1**.

Alternative 4 would establish a daily bag limit of three queen conch per person and a maximum of 24 per vessel. This alternative is also partially compatible with the USVI territorial limits, because it sets the total daily bag limit per vessel at 24 queen conch. **Alternative 4** sets an individual limit of three queen conch instead of the six queen conch proposed in **Alternatives 2**

and **3**. Although this alternative has a higher vessel limit, the restriction on fishing per person could constrain the harvest of queen conch to lower levels, because there would need to be eight persons on board a vessel to harvest the maximum of 24 queen conch. Biological effects from **Alternative 4** are expected to be partially positive because this alternative would constrain the individual recreational harvest at the same lower daily harvest rate as in **Preferred Alternative 1**, supporting the queen conch rebuilding plan. However, because **Alternative 4** also proposes to double the daily allowed harvest per vessel, in the absence of a recreational harvest quota this has the potential, as discussed for **Alternative 2**, to negatively affect the biological environment by potentially resulting in overfishing of queen conch and compromising stock rebuilding efforts. This increase may result in the overall OFL (commercial and recreational) being approached more rapidly and potentially exceeded, which could potentially reduce the effectiveness of the rebuilding plan for the queen conch. These effects may occur at a lower level than would be expected in **Alternative 2**, because twice as many fishers are required for the maximum harvest to be reached and this would depend on fishery practices of this sector (e.g., passenger load of a recreational trip). The biological benefits of the lower individual limit in Alternative 4 could be offset by the disadvantages of a higher daily vessel limit, depending on the number of persons that would be on a particular queen conch fishing trip on a certain day.

Protected species and/or critical habitat for these species could be affected by fishery actions that increase interactions between fishing gear and the species, increase bycatch, and/or that increase, reduce, or redistribute fishing effort to areas where protected species and/or critical habitat occurs. As in Action 1, this action has little potential for direct biological effects on listed species. Queen conch harvest is only conducted by hand, which makes it easy for divers harvesting queen conch to avoid interacting with listed species if they are encountered. Green, hawksbill, and leatherback sea turtle critical habitat is not anticipated to be affected by the harvest of queen conch. As discussed in Section 3.2.4, indirect effects from the queen conch fishery are limited to potential effects to *Acropora* critical habitat. The direct removal of herbivore species such as the queen conch may affect grazing activities that keep the macroalgae at an optimum level. An overgrowth of macroalgae may affect coral recruitment. Because the recreational harvest is not monitored and the level of recreational harvest is currently unknown, the indirect effects on *Acropora* critical habitat from any of the alternatives in this action will depend on whether or not they result in overfishing of queen conch. Those alternatives that keep the harvest low, **Preferred Alternative 1** and to some extent **Alternative 4**, would be more beneficial to the biological environment of *Acropora* than those alternatives that allow a higher harvest (**Alternative 2** and **Alternative 3**).

Management actions that affect the role of the species within its habitat have the potential of affecting the biological and ecological environment. Similar to Action 1, the effect of Action 2 on the biological/ecological environment, which includes the EFH, for other managed species would depend on how much the queen conch biomass in the area would be affected by the

harvest allowances proposed in the different alternatives. For example if the effect of the proposed alternatives on the EFH of other species were to be analyzed, **Preferred Alternative 1** is the "status quo," thus the effect would remain the same as present. **Alternatives 2-4** would be expected to decrease the effect on EFH to different degrees because the daily harvest, either the individual or the vessel limit, would be increased from what is currently allowed. Because recreational harvest is not monitored, recreational fishers could increase harvest to an undefined degree. Additionally, as discussed in Section 3.1.3.2, removing the queen conch shell affects the available shell habitat (i.e., EFH) used by other invertebrates and fish in their juvenile and adult stages as refuge or place for attachment. Therefore the impact on the biological/ecological environment, which includes the EFH, for other managed species, although it may be significant, cannot be quantified at the moment because there is no information about the specific type of habitat in Lang Bank (federal waters) where queen conch is recreationally fished.

To summarize, because **Preferred Alternative 1** would constrain the recreational harvest at a lower daily harvest rate than any of the other alternatives, it offers the best protection to the biological environment because it constrains daily and total recreational harvest to the greatest degree, and therefore best supports the queen conch rebuilding plan (although the degree to which the rebuilding plan may be affected is unknown). **Alternative 2** would allow the largest daily and total increase in recreational harvest by increasing both the individual and vessel limits, potentially hindering the success of the rebuilding plan. However, although **Alternative 2** is the only alternative that fully addresses the purpose and need of this regulatory amendment, this alternative was not selected as a preferred because of the potential effects mentioned above. **Alternatives 3** and **4** would both increase the daily recreational harvest rate (individual or vessel limit**)** and their effects would depend on the actual number of recreational participants on a trip.

4.2.3. Direct and Indirect Effects on the Economic Environment

As discussed in Section 4.1.3, the following analysis does not attempt to distinguish whether an expected effect is a direct or an indirect effect. Instead, the focus of the discussion is simply to identify all the economic effects that might reasonably be expected to occur.

As discussed in Section 4.1.3, management measures should be consistent with the biological needs of a resource, associated environment, and achieving optimum yield. This implies restricting harvest if biological and environmental needs are not met, or allowing increased harvest if economic benefits are reduced as a result of overly restrictive regulation. Participation, bag, size, seasonal, or areal limits should be consistent with allowable harvest limits, both in total and by sector.

As described in Section 1.5, the recreational bag limit in the U.S. Caribbean EEZ is the same as the bag limit in the commonwealth waters of Puerto Rico, but is more restrictive than the bag limit in the territorial waters of the USVI. If a species can support increased harvest, more restrictive regulations in the EEZ compared to state waters would be expected to result in reduced (foregone) economic benefits. Alternatively, if total harvest exceeds the biological requirements, more restrictive regulations in the EEZ may reduce the magnitude of the adverse effects of the excessive harvest that would otherwise occur. Thus, more restrictive regulations in the EEZ compared to the regulations in state waters could, result in foregone economic benefits or reduce the economic losses associated with excessive harvest.

Preferred Alternative 1 would not change the queen conch recreational bag limit in the U.S. Caribbean EEZ. The queen conch recreational bag limit in the EEZ is three queen conch per fisherman per day or 12 queen conch per vessel if more than four persons are on board. The queen conch recreational bag limit in the USVI territorial waters is six queen conch per fisherman or 24 queen conch per vessel per day, and the commonwealth limit in Puerto Rico is the same as the limit in the EEZ. As discussed in Section 4.1.3 however, queen conch harvest in the U.S. Caribbean EEZ is only allowed in the Lang Bank area off St. Croix (see Section 1.3) and recreational fishermen, similar to commercial fishermen, would not normally be expected to harvest queen conch off St. Croix and want to land their harvest in Puerto Rico. As a result, the primary effect of current queen conch regulations in the EEZ on recreational fishermen and associated businesses and communities derives from the prohibition of harvest in the EEZ off Puerto Rico, St. Thomas, or St. John, and not any inconsistency in trip limits (notwithstanding the fact that a closure is effectively a zero trip limit).

Alternatively, if queen conch harvest could be increased and rebuilding goals still met, continuation of the current queen conch recreational bag limit in the EEZ under **Preferred Alternative 1** would be expected to result in continued foregone economic benefits to fishermen and associated businesses and communities because the more restrictive limit would impede increasing recreational and total queen conch harvest in the U.S. Caribbean.

Because queen conch harvest in the U.S. Caribbean EEZ is only allowed in the Lang Bank area off St. Croix, **Alternatives 2-4** would affect the queen conch recreational bag limit in this area. **Alternatives 2-4** would, to different extents, increase the recreational queen conch bag limit in the U.S. Caribbean EEZ. Depending on the status of the total queen conch harvest relative to the biological needs and the rebuilding plan, these alternatives would either increase the forfeiture of long-term economic benefits in favor of higher short-term economic benefits, if current harvest is already too high, or reduce the amount of economic benefits forfeited in the short- and long-term as a result of overly restrictive regulations. **Alternative 2** would be expected to result in the largest potential increase in the recreational harvest of queen conch because it would increase both the individual and vessel limit. **Alternative 3** and **Alternative 4** cannot be similarly ranked

because they alternate in increasing either the individual or vessel limit and the number of recreational trips carrying different passenger loads (two fishermen, three fishermen, four fishermen, etc.) is not known.

Inconsistent regulations in EEZ and state waters may have economic consequences associated with enforcement. Fishermen who harvest in the EEZ must transit state waters to land their catch. If limits are higher in the EEZ than in state waters, if stopped by enforcement agents, fishermen may be unable to prove their harvest, if in excess of the state limits, occurred in the EEZ, resulting in associated penalties. To avoid these problems fishermen may be forced to self-limit their harvest in the EEZ to the lower state limits, thereby avoiding enforcement issues, but reducing the economic benefits they should otherwise be able to receive from the higher EEZ limits. These problems are not expected to arise in the case of queen conch in the U.S. Caribbean, however, because for all proposed alternatives the bag limit in the EEZ is lower than or equal to the bag limit in the USVI territorial waters.

Ranking **Alternatives 1-4** in terms of the expected economic effects is not possible with current information. As previously discussed, the absence of recreational harvest information prevents estimation of the resource-level MSY, tabulation of total harvest by all sectors, and determination of whether current total harvest is consistent with the rebuilding plan and optimizing economic benefits. Because each of **Alternatives 2-4** would be expected to result in increased harvest relative to **Preferred Alternative 1**, regardless of the status of total harvest relative to the unknown resource-level reference points and allowable harvest, each alternative would be expected to increase the likelihood that the allowable harvest level is exceeded. Because **Alternative 2** would increase both the individual and vessel limit, **Alternative 2** would clearly increase the likelihood that the allowable harvest level is exceeded more than **Alternative 3** and **Alternative 4**. As previously stated, **Alternative 3** and **Alternative 4** cannot be similarly ranked. Alternatively, if current harvest is sufficiently less than the total allowable harvest, which is unknown, then **Alternative 2** would be expected to result in the largest increase in economic benefits by allowing the greatest harvest increase. If current harvest already exceeds the total allowable harvest, then **Preferred Alternative 1** would be expected to result in the highest economic benefits.

4.2.4. Direct and Indirect Effects on the Social Environment

As discussed in Section 4.1.3, the following analysis does not attempt to distinguish whether an expected effect is a direct or an indirect effect. Instead, the focus of the discussion is simply to identify all the social effects that might reasonably be expected to occur.

As described in Section 1.5, the current harvest regulations for queen conch in the Caribbean are different in state and federal waters. The Lang Bank area off St. Croix is the only area in the Caribbean EEZ with an allowable harvest of queen conch, therefore this effects analysis only includes the possible impacts to fishermen in St. Croix. When fishermen are discussed below, the discussion refers only to queen conch fishermen in St. Croix. This action would impact those recreational queen conch fishermen who fish in the EEZ off of St. Croix.

Preferred Alternative 1, no action, would not modify the recreational bag limit for queen conch in the U.S. Caribbean EEZ (bag limit currently consists of three queen conch per person per day, or if more than four persons are aboard, 12 queen conch per vessel per day). This is the most restrictive alternative in that it allows for a harvest of fewer queen conch per person per day (**Alternative 4** also allows for the same number per person, however it includes a larger allowance per vessel and **Alternative 2** and **Alternative 3** include a larger bag limit of six queen conch per person per day) and/or allows for a smaller maximum number of queen conch per vessel per day than the other alternatives being considered (**Alternative 2** and **Alternative 4** allow for a maximum of 24 queen conch per vessel per day). This status quo bag limit would allow recreational fishermen to continue to harvest in their accustomed manner and would not require that they alter their behavior when fishing recreationally for queen conch in the EEZ.

However, because the recreational catch is not recorded or monitored (and the recreational harvest is shut down only when the commercial ACL is reached), **Preferred Alternative 1** is the alternative that would likely provide the best protection for the resource (in that it would allow fewer queen conch to be caught recreationally per day in the EEZ than the other alternatives) and is the alternative that is least likely to contribute to overfishing.

Alternatives 2-4 would increase the recreational bag limit to varying amounts in the EEZ and it is possible that this could increase the recreational rate of harvest. This increase in the rate of harvest could further contribute to overfishing. The recreational harvest of queen conch in the EEZ may already be more than the current USVI recreational harvest limits, however there is no way to validate this information because recreational landings are not monitored. If the USVI harvest limits are already being exceeded (or are close to being exceeded) and the rate of harvest is increased, this could negatively impact the resource. Thus, this could negatively impact commercial and recreational queen conch fishermen in St. Croix.

Alternative 2 would likely provide the greatest immediate benefit to fishermen in that they would be able to harvest the largest number of queen conch per day and per vessel (six queen conch per person per day, with a maximum of 24 queen conch per vessel per day). **Alternative 3 (**six queen conch per person per day, with a maximum of 12 queen conch per vessel per day) and **Alternative 4** (three queen conch per person per day, with a maximum of 24 queen conch per vessel per day) would likely provide the next greatest immediate benefit to fishermen

depending on the desired catch of queen conch per fisherman and the desired number of fishermen per vessel. If a larger catch per fisherman is desired then **Alternative 3** would be more beneficial, however if a larger number of fishermen per vessel is desired, then **Alternative 4** would be more beneficial. Since the fishing practices of queen conch recreational fishermen are not known, it cannot be determined whether **Alternative 3** or **Alternative 4** would positively impact recreational fishermen to a greater degree. Any increase in catch per fishermen could contribute to benefits to fishermen's families in the form of subsistence. Although **Alternatives 2-4** could provide recreational fishermen with positive benefits (a larger bag limit per fisher and/or per vessel) in the short term, it is likely that these alternatives could contribute to overfishing.

Alternative 2 would provide compatible regulations between territorial and federal waters and thus would provide an ease in enforcement (as discussed in detail in Section 4.1.4 for the commercial trip limit action). This benefit is not likely to outweigh the possible consequences of increasing the recreational rate of fishing. It is possible that in the status quo (**Preferred Alternative 1**) when fishermen are encountered by enforcement, some recreational fishermen in the EEZ could take advantage of the fact that the territorial regulation allows for a greater take of queen conch per fisherman and per vessel. These fishermen could claim that their catch was harvested in territorial waters, as it is difficult to discern the catch area unless the catch area is witnessed by enforcement. Therefore, it is possible that some recreational fishermen are already harvesting the amount of queen conch allowed in territorial waters, but are harvesting from the EEZ.

The fewest long term negative impacts to commercial (commercial fishermen are included because an increase in the recreational catch could impact the queen conch resource and thus could impact commercial queen conch fishermen) and recreational queen conch fishermen would likely be achieved through **Preferred Alternative 1**. **Alternatives 2-4** would increase the recreational bag limit to varying amounts and given that the recreational harvest is not known, there is a good possibility that these larger bag limits have the capacity to do harm to the resource in the long term. Although a larger bag limit would provide immediate positive benefits to recreational fishermen and their families, there exists the possibility of harm to the resource (and thus to the fishermen that depend on the resource) in the long term.

4.2.5. Direct and Indirect Effects on the Administrative Environment

Preferred Alternative 1 is the no action alternative and would not modify the current recreational bag limit in the EEZ as established in the Queen Conch FMP. Although the current federal bag limit is within the limit allowed in territorial waters, administrative effects from this alternative are expected to be negative in the short and long term because it would not achieve

compatibility with USVI regulations and therefore continue current enforcement issues. Compatibility could only be achieved if the territorial government revised their recreational bag limit to be consistent with the federal bag limit. As discussed in Section 2.2, current enforcement issues have to do with differences in the bag limit between USVI territorial waters and federal waters and transit through territorial and federal waters. It appears there is little to no known recreational fishing for queen conch in the EEZ, as it mostly occurs in territorial waters, however the amount of harvest that occurs in territorial waters or EEZ waters is not monitored. Indirect administrative effects from **Preferred Alternative 1** would be related to the actual amount of harvest from this sector that is not quantified and thus is not counted for ACL purposes, but this information is unknown. However, as discussed in Section 3.2.1 (or elsewhere), although only commercial harvest is monitored, the 50,000 lb ACL set for queen conch in the EEZ serves as a proxy for the harvest that is occurring in both sectors of the fishery. The established ACL is intended to prevent overfishing from occurring.

Overall, **Preferred Alternative 1** has a lower bag limit than the other alternatives, and because the recreational harvest in the USVI, as well as in Puerto Rico, is unknown and it is not monitored, keeping the recreational harvest low because of all the uncertainty associated with this would be a better precautionary measure that would prevent disrupting the balance that was used to establish the ACL and the OFL. This would avoid having to take administrative actions later to account for this. Although the need to establish compatible regulations for enforcement purposes is reasonable, the current condition of the queen conch may not justify an increase in harvest limits.

Establishing a compatible recreational bag limit as proposed in **Alternative 2**, would directly benefit the administrative environment. Although developing regulations to achieve compatibility presents an administrative burden in the short term (this regulatory amendment), the net administrative effects of having compatible regulations in USVI territorial waters and in federal waters are expected to be positive because it would facilitate the enforcement of such regulations. As discussed in Section 2.2, current enforcement issues have to do with differences in the commercial and recreational harvest limits between USVI territorial waters and federal waters and transit through territorial and federal waters. Enforcement and prosecution would be facilitated due to consistent regulations, which allows for straightforward application of the law, removes confusion as an excuse, and clarifies prosecution. This would translate into fewer false or unsupportable citations, less wasted time in the legal system, and better understanding and cooperation by the fishers.

As discussed in Section 2.2, the St. Croix queen conch season closes when the commercial quota reaches 50,000 lbs, but this harvest quota does not include data on recreational landings. Despite this, fishing for all sectors is closed when that quota is reached, both in federal and in territorial waters. Increasing the bag limit, as proposed in **Alternative 2**, could create or enhance a race for

queen conch that would not be reflected in the landings, and therefore would not be addressed by the St. Croix ACL. Increasing the bag limit, as proposed in **Alternative 2**, could potentially change the balance that was used to establish the ACL for the St. Croix management area, as discussed for **Preferred Alternative 1**. This would add an administrative burden to revise the current ACL to see if it would still be a reasonable proxy for the amount of fishing that occurs in both sectors, and if overfishing would result as a product of doubling the amount of recreational harvest allowed as proposed in **Alternative 2**. Increasing the bag limit as proposed by this alternative could result on the overall OFL (commercial and recreational) being approached more rapidly and potentially exceeded, and therefore potentially reducing the effectiveness of the rebuilding plan for the queen conch (established in 2005), affecting the administrative environment.

Alternative 3 and **Alternative 4** would increase either the individual daily bag limit (**Alternative 3**), or the daily vessel limit (**Alternative 4**). Both alternatives were proposed as options to limit the total number of queen conch that can be harvested per day, while keeping partial compatibility. However, the administrative effects of **Alternative 3** and **Alternative 4** are expected to be negative as none of them would fully address current enforcement issues by not being fully compatible with the USVI. **Alternative 3** also proposes to double the allowed individual harvest, increasing the harvest rate, and this harvest is not monitored. However, this alternative would maintain 12 queen conch per the vessel cap. Any increased harvest would not be reflected in the landings, and as discussed for **Alternative 2**, it could potentially affect the St. Croix ACL and the estimated U.S. Caribbean wide OFL. This could result in adverse administrative effects from having to revise the current ACL to reflect the additional harvest. Other measures would also need to be taken if overfishing results as a product of doubling the amount of recreational harvest. This is expected to happen as well for **Alternative 4** because this alternative would allow for an increased maximum vessel limit of 24 queen conch.

Choosing any of **Alternatives 2-4** would also have the administrative problem of how to determine an appropriate bag limit that takes into account the current status of the queen conch as overfished and the balance used to estimate the St. Croix ACL, given that there is no recreational data available to estimate the real contribution of the recreational harvest to the total amount of landings.

Modifying the recreational bag limit as proposed in **Alternatives 2**, **3,** or **4** would add a short-term administrative burden to promulgate the required regulations. Modifying the recreational bag limit under either **Alternative 2**, **Alternative 3**, or **Alternative 4** may also result in additional administrative burdens for the preparation and distribution of education and outreach materials for recreational fishermen as well as for law enforcement officers.

In summary, because there is no cap for the total recreational harvest, and no tracking of recreational queen conch harvest in the U.S. Caribbean, **Preferred Alternative 1** would constrain the recreational harvest at the lowest daily harvest rate of any alternative. Thus, it would provide greater net administrative benefits relative to **Alternatives 2**, **3** and **4** because it supports the queen conch rebuilding plan (although the level that it is affected is unknown) and thus no other administrative measures would be needed in the short term. Although the need to establish compatible regulations for enforcement purposes is reasonable, as proposed by **Alternative 2**, the current overfished condition of the queen conch may not justify an increase in harvest limits. The effects of **Alternatives 3** and **4** would depend on the fishery practices of the recreational sector (e.g., number of fishers per boat on a trip) but this information is currently unknown.

4.3 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.
2. Establish the geographic scope of the analysis.
3. Establish the timeframe for the analysis.
4. Identify the other actions affecting the resources, ecosystems, and human communities of concern.
5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.
6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.
7. Define a baseline condition for the resources, ecosystems, and human communities.

8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.
9. Determine the magnitude and significance of cumulative effects.
10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.
11. Monitor the cumulative effects of the selected alternative and adapt management.

This CEA for the biophysical environment will follow a modified version of the 11 steps. Cumulative effects for the socio-economic environment will be analyzed separately.

4.3.1. Effects to the Biological Environment

1) Identify the significant cumulative impacts 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. The primary area that would be affected by the actions in this regulatory amendment is the federal waters off the east end of St. Croix, 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, in particular fishing communities of the island of St. Croix. These are discussed in Sections 3.3.2 and 3.3.2. A detailed description of the geographic range for queen conch, the species primarily affected by this regulatory amendment can be found in Section 3.2. The ranges of other protected species affected are described in Section 3.2.4.

3) Establish the timeframe for the analysis.

The timeframe for the CEA should take into account both historical efforts to manage queen conch, as well as future considerations if this regulatory amendment and its subsequent regulation are approved and implemented by NMFS. The timeframe for the CEA begins with the implementation of the Queen Conch FMP in 1997 and extends through 2020, which is when

the timeframe for the Rebuilding Plan for the queen conch concludes. Long-term evaluation is needed to determine if management measures have the intended effect of facilitating enforcement in the St. Croix management area and improving population health as a result.

Queen conch in the U.S. Caribbean EEZ have been managed since 1996 as part of the conch resources fishery management unit (FMU) of the Queen Conch FMP (CFMC 1996, implemented in 1997, 61 FR 65481). Sections 1.5.1 and 1.5.2 describe the history of management for conch resources in U.S. Caribbean federal waters and USVI waters.

Biological and socio-economic information in this amendment is updated until the last actions concerning queen conch resources, which was through the 2010 Caribbean ACL Amendment (CFMC 2011a) and the 2011 Caribbean ACL Amendment (CFMC 2011b). The 2010 Caribbean ACL Amendment established an ACL for queen conch harvest in the EEZ, amended framework measures for the Queen Conch FMP, and revised management reference points (MSY, OY, OFL, ABC) for queen conch in federal waters of the U.S. Caribbean. The 2011 Caribbean ACL Amendment removed eight species of conch from the Queen Conch FMP, leaving only the queen conch (*Strombus gigas*) in the FMP.

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 queen conch.

Past

The CEA included in the 2010 Caribbean ACL Amendment (CFMC 2011a) analyzes cumulative effects to the queen conch. This CEA described the effects of the establishment of annual catch limits, accountability measures, and the redefinition of management reference points for queen conch 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, and contribute to the long-term health of the ecosystem while reinvigorating sustainable fisheries. The CEA also discuss that the actions in that amendment would not affect the restriction on fishing for queen conch in federal waters of the U.S Caribbean, which is only allowed in an area off St. Croix, USVI, and that same as with this regulatory amendment, only queen conch fishers of St. Croix could be affected. Other actions discussed in the CEA included Regulatory Amendment 1 to the Queen Conch FMP (CFMC 2010) which established compatible closures with USVI, and how that action in combination with the 2010 Caribbean ACL Amendment, was not expected to add additional impact to queen conch fishers of St. Croix or their families and communities because less conch fishing occurs in federal waters. Other actions analyzed in that CEA included queen conch regulations implemented by Puerto Rico and the USVI for their state waters, and the impact of natural and human disasters, as well as

socioeconomic changes that could affect the resources, ecosystems, and communities of Puerto Rico and the USVI. The analysis of cumulative effects listed in the 2010 Caribbean ACL Amendment is still considered to be accurate and useful at the present time.

Present and Reasonably Foreseeable Future

A proposal to develop FMPs specific to each island or island group (e.g., Puerto Rico, St. Croix, St. Thomas/St. John) is currently under consideration. This action could affect the way the queen conch is managed in the U.S. Caribbean, as management could be tailored to each island or island group.

The physical, biological, social, economic, and administrative effects of modifying the queen conch commercial trip limit and recreational bag limit in the EEZ are analyzed in Chapter 4 of this document.

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.pdf.

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 queen conch directly affected by the regulations, and those species (i.e., *Acropora* spp.) that are indirectly affected by the regulations.

The species that would be directly impacted by the action proposed in this regulatory amendment is the queen conch (*Strombus gigas*). Information on the queen conch physical, biological, ecological, social, and economic environments is provided in Chapter 3 of this document.

The queen conch stock of the U.S. Caribbean was reviewed in 2007 by the Southeast Data, Assessment, and Review program (SEDAR 14, NMFS 2007). This review determined the queen conch stock to be overfished with overfishing continuing to occur. The latest report on the status of U.S. fisheries (NMFS Status of U.S. Fisheries, 4th Quarter 2012) classifies queen conch as overfished, but not undergoing overfishing anymore. This change in status is because queen conch reported catches have been dropping steadily over the last few years, reducing the catch

below the established OFL. The queen conch is currently in the 8th year of a rebuilding plan designed to rebuild the stock by 2020.

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 queen conch were identified in the 2005 SFA Amendment (CFMC 2005). Numerical values of thresholds for the queen conch such as MSY proxy, OY, and OFL were updated in the 2010 Caribbean ACL Amendment (CFMC 2011a), as discussed in Section 3.2.3 of this document. The 2010 Caribbean ACL Amendment became effective in January 2012. At the time of preparation of this environmental assessment, the 2010 Caribbean ACL Amendment values for the management reference points were still valid.

Stresses affecting queen conch include habitat quality and anthropogenic threats (e.g., habitat loss and degradation, sedimentation, pollution, water quality, overharvest). Queen conch are particularly sensitive to the quality of their environment. Any changes in benthic conditions resulting from land based increases in sedimentation or turbidity will adversely affect the available productive habitat (Appeldoorn et al. 2011). Environmental changes (e.g., potential threats from climate change, ocean acidification) can also affect queen conch populations. How global climate change will affect queen conch is presently unknown (Prada et al. 2008). Appeldoorn et al. (2011) argue that changes in climate may have direct implications for the harvest of queen conch. The authors discuss that the exact length of the spawning season is temperature dependent with the vast majority of spawning activity occurring during the months of July – September. However, in Puerto Rico, Florida, and other locations where minimum winter temperatures have been trending upward, queen conch now spawn year round, thus making them vulnerable to harvest for longer periods of time (Appeldoorn et al. 2011).

Excess carbon dioxide (CO_2) dissolves into the ocean and is converted to corrosive carbonic acid, a process known as "ocean acidification." At the same time, the CO_2 also supplies carbon that combines with calcium already dissolved in seawater to provide the main ingredient for shells, calcium carbonate ($CaCO_3$), the same material found in chalk and limestone (Oceanus

2013). Organisms that exert low biological control over calcification directly deposit $CaCO_3$ along their inner shell walls, and consequently, they depend on a sufficient ambient carbonate concentration to accumulate 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). The net responses of organisms to rising CO_2 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 CO_2 (Cooley and Doney 2009). Increased ocean acidity caused by elevated CO_2 could directly damage organisms (e.g., clams, oysters, conch) by partially dissolving their shells (Oceanus 2013, https://www.whoi.edu/oceanus/viewArticle.do?id=52990). For example, in a controlled experiment to test how different organisms respond to ocean acidification, Ries (2010) found that when a species of conch (i.e., *Strombus aleatus* – Florida fighting conch*)* was exposed to high CO_2 concentrations, the shell noticeably deteriorated.

The specific 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 over the 21st century (Climate Change 2007). The actions in this regulatory amendment are not expected to increase or decrease the potential impacts of global climate change and ocean acidification on queen conch 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 queen conch, please see SEDAR 14 (NMFS 2007), the 2010 Caribbean ACL Amendment (CFMC 2011a), and the history of management and biological environment sections of this regulatory amendment (Sections 1.5 and 3.2, respectively). The information included in NMFS (2007) and CFMC (2011a) was reviewed and found to be relevant. SEDAR 14 describes general management information for the queen conch (status, stock exploitation status, stock biomass status), specific management criteria (MSY, OY), stock rebuilding information (rebuilding schedule), regulatory history, and biological and life history descriptions, among other (NMFS 2007). Section 5.2.1.1 of the 2010 Caribbean ACL Amendment describes baseline biological conditions for the queen conch in Puerto Rico and the USVI including biology and life history. Section 1.5 of this regulatory amendment and environmental assessment provides a description of the history of management in federal waters until the last regulatory action for the queen conch, which was the 2011 Caribbean ACL Amendment (CFMC 2011b). The history of management of queen conch in

USVI waters is also described. Section 3.2.1 describes the biology and ecology of the queen conch in general and in the U.S. Caribbean, a description of the fishery, as well as a discussion on the current status of the queen conch. The most recent status of the queen conch is summarized in the report to Congress on the Status of U.S. Fisheries (NMFS Status of U.S. Fisheries, 4th Quarter 2012). The queen conch was determined to be overfished in that report.

Protected species in the affected environment are described in Section 3.2.4 of this regulatory amendment, and include sea turtles, marine mammals, and corals. The status and health of EFH for the queen conch has been extensively described (CFMC 1998, 2004, 2011c). The Council, NMFS, and other federal 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 (Table 4.3.1).

Table 4.3.1. The cause-and-effect relationship of fishing for queen conch and regulatory actions within the time period of the Cumulative Effects Assessment (CEA).

Time Period /Dates	Cause (Management Action)	Observed and/or Expected Effects
Effective date January 1997	**Queen Conch FMP (CFMC 1996)** 1) Minimum Size limits: 9 inches (22.9 cm) in length, that is, from the tip of the spire to the distal end of the shell, and 3⁄8 inch (9.5 mm) in lip width at its widest point. 2) Required that all species in the management unit be landed in the shell and prohibited the sale of undersized queen conch and queen conch shells. 3) Trip and Bag Limits: Recreational bag limit of 3 queen conch/day for recreational fishers, not to exceed 12 per boat. Commercial trip limit of 150 queen conch/day for licensed commercial fishers. 4) Seasonal Closure: Closed the harvest season coincident with the peak spawning periods: From July 1 through September 30, each year, no person may fish for queen conch in the Caribbean EEZ and no person may possess on board a fishing vessel a queen conch in or from the Caribbean EEZ. 5) Gear Prohibition: No harvest of queen conch by HOOKAH gear in the EEZ.	Reduce mortality of queen conch, protect immature individuals, protect spawning populations during peak spawning seasons, protect deep-water spawning stock.

Time Period /Dates	Cause (Management Action)	Observed and/or Expected Effects
Effective date November 2005	**Comprehensive Sustainable Fisheries Act Amendment (CFMC 2005)** 1) Prohibit fishing for or possessing on board a fishing vessel a Caribbean queen conch in or from the Caribbean EEZ, except during October through June in the area east of 64°34'W longitude which includes Lang Bank, east of St. Croix, USVI. 2) Defined reference points for the queen conch. 3) Established a rebuilding schedule for queen conch of 15 years. 4) Designated EFH and HAPCs for queen conch; 5) Moved all species of Caribbean conch, with the exception of queen conch, to a data collection only category. 6) Queen conch in or from the Caribbean EEZ must be maintained with meat and shell intact. 7) Developed a Memorandum of Understanding between NMFS and the governments of Puerto Rico and USVI to develop compatible regulations.	Reduce fishing mortality and help rebuild the overfished stock of Caribbean queen conch. Queen conch would be rebuilt to B_{MSY} in 15 years, using the formula T_{MIN} (10 years) + one generation time (5 years) = 15 years. Describe and identify EFH according to functional relationships between life history stages of federally managed species and Caribbean marine and estuarine habitats. Remove fishery management restrictions on other conch species moved to data collection. Achieve cooperative management and compatible regulatory regimes.
Effective date May 2011	**Regulatory Amendment 1 Queen Conch FMP (CFMC 2010)** 1) Extended the 3-month closure in Federal waters to a 5-month closure, compatible with USVI. 2) Implemented a compatible queen conch harvest quota closure for Federal waters of St. Croix.	Prevent additional fishing pressure on queen conch in the U.S. Caribbean, and improve enforcement of regulations affecting the queen conch resource by improving compatibility among federal and territorial regulations.
Effective date January 2012	**2010 Caribbean ACL Amendment (CFMC 2011a)** 1) Established ACLs and accountability measures (AMs) for queen conch. ACL St. Croix management area (EEZ) = 50,000 lb (22,680 kg) ACL = 0 for Puerto Rico and St. Thomas/St. John. 2) Established framework measures for the queen conch FMP.	Prevent overfishing of queen conch while maintaining catch levels consistent with achieving optimum yield (OY).
Effective date January 2012	**2011 Caribbean ACL Amendment (2011b)** Removed eight species of conch from the Queen conch FMP.	Remove from management those species the Council determined there was no need for federal conservation and management.
Target date 2013	**Regulatory Amendment 2 Queen Conch FMP (this regulatory amendment)** Modify commercial and recreational harvest limits for the harvest of queen conch in federal waters.	Achieve compatibility of regulations with the USVI to facilitate enforcement efforts in the region, enhance compliance by the fishers, and allow for more efficient management of queen conch resources in the U.S. Caribbean.

9) Determine the magnitude and significance of cumulative effects.

The management actions in this regulatory amendment (Chapter 2) propose to modify the commercial and recreational harvest limits for queen conch in the EEZ. Because the only area of the EEZ open to queen conch harvest if off St. Croix, the actions would affect the St. Croix management area. These management actions have the intention of achieving compatibility of regulations between the USVI and federal waters. Action 1 of this amendment addresses commercial harvest limits, and Action 2 addresses the recreational limits. The queen conch is currently classified as overfished and is currently part of a rebuilding plan and measures taken should ensure the continuous health of the queen conch resource.

Chapter 4 of this document discusses the magnitude and significance of the proposed actions and alternatives on the queen conch resource. After careful consideration, the Council decided to modify the commercial trip limit but leave the recreational bag limit unchanged. Changing the commercial trip limit is not expected to cause or contribute to direct or indirect significant impacts on the biological and physical environment. The advantages of compatible commercial regulations would be facilitation of enforcement by allowing for straightforward application of the law, and removing confusion as an excuse for non-compliance. This could result in fewer false or unsupportable citations, less wasted time in the legal system, and better understanding and cooperation by the fishers.

Other management measures taken in the past such as the establishment of a seasonal closure, the closure of areas in the EEZ to fishing for queen conch, commercial and recreational harvest limits, an annual catch limit, and compatible quota closures in combination with the action proposed in this regulatory amendment are intended to prevent or greatly reduce the risk of overfishing and are expected to have positive long-term biological benefits. 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 the queen conch resulting from changing the commercial trip limit from an individual limit to a vessel limit. However, queen conch fisherman usually fish for other species (e.g., reef fish, lobster, pelagics) and additional impacts on these species are not expected to be significant. Other activities conducted in the EEZ, such as research activities and fishing for other species, 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.

The modification of the commercial trip limit in Action 1 of this regulatory amendment is not expected to directly adversely affect the biological environment, and is not expected to have significant cumulative effects, therefore there is no need to modify or add alternatives to avoid,

minimize, or mitigate significant cumulative effects. In summary, the action is expected to have a short-burden on the administrative environment with the preparation of the regulations. The no action alternative would avoid this short- administrative burden, however it would not achieve the purpose of this regulatory amendment which is to aid enforcement in the EEZ off St. Croix, USVI. Indirect effects on the biological environment are unavoidable and are part of the operation of the fishery itself and would not change if the proposed action in this amendment is implemented or not. The other alternative proposed (**Alternative 3**), would not adversely affect the biological environment, however, because it is only partially compatible with USVI queen conch territorial regulations, it would not achieve the purpose and need of this regulatory amendment.

For Action 2, proposed **Alternatives 2-4** could have adverse negative effects on the biological environment that could not be quantified with the information available at the moment. The no action alternative (**Alternative 1**) would avoid these negative effects because it would not result in changes that could compromise the long term health of the queen conch resource. Therefore, the Council decided to not modify the recreational bag limit. In addition, taking no action would not provide any additional advantage to on-the-water enforcement of the bag limit because the recreational limit in federal waters is within the limit in USVI territorial waters. Administrative effects are not expected from Action 2 because no action will be taken.

To ensure queen conch stocks are managed for optimum yield (OY), periodic reviews of stock status are needed. These reviews are designed to incorporate new information and to address unanticipated developments in the fishery and would be used to make appropriate adjustments in the regulations should harvest not achieve OY objectives. These assessments would be requested as needed by the SEDAR Steering Committee. Reviews of the queen conch population should benefit from updated landings information through Puerto Rico commonwealth, USVI territorial, and federal fishery monitoring programs to be implemented in the future. Additionally, NMFS and other government agencies support research on this species by federal, state, academic, and private research entities.

Actions that the Council could employ to manage the queen conch resource beyond modifying commercial and recreational trip limits, include, but would not be limited to, reducing the fishing season, establishing a permit system to limit the number of fishers in federal waters, restrictions on gear use, and/or other area closures. The Council has several options for implementing these measures. The first is to amend the Queen Conch FMP to include new information and management actions. The second method is a regulatory amendment.

The Council can also request NMFS to take other management actions through emergency or interim measures. Emergency actions and interim measures can be implemented only under limited circumstances. They only remain in effect for 180 days after the date of publication of

the rule and may be extended by publication in the *Federal Register* for one additional period of not more than 186 days provided the public has had an opportunity to comment on the emergency actions and interim measures. The Magnuson-Stevens Act further states that when a Council requests that an emergency action and interim measure be taken, the Council should also be actively preparing plan amendments or regulations that address the emergency on a permanent basis.

11) Monitor the cumulative effects of the selected alternative and adopt management.

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

4.3.2. Effects to the Socio-Economic Environment

The social and economic environment affected by the proposed action is described in Section 3.3 and is incorporated herein by reference. A description of the history of management of the queen conch resources is contained in Section 1.5. Fishing communities that are directly dependent on queen conch are described in detail in the 2010 and 2011 Caribbean ACL Amendments (CFMC 2011a, b) and summarized in Section 3.3.2 of this regulatory amendment. The CEA in the 2010 Caribbean ACL Amendment analyzed cumulative effects for the queen conch and described baseline economic and social conditions for fishing communities in Puerto Rico and the USVI (CFMC 2011a). This information was reviewed and found to be relevant, and is incorporated herein by reference. For example, economic stresses that affect the fishermen such as additional costs to fishing or lower ex-vessel prices for harvested fish are discussed in the CEA. In addition, the CEA discussed that the ability of fishers and communities to withstand any potential adverse impact caused by management actions in federal waters, such as the one proposed by this regulatory amendment, depends greatly on their reliance in fishing in federal waters. As discussed previously in this document, most of the queen conch fishing is conducted in territorial waters of St. Croix, with only approximately 28 percent of reported queen conch landings in St. Croix coming from the EEZ. 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.

Commercial and recreational fishermen, and associated businesses and communities, receive economic benefits from the harvest of queen conch. These economic benefits take the form of revenue and profits to fishermen, consumer surplus to recreational fishermen, revenue and profits

to businesses that support both commercial and recreational harvest, and economic stability to communities where these activities occur and services are provided.

As described in Section 1.5, the current queen conch harvest regulations in the U.S. Caribbean are not uniform across all sectors or areas of harvest. Management measures should be 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.

The Council chose to modify the commercial trip limit in the EEZ and leave the recreational bag limit unchanged. The St. Croix fishing communities would be directly affected as a result of the action and preferred alternative proposed herein. However, the net economic effects of the proposed action cannot be quantified with available data, as discussed in detail in Section 5.4 of this document. In addition, indirect effects of the proposed action could be a slight increase in fishing for, and revenue from, other species if fishermen are able to take fewer trips for queen conch to harvest the quota and increase trips for other species. Neither the revenue from queen conch nor the revenue from all species harvested by queen conch commercial fishermen would be expected to change substantially from their historic averages.

Social impacts could include impacts to the daily level of harvest for commercial and recreational fishermen, to the larger fishery resource and resulting available annual quota (if the stock is damaged by overfishing from an increased recreational harvest which is not monitored), and to the ability to enforce and follow regulations. If the commercial quota is met quicker by an increased trip limit this could negatively impact fishermen; however, fishermen could also be impacted by incompatible regulations.

A detailed description of the expected economic and social impacts of the actions in this regulatory amendment is contained elsewhere in Sections 4.1.3, 4.1.4, 4.2.3, and 4.2.4, and is incorporated herein by reference.

4.4 Council Conclusions

The Caribbean Fishery Management Council (Council), at its 143rd Meeting (August 28-29, 2012), directed staff to develop a document with management options and alternatives to make all queen conch regulations in the U.S. Caribbean EEZ consistent with USVI territorial regulations.

An Options Paper was presented at the 144th Council meeting (December 19-20, 2012) held in St. Thomas, USVI. The Council discussed two options, Option 1, which proposed to establish a compatible commercial trip limit with the USVI, and Option 2, which proposed the establishment of a recreational bag limit compatible with the USVI. At this meeting, the Council requested that a regulatory amendment with these two options be prepared in time for the 145th Regular Council meeting to be held in March 2013, with the intention of conducting public hearings and taking final action at that meeting and having the regulations in place in time for the start of the next queen conch harvest season in November 2013.

Public hearings were conducted on March 25, 2013 in St. Croix, USVI. A summary of the public hearing and its outcomes can be found in Appendix B of this document. In summary, for Action 1 (Commercial Trip Limit) participants at the public hearings supported **Alternative 2**, which would establish a compatible trip limit with the USVI. For Action 2 (Recreational Bag Limit), participants commented that there is not a lot of fishing in federal waters, as it mostly occurs in territorial waters, and also that they would like the USVI to become compatible with the federal regulations which are more restrictive. A participant also supported **Alternative 2**, which proposed a recreational bag limit compatible with the USVI.

The Council conducted its 145th Regular Meeting on March 26-27, 2013, in St. Croix, USVI. During this meeting, the Council discussed the comments received during the public hearings, presented and discussed the actions and alternatives, and listened to comments from meeting participants. The Council reviewed all of the alternatives for both actions and selected preferred alternatives. For Action 1 (Commercial Trip Limit) the Council selected **Preferred Alternative 2**, which established a compatible trip limit with the USVI consisting of 200 queen conch per vessel per day. The Council determined that this alternative would aid enforcement efforts in St. Croix, because it would reduce confusion among fishers and increase law enforcement efficiency, without risking the health of the queen conch resource. For Action 2 (Recreational Bag Limit), the Council decided to leave the recreational bag limit unchanged, thus chose **Alternative 1**, the no action alternative, as the preferred. The Council decided to maintain the lower federal bag limit because increasing the bag limit does little to assist law enforcement and may have negative consequences with respect to the continued health of the queen conch resource. During this meeting, the Council approved this regulatory amendment for submission to the Secretary of Commerce.

Chapter 5. Regulatory Impact Review

5.1 Introduction

The National Marine Fisheries Service (NMFS) conducts a Regulatory Impact Review (RIR) as required by Executive Order 12866, as amended. The RIR: (1) Provides a comprehensive review of the incidence and level of impacts associated with a proposed or final regulatory action; (2) provides a review of the problems and the policy objectives prompting the regulatory proposals and an evaluation of alternatives that could be used to solve the problem; and (3) ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way.

The RIR provides the information needed to determine if the proposed regulations constitute a significant regulatory action under Executive Order 12866.

5.2 Problems and Objectives

The purpose and need of this action are discussed in Section 1.4. In summary, this action is intended to establish compatible regulations for the commercial and recreational harvest of queen conch between the U.S. Caribbean exclusive economic zone (EEZ) and U.S. Virgin Islands (USVI) territorial waters to allow more efficient management and enforcement of queen conch regulations.

5.3 Description of the Fishery

A description of the fishery is contained in Chapter 3.3.

5.4 Impacts of the Proposed Action

A complete discussion of the expected economic effects of the proposed actions and the alternatives considered is contained in Sections 4.1.3 and 4.2.3. Although there are two actions, one that addresses commercial queen conch harvest and one that addresses recreational queen conch harvest, the Caribbean Fishery Management Council (Council) selected the no action

alternative for the action that addresses recreational harvest. As a result, the following summary only addresses the expected effects of the proposed change in harvest restrictions for the commercial sector.

The proposed action, **Preferred Alternative 2**, would increase the number of queen conch that could be harvested per vessel per day if one licensed commercial fisherman is on board the vessel and decrease the allowable harvest if multiple licensed commercial fishermen are on board. However, because two percent or fewer of trips that harvest queen conch are believed to carry multiple licensed commercial fishermen, the effects of increasing the allowable queen conch harvest per vessel per day would be expected to dominate. Increasing the number of queen conch that could be harvested per vessel per trip would be expected to increase the average daily harvest and associated revenue per trip, and potentially lower operating costs if fishermen take fewer trips. Total revenue from queen conch would not be expected to change, however, because the queen conch commercial quota in St. Croix is limited to 50,000 pounds (lbs) and the EEZ is closed to queen conch harvest when the St. Croix limit is reached. Total revenue to affected fishermen could increase if fishermen take fewer trips for queen conch, because of an increase in the number of queen conch harvested per trip and subsequent quota closure, and take more trips for, and receive increased harvest and revenue from, other species. Because the total queen conch commercial harvest is limited by quota, an increase in the average harvest per trip may result in an earlier closure or an increase in the likelihood of a quota closure. This may result in market problems, such as disruption of product flow and reduced price if market gluts develop, which may reduce income to fishermen from queen conch. However, quota closure has only occurred once since the 2008/2009 fishing year and because approximately two-thirds of the total queen conch harvest in St. Croix comes from territorial waters, any increased harvest rate accruing to the proposed increase in the trip limit in the EEZ would not be expected to significantly reduce the length of the open season and, thus, may have minimal to no effect on queen conch prices.

The net economic effects of the proposed action cannot be quantified with available data. However, the total average annual (fishing year) revenue from queen conch from 2009/2010 through 2011/2012 was only approximately $405,000 (nominal dollars) and approximately $2.58 million for all species harvested by fishermen who harvested queen conch. Because queen conch commercial harvest is limited by quota and the proposed action would not affect the total allowable commercial harvest, the total average annual revenue from queen conch harvest would not be expected to be affected other than as a result of a possible reduction in average price if increased harvest rates result in a market glut. Fishing for, and revenue from, other species may increase slightly, as constrained by regulations on these species, if fishermen are able to take fewer trips for queen conch to harvest the quota and substitute trips for other species. As a result, neither the revenue from queen conch nor the revenue from all species harvested by queen

conch commercial fishermen would be expected to change substantially from their historic averages.

5.5 Public and Private Costs of Regulations

Costs associated with this action include:

Council costs of document preparation, meetings, public hearings, and information dissemination $20,000

NMFS administrative costs of document preparation, meetings, and review .....$ 50,000

Law enforcement costs 0

TOTAL.....$ 70,000

5.6 Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a "significant regulatory action" if it is likely to result in: (1) An annual effect of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive order. Based on the information provided above, this regulatory action has been determined to not be economically significant for the purposes of E.O. 12866.

Chapter 6. Regulatory Flexibility Act Analysis

6.1 Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration. The RFA does not contain any decision criteria; instead, the purpose of the RFA is to inform the agency, as well as the public, of the expected economic impacts of various alternatives contained in the fishery management plan (FMP) or amendment (including framework management measures and other regulatory actions) and to ensure that the agency considers alternatives that minimize the expected impacts while meeting the goals and objectives of the FMP and applicable statutes.

With certain exceptions, the RFA requires agencies to conduct a regulatory flexibility analysis for each proposed rule. The regulatory flexibility analysis is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. In addition to analyses conducted for the Regulatory Impact Review (RIR), the regulatory flexibility analysis provides: (1) a statement of the reasons why action by the agency is being considered; (2) a succinct statement of the objectives of, and legal basis for the proposed rule; (3) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; (4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; (5) an identification, to the extent practical, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule; and (6) a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

In addition to the information provided in this section, additional information on the expected economic impacts of the proposed action is included in Chapters 4 and 5.

6.2 Statement of Need for, Objectives of, and Legal Basis for the Rule

The purpose and objectives of this proposed action are presented in Section 1.4. In summary, this proposed action is intended to establish compatible regulations for the commercial and recreational harvest of queen conch between the U.S. Caribbean exclusive economic zone (EEZ) and U.S. Virgin Islands (USVI) territorial waters to allow more efficient management and enforcement of queen conch regulations. The Magnuson-Stevens Fishery Conservation and Management Act provides the statutory basis for this proposed action.

6.3 Identification of All Relevant Federal Rules Which May Duplicate, Overlap or Conflict with the Proposed Rule

No duplicative, overlapping, or conflicting Federal rules have been identified.

6.4 Description and Estimate of the Number of Small Entities to Which the Proposed Rule will Apply

This proposed action is expected to directly apply to commercial fishermen in St. Croix that harvest queen conch. The Small Business Administration (SBA) has established size criteria for all major industry sectors in the U.S. including fish harvesters. A business involved in fish harvesting is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $4.0 million (NAICS code 114111, finfish fishing) for all its affiliated operations worldwide.

Queen conch harvest in the EEZ of the U.S. Caribbean is restricted to the Lang Bank area off St. Croix and all queen conch harvest from this area is believed to be landed in St. Croix because of the travel distances that would be required to land in St. Thomas, St. John, or Puerto Rico. As a result, the assessment of the number of commercial entities expected to be affected by this proposed action is based on St. Croix commercial trip ticket data. The USVI fishing year is July 1 through June 30. During the 2009/2010 through 2011/2012 fishing years, the number of fishermen per fishing year that recorded landings of queen conch in St. Croix ranged from 48 fishermen in 2009/2010 to 30 fishermen in 2011/2012, and averaged 40 fishermen per fishing year. The average total revenue per fishing year from the harvest of all marine species (queen conch and all other species harvested) by these fishermen during this period was approximately

$2.6 million (nominal or un-inflated dollars), or approximately $64,000 per fisherman ($2.6 million/40). These estimates include all fishermen with recorded queen conch landings in St. Croix, regardless of where the queen conch were harvested (EEZ or territorial waters). Precise estimates of comparable values for fishermen who harvested queen conch in the EEZ are not available because the area of harvest was not provided on all trip tickets (area fished was not reported on trips tickets that accounted for approximately 11 percent of the average queen conch harvest per fishing year). However, an average of 17 fishermen (range of 9 - 23) per fishing year reported queen conch harvests from the EEZ. The average total revenue from the harvest of all marine species by these fishermen during this period was approximately $1.0 million (nominal or un-inflated dollars), or approximately $60,000 per fishermen ($1.0 million/17). Both average revenue estimates, approximately $64,000 and approximately $60,000, are significantly lower than the SBA threshold. As a result, all commercial fishermen expected to be affected by this proposed action are determined, for the purpose of this assessment, to be small business entities.

6.5 Description of the Projected Reporting, Record-keeping and Other Compliance Requirements of the Proposed Rule, Including an Estimate of the Classes of Small Entities Which will be Subject to the Requirement and the Type of Professional Skills Necessary for the Preparation of the Report or Records

This proposed action would not establish any new reporting, record-keeping, or other compliance requirements.

6.6 Significance of economic impacts on small entities

Substantial number criterion

This proposed action would be expected to affect 30 - 48 commercial fishing entities. All of these entities are believed to be small entities. An estimated 218 commercial fishing entities operate in St. Croix. The number of commercial fishing entities expected to be affected by this proposed action would comprise approximately 14 – 22 percent of all commercial fishing entities. This proposed action would, therefore, be expected to affect a substantial number of small entities.

Significant economic impacts

The outcome of "significant economic impact" can be ascertained by examining two issues: disproportionality and profitability.

Disproportionality: Do the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities?

All entities expected to be affected by this proposed action are believed to be small entities. As a result, the issue of disproportionality does not arise.

Profitability: Do the regulations significantly reduce profit for a substantial number of small entities?

The proposed action would increase the number of queen conch that could be harvested per vessel per trip if one licensed commercial fisherman is on board the vessel and decrease the allowable harvest if multiple licensed commercial fishermen are on board. However, two percent or fewer of trips that harvest queen conch are believed to carry multiple licensed commercial fishermen. As a result, the effects of increasing the allowable queen conch harvest per vessel per trip on trips with a single licensed commercial fisherman on board would be expected to dominate.

The net direct economic effects of the proposed action cannot be quantified with available data. Increasing the number of queen conch that could be harvested per vessel per trip would be expected to increase the average daily harvest and associated revenue per trip. Total operating costs could be lowered if fishermen take fewer trips to harvest the queen conch quota. An increase in the revenue per trip and a decrease in operating costs would result in an increase in profit to affected small entities.

The queen conch commercial quota in St. Croix is limited to 50,000 lbs and the St. Croix portion of the EEZ is closed to queen conch harvest when the St. Croix limit is reached. As a result, the total average annual revenue to all commercial fishermen from queen conch harvest would not be expected to be affected other than as a result of a possible reduction in average price if increased harvest rates result in a market glut. However, of the estimated average 40 fishermen who harvest queen conch per year in St. Croix waters, only an estimated average of 17 fishermen harvest queen conch in the St. Croix portion of the EEZ. Additionally, quota closure has only occurred once since the 2008/2009 fishing year and because approximately two-thirds of the total queen conch harvest in St. Croix comes from territorial waters, any increased harvest rate accruing to the proposed increase in the trip limit in the EEZ may not significantly reduce the length of the open season and, thus, may have minimal to no effect on queen conch prices. As a

result, an increased harvest rate accruing to the proposed action may have only a small effect on increasing the likelihood of quota closure and/or reducing the average price for queen conch.

In addition to the effects described in the previous paragraph, fishing for, and revenue from, other species may increase as a result of this proposed action if fishermen are able to take fewer trips for queen conch to harvest the quota and increase trips for other species. However, any increase in revenue from the harvest of other species would be an indirect effect of the proposed action and, therefore, outside the scope of the RFA.

Thus, the average fisherman directly affected by this proposed action would be expected to experience an increase in revenue and profit. However, the significance of these increases cannot be determined with available data.

6.7 Description of Significant Alternatives

Although the significance of the expected change cannot be determined, the proposed action would be expected to increase the revenue and profit of the average small entity that would be expected to be affected. Because the expected effect would be positive and not adverse, the issue of significant alternatives to minimize the adverse effects of the proposed action is not relevant.

Chapter 7. List of Preparers

Table 7-1. 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
Stephen Holiman	NMFS/SF	Economist
Christina Package	NMFS/SF	Anthropologist
Calusa Horn	NMFS/PR	Fishery Biologist
Michael Larkin	NMFS/SF	Data Analyst
Jennifer Doerr	NMFS/SEFSC	Fishery Biologist
Mara Levy	NOAA/GC	Attorney
Anik Clemens	NMFS/SF	Technical Writer
David Keys	NMFS/SER	Regional NEPA Coordinator
Juan Agar	NMFS/SEFSC	Economist
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 8. List of Agencies 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
USVI 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)

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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. Pursuant to Section 515 of Public Law 106-554 IQA, this information product has undergone a pre-dissemination review by the NMFS Southeast Regional Office, Sustainable Fisheries Division.

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 completed the most recent 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 the 2005 biological opinion on all U.S. Caribbean fisheries remained valid (NMFS 2005). The memorandum also determined the queen conch fishery was not likely to adversely affect *Acropora* or their critical habitat. It stated that 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 were discountable. The memorandum did not consider potential indirect effects on *Acropora* critical habitat that may occur because of the removal of queen conch, which is an herbivorous species that may contribute to grazing activities that keep the macroalgae at an optimum level. NMFS is evaluating this potential indirect effect and will complete any required Section 7 analysis prior to promulgation of a final rule implementing this regulatory amendment.

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 queen conch resources fishery are considered Category III (76 FR 73912), meaning annual mortality and serious injury

of marine mammals in the queen conch fishery 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 area affected by the proposed action has been identified as EFH for queen conch, spiny lobster, corals, and reef fish. The proposed action would affect the queen conch fishery in St. Croix EEZ waters. As specified in the Magnuson-Stevens Act, EFH consultation is required for federal actions which may adversely affect EFH. NMFS has determined that the proposed action would not adversely affect EFH because the queen conch fishery is conducted by hand-harvest

and this results in a minimum adverse effect to EFH. In the context of the fishery as a whole, the results of this regulatory amendment will not have an adverse impact on EFH, therefore, an EFH consultation is not required. The basis of this determination is described in a memorandum dated May 2, 2013, contained in the file.

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.

The RFA analysis is found in Chapter 6 of this document.

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. The RIR for this action is found in Chapter 5 of this document.

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 3.3.3 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 regulatory 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.

Queen conch harvest has the potential to indirectly affect coral reefs by removing an herbivorous species that may contribute to grazing activities that keep the macroalgae at an optimum level. However, the action in this regulatory amendment does not change the commercial harvest limitation already in place. Further, NMFS is currently evaluating a potential indirect effect of removing queen conch on *Acropora* critical habitat, as required under Section 7 of the ESA, and will complete any required analysis prior to promulgation of a final rule implementing this regulatory amendment.

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. A marine protected area within the Lang Bank in St. Croix (Red Hind Spawning Aggregation East of St. Croix), is located in federal waters of the U.S. Caribbean that will be affected by the actions in this regulatory amendment. However, the proposed action is not expected to adversely affect resources within this MPA.

Appendix B. Public Hearing Location and Summary

The Caribbean Fishery Management Council (Council), during its 145th Regular Meeting (March 26-27, 2013) discussed the comments received during the public hearing held the evening of March 25, 2013 in St. Croix, USVI. No additional comments were received during the 145th meeting.

The Public Hearing for this Regulatory Amendment was held at the following location and date:

ST. CROIX, USVI
March 25, 2013
The Buccaneer Hotel,
5007 Estate Shoys, Christiansted,
St. Croix, USVI 00820.

Council staff and NMFS staff attended the meeting. Three deponents provided comments. For Action 1 (Commercial Trip Limit), in general participants supported **Alternative 2**, the establishment of compatible commercial regulations with the USVI. For Action 2 (Recreational Bag Limit), a participant supported **Alternative 2**, which would establish a compatible recreational bag limit with the USVI, while another participant suggested that the USVI territorial government should adopt the current recreational limit in federal waters. A participant also expressed that public hearings should be held in St. Thomas to discuss recreational alternatives. Other comments received at the public hearing are listed below.

1.	The recreational harvest of queen conch in the exclusive economic zone (EEZ) is unknown: 99% occurs in territorial waters.
2.	Require federal permit to fish queen conch in the EEZ. Require specific reporting (e.g., clean/unclean meat %).
3.	Diver safety: commercial and recreational divers lost at sea, require safety surface buoy while diving, with identification and permit number.
4.	Act 3330 defines helpers for traps and seines, more effort in the queen conch fishery.
5.	HOOKAH is prohibited in the USVI (correction to the document*).
6.	Enforcement: there is a black market for queen conch during the closed season. There might be issues with underreporting queen conch landings (e.g., 30,000 lbs in 2011).
7.	Port sampling needs to be increased and include both commercial and recreational harvest.

* During the 145th Meeting, the USVI representatives indicated that the use of HOOKAH gear is prohibited in the Territory, however this measure is not stated in the USVI regulations.