Framework Action 3 under the Puerto Rico Fishery Management Plan: Modification of Status Determination Criteria and Management Reference Points for the Triggerfish Stock Complex based on the SEDAR 80 Queen Triggerfish Stock Assessment

Including a Draft Regulatory Flexibility Act Analysis

Draft Version 1

April 2024

Abbreviations and Acronyms Used in this Document

ABC	acceptable biological catch
ACL	annual catch limit
CEA	cumulative effects analysis
CFMC	(Council); Caribbean Fishery Management Council
DNER	Department of Natural and Environmental Resources (Puerto Rico)
DPNR	Department of Planning and Natural Resources (United States Virgin Islands)
DPS	distinct population segment
EA	environmental assessment
EEZ	exclusive economic zone
FMP	fishery management plan
MFMT	maximum fishing mortality threshold
MSA	(Magnuson-Stevens Act); Magnuson-Stevens Fishery Conservation and Management Act
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
OFL	overfishing limit
SEDAR	Southeast Data, Assessment, and Review (stock assessment)
SEFSC	Southeast Fisheries Science Center
SSC	Scientific and Statistical Committee
USVI	United States Virgin Islands

Table of Contents

List of Tables

List of Figures

Chapter 1. Introduction

1.1 What Action is Proposed?

Framework Action 3 under the Puerto Rico Fishery Management Plan (FMP): Modification of Status Determination Criteria (SDC) and Management Reference Points for the Triggerfish Stock Complex based on the Southeast Data, Assessment, and Review (SEDAR) 80 Stock Assessment includes an action to update the SDC and other management reference points for species in the Triggerfish stock complex. This action is based on the SEDAR 80 Stock Assessment for the Puerto Rico queen triggerfish (peje puerco, in Spanish) *Balistes vetula*, completed in 2022, hereafter referred to as SEDAR 80. In the Puerto Rico FMP (CFMC 2019), queen triggerfish is managed under the Triggerfish stock complex with ocean (turco, in Spanish) and gray triggerfish (peje puerco blanco, in Spanish) and is the indicator stock (i.e., management measures, SDC, and management reference points are based on landings of queen triggerfish only, but apply to the entire complex).

SDC are the measurable and objective factors, maximum fishing mortality threshold (MFMT), minimum stock size threshold (MSST), and overfishing limit (OFL), or their proxies, which are used to determine if overfishing has occurred, or if the stock or stock complex is overfished. 50 CFR 600.310(e)(2)(i)(A). Under the National Standard 1 guidelines, SDC, maximum sustainable yield (MSY), optimum yield (OY), acceptable biological catch (ABC), and annual catch limit (ACL) are collectively referred to as "reference points," 50 CFR 600.310(b)(2)(iv). The SDC and other reference points are collectively referred to as management reference points throughout this document.

Under this Framework Action, the management reference points to be updated for the Triggerfish stock complex are the MFMT, MSST, OFL, MSY or MSY proxy, ABC, OY, and ACL.

Status Determination Criteria Definitions

Maximum Fishing Mortality Threshold (MFMT) – Level of fishing mortality (F), on an annual basis, above which overfishing is occurring. The MFMT or reasonable proxy may be expressed either as a single number (a fishing mortality rate or F value), or as a function of spawning biomass or other measure of reproductive potential.

Minimum Stock Size Threshold (MSST) – Biomass level below which the capacity of the stock to produce MSY on a continuing basis has been jeopardized. A stock or stock complex is considered overfished when its biomass has declined below MSST.

Overfishing Limit (OFL) – Annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish.

Overfishing occurs whenever a stock or stock complex is subjected to a level of fishing mortality or total catch that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis.

Overfished – A stock or stock complex is considered overfished when its biomass has declined below the MSST.

Management Reference Points Definitions

Maximum Sustainable Yield (MSY) – The largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological, environmental conditions and fishing technology characteristics (e.g., gear characteristics) and the distribution of catch among fleets.

Acceptable Biological Catch (ABC) – The catch level recommended by the Scientific and Statistical Committee and set at or below OFL to account for scientific uncertainty.

Annual Catch Limit (ACL) – The limit of total annual catch for a stock or stock complex that serves as the basis for invoking accountability measures. The ACL cannot exceed the ABC.

Optimum Yield (OY) – The amount of fish that provides the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems.

1.2 Why is the Council Considering Action?

The Puerto Rico FMP, adopted by the Caribbean Fishery Management Council (Council) in 2020 and implemented by National Marine Fisheries Service (NMFS) in 2022, specified a sustainable yield level (SYL)[1] and ABC for the Triggerfish stock complex and set commercial and recreational ACLs (see Appendix G in the Puerto Rico FMP for a description of the process and Section 1.2.2 in this document for specific information about the ABC Control Rule applicable to the Triggerfish stock complex). Additionally, the Puerto Rico FMP specified accountability measures (AM) for each sector and for instances when data for one sector is not available (see Appendix A for a description of the AMs applicable to reef fish stocks).

Through this Framework Action, the Council would update management reference points for the Triggerfish stock complex by incorporating information from SEDAR 80, which was completed in 2022, and is considered the best available scientific information for the stock. Following SEDAR 80, the Triggerfish stock complex in the Puerto Rico FMP would change from Tier 4a (data limited, no accepted assessment available) to Tier 3 (data limited, accepted assessment available) in the Council's ABC Control Rule, as discussed in Sections 1.2.2 and 2.1 of this document.

1.2.1 Stock Assessment Outcomes and Acceptable Biological Catch Rule

Results from SEDAR 80 (SEDAR 80 2022, Table 14) indicate that the queen triggerfish stock in Puerto Rico is not undergoing overfishing based on fishing rates. Additionally, the stock is not in an overfished state as indicated by the biomass of the population.

[1] The SYL is intended to be used when the information or resources needed to produce a quantitative stock assessment are not available to determine the MSY or corresponding reference point such as the OFL.

The Council's Scientific and Statistical Committee (SSC) reviewed results from SEDAR 80 at its November and December 2022 meetings and supported the stock assessment as providing the best scientific information available and determined that the stock assessment was suitable for short-term (i.e.<5 years) management advice.

Acceptable Biological Catch Control Rule

The ABC is a level of annual catch recommended by the Council's SSC, which accounts for the scientific uncertainty in the estimate of the OFL, any other scientific uncertainty, and the Council's risk policy (50 CFR 600.310(f)(1)(ii)). The Council's risk policy (P*) could be based on an acceptable probability (at least 50%) that catch equal to the stock's ABC will not result in overfishing. The Council's choice of a risk policy cannot result in an ABC that exceeds the OFL (50 CFR 600.310(f)(2)(i)). The Council and its SSC follow a process by which the SSC can access the best scientific information available when implementing the ABC Control Rule (i.e., specifying the ABC) (50 CFR 600.310(f)(3). The SSC must recommend the ABC to the Council.

Each of the Puerto Rico, St. Croix, and St. Thomas and St. John FMPs adopt and apply a four-tiered ABC Control Rule to specify SDC (i.e., MFMT, MSST, and OFL or OFL proxy) and other reference points (i.e., MSY or MSY proxy and ABC), depending on differing levels of data availability (see Table 5.13.1 in the Puerto Rico FMP). In the Puerto Rico FMP, the Triggerfish stock complex was considered a Tier 4a stock (data limited with no accepted assessment, with relatively low vulnerability to fishing pressure) and the MSY proxy, MFMT, and MSST were defined, but due to data limitations, were not quantified. Similarly, under Tier 4a, the OFL could not be quantified and a new reference point, the SYL, which is a level of landings that can be sustained over the long-term, was quantified and used as the OFL proxy and an additional MSY proxy. For the Triggerfish stock complex, the SSC recommended an ABC derived from the SYL (see note below*), and the Council set the Triggerfish stock complex ACL for each of the commercial and recreational sector at 95% of the ABC (Table 1.1).

Table 1.1. Triggerfish stock complex (Queen triggerfish = indicator stock) SYLs, ABCs, and ACLs under the Puerto Rico FMP. Values are in pounds whole weight.

Category	SYL	ABC	ACL
Stock complex level (total)	190,636	95,318	90,552
Commercial sector	174,949	87,473	83,099
Recreational sector	15,690	7,845	7,453

*Note that the commercial and recreational SYL and ABC values were calculated independently from each other under Tier 4 of the ABC Control Rule (during the SSC process), and then added together during the FMP process since it was not possible to estimate sector-specific SYLs and

ABCs. The commercial SYL and the commercial ABC equaled 91.77% of the total SYL and total ABC, respectively, while the recreational SYL and ABC equaled 8.23% of the total SYL and ABC, respectively.

Changes to the Tier Level in the ABC Control Rule

The SSC in consultation with NMFS' Southeast Fisheries Science Center (SEFSC) supported that queen triggerfish (i.e., Triggerfish stock complex) be reclassified from a Tier 4a stock complex (data limited with no accepted assessment with relatively low vulnerability to fishing pressure) to a Tier 3 stock complex (data limited, accepted assessment available) under the ABC Control Rule for the Puerto Rico FMP. Under Tier 3 of the ABC Control Rule, if the biomass of the stock falls below MSST, the stock would be determined to be overfished and the Council would then need to develop a rebuilding plan capable of returning the stock to a level that allows the stock to achieve MSY on a continuing basis. Additionally, under Tier 3, in years when there is a stock assessment, if fishing mortality exceeds the MFMT, the stock would be considered to be undergoing overfishing, because this level of fishing mortality, if continued, would reduce the stock biomass to an overfished condition. In years in which there is no assessment, overfishing would occur if landings exceed the OFL.[2]

The SSC coordinated with the SEFSC to provide values for OFLs and ABCs for the Triggerfish stock complex, for years 2024 to 2026. At the December 2022 Council meeting, the SSC presented its recommendations (both variable- and constant-catch OFLs and ABCs, with the ABCs across a range of probabilities of overfishing (P*s) to the Council. The Council decided to use a P* value of 0.40 and to use the 3-year average OFL and ABC for years 2024 through 2026 (i.e., constant catch). The Council would then derive the ACL for each sector from the total ABC, reduced by the Council's management uncertainty[3] buffer through this Framework Action.

1.2.2 Statement of Purpose and Need

The purpose of this Framework Action is to update management reference points for the Triggerfish stock complex under the Puerto Rico FMP to account for the SEDAR 80 Puerto Rico Queen Triggerfish Stock Assessment and application of the Council's ABC Control Rule.

The need for this action is to update management measures for the Puerto Rico Triggerfish stock complex based on best scientific information available to prevent overfishing and achieve OY, consistent with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act.

[2] Under Tier 3 of the ABC Control Rule, overfishing would be determined to be occurring if one year of landings exceeds the annual OFL for the stock.

[3] Management uncertainty refers to uncertainty in the ability of managers to constrain catch so the ACL is not exceeded, and the uncertainty in quantifying the true catch amounts (i.e., estimation errors).

1.3 Where Will the Action Have an Effect?

The area affected by this Framework Action includes federal waters around Puerto Rico (i.e., exclusive economic zone [EEZ]), which are managed by the Council under the Puerto Rico FMP (CFMC 2019) (Figure 1.1).

The EEZ around Puerto Rico was discussed in detail in the Puerto Rico FMP, and is incorporated herein by reference. The EEZ around Puerto Rico (Puerto Rico EEZ) ranges from 9-200 nautical miles (17-370 kilometers) from the shore of the Commonwealth of Puerto Rico to the outer boundary of the EEZ.

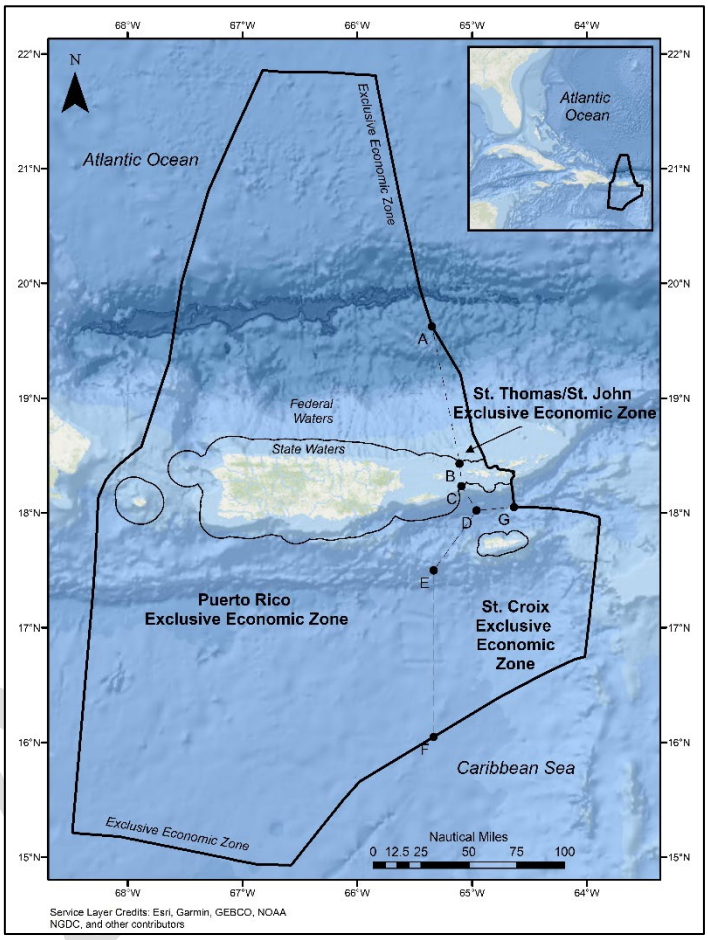

Figure 1.1. U.S. Caribbean region with boundaries between the Puerto Rico, St. Croix, and St. Thomas and St. John management areas.

1.4 History of Federal Fisheries Management

The Puerto Rico FMP established management measures for the EEZ around Puerto Rico including (1) updating the list of species included for federal management and how those species would be grouped into stocks or stock complexes; (2) setting management reference points for managed stocks and stock complexes; (3) updating accountability measures; (4) describing essential fish habitat for managed species; and (4) updating framework procedures. The Puerto Rico FMP retained other management measures established under the U.S. Caribbean-wide FMPs that apply to Puerto Rico (e.g., seasonal and area closures, minimum size limits, recreational bag limits). The Secretary of Commerce approved the Puerto Rico FMP on September 22, 2020. The FMP became effective on October 13, 2022.

Prior to the development of the Puerto Rico FMP, triggerfish species (queen, ocean, and sargassum triggerfish) were managed under the Reef Fish FMP of Puerto Rico and the U.S. Virgin Islands (USVI), as amended. Under the Reef Fish FMP, gray triggerfish was not in the Reef Fish fishery management unit, while sargassum triggerfish was. The history of management actions under the Reef Fish FMP are summarized in Appendix C1 of the Puerto Rico FMP, which are incorporated herein by reference. Below is an annotated list of fishery management actions and amendments that are specifically related to management reference points and AMs for reef fish, including triggerfish species.

Reef Fish FMP (CFMC 1985)
The Reef Fish FMP defined MSY and OY for reef fish species included for management in federal waters around Puerto Rico and the USVI. Under the FMP, MSY values were estimated for the three management areas (Puerto Rico, St. Thomas and St. John, St. Croix) and then summed to provide an estimate for the entire U.S. Caribbean EEZ.

Amendment 2 to the Reef Fish FMP (CFMC 1993)
Amendment 2 expanded the existing fishery management unit in the Reef Fish FMP to include deep-water reef fish to address their decline in landings. The amendment applied existing definitions of MSY and OY to all reef fish within the revised fishery management unit, with the exception of marine aquarium finfish, and established seasonal closures areas off western Puerto Rico.

Amendment 3 to the Reef Fish FMP (2005 Caribbean Sustainable Fisheries Act (SFA) Amendment (CFMC 2005))
Amendment 3 accomplished the following: redefined the fishery management units for the Reef Fish, Spiny Lobster, Queen Conch, and Corals and Reef Associated Invertebrates FMPs; established seasonal closures; imposed gear restrictions and requirements; established biological reference points and stock status criteria; established rebuilding schedules and strategies to end overfishing and rebuild overfished stocks. The amendment established rebuilding plans for overfished units: grouper unit (GU)1, GU2, GU4, and queen conch; designated essential fish habitat (EFH) and habitat areas of particular concern and minimized adverse impacts on such habitat to the extent practicable.

Amendment 6 to the Reef Fish FMP (CFMC 2011)
Amendment 6 established ACLs and AMs for all reef fish species in the Reef Fish FMP that were not determined to be undergoing overfishing at the time (including triggerfish); allocated ACLs among management areas; established recreational bag limits for reef fish; revised management reference points and SDC for selected reef fish and aquarium trade reef fish species.

Amendment 7 to the Reef Fish FMP (CFMC 2016)
Amendment 7 revised language in the Reef Fish FMP to be consistent with language in the implementing regulations at 50 CFR Part 622 describing the application of AMs in the U.S. Caribbean EEZ.

Amendment 8 to the Reef Fish FMP (CFMC 2017a)
Amendment 8 changed the implementation date for AM-based closures for all stocks in the Reef Fish FMP from December 31st to September 30th and required that the Council revisit the use of September 30th as the end date for AM-based closures no longer than two years from implementation of the amendment and no longer than every two years thereafter.

Regulatory Amendment 6 to the Reef Fish FMP (CFMC 2017b)
Regulatory Amendment 6 revised the method used to trigger the application of AMs for Council managed-reef fish species/species groups in the Puerto Rico EEZ.

Puerto Rico FMP (CFMC 2019)
The FMP included a new four-tiered ABC Control Rule to define management reference points for reef fish species, including the Triggerfish stock complex (queen, ocean and gray triggerfish) and updated the AM for Reef Fish.

Chapter 2. Proposed Action and Alternatives

Framework procedures included in the Puerto Rico Fishery Management Plan (FMP) allow the Caribbean Fishery Management Council (Council) to modify management measures in certain situations, including when a new stock assessment indicates changes should be made to reference points.

2.1 Action: Update Reference Points for the Triggerfish Stock Complex under the Puerto Rico FMP

This Framework Action under the Puerto Rico FMP would update the maximum sustainable yield (MSY) or MSY proxy, maximum fishing mortality threshold (MFMT), and minimum stock size threshold (MSST) for the Triggerfish stock complex (Table 2.1.1). Additionally, the Framework Action would update the overfishing limit (OFL) and the acceptable biological catch (ABC) for the Triggerfish stock complex equal to the three-year average from the projected 2024-2026 values (Table 2.1.2). For the Triggerfish stock complex, the OFL would be 118,283 pounds (lbs) whole weight (ww) and the ABC would be 91,810 lbs ww.

Table 2.1.1. Reference points from SEDAR 80 Queen Triggerfish stock assessment for Puerto Rico.

Reference Point	Value
MSY proxy	SPR 30%
MFMT	$F_{SPR\ 30\%} = 0.215$
MSST	$0.75 * SSB_{MSY}$[1]

[1] SSB_{MSY} is the long term SSB produced when fishing at F_{MSY} or its proxy or its proxy (in this case FSPR 30%)

Table 2.1.2. OFL and ABC (in pounds whole weight) values for the Triggerfish stock complex for fishing years 2024-2026 and for the 3-year average.

Year	OFL (stock)	ABC (stock)
2024	124,540	96,670
2025	117,500	91,200
2026	112,810	87,560
Average	**118,283**	**91,810**

Source: December 2022 Council meeting

Lastly, in this Framework Action, the Council would select its level of management uncertainty to derive the annual catch limits (ACL) for the commercial and recreational fishing sectors from the ABC. The ACLs would be set equal to optimum yield (OY) for the stock complex.

2.1.1 Proposed Alternatives

Alternative 1. No Action. Reference points for the Triggerfish stock complex would remain as specified under the Puerto Rico FMP.

Alternative 2. Update reference points for the Triggerfish stock complex based on SEDAR 80 and set the total ACL (which equals OY) **equal to** the ABC recommended by the Council's Scientific and Statistical Committee (SSC).

Alternative 3 (Preliminary Preferred). Update reference points for the Triggerfish stock complex based on SEDAR 80 and set the total ACL (which equals OY) **equal to 95%** of the ABC recommended by the Council's SSC.

Alternative 4. Update reference points for the Triggerfish stock complex based on SEDAR 80 and set the total ACL (which equals OY) **equal to 90%** of the ABC recommended by the Council's SSC.

Table 2.1.3. Proposed ACLs as reduced from the stock ABC by the Council's management uncertainty buffer for Alternatives 1-4.

Alternative	ABC	Total ACL	Commercial ACL[1]	Difference from status quo	Recreational ACL[2]	Difference from status quo
Alt. 1	95,318	90,552	83,099	--	7,453	--
Alt. 2 (0% reduction)	91,810	91,810	84,254	1,155	7,556	103
Alt. 3 (5% reduction)		87,220	80,041	-3,058	7,178	-275
Alt. 4 (10% reduction)		82,629	75,829	-7,270	6,800	-653

[1] Commercial ACL is 91.77% of the total ACL

[2] Recreational ACL is 8.23% of the total ACL

2.1.2 Discussion of Alternatives

Alternative 1 would not update the Triggerfish stock complex reference points following the SSC-accepted SEDAR 80 stock assessment, and thus would not be based on the best scientific information available. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) National Standard (NS) 2 Guidelines state that "conservation and management measures shall be based upon the best scientific information available" (50 CFR 600.315(a)). Therefore, **Alternative 1** would be inconsistent with the requirements of the Magnuson-Stevens Act and NS2 Guidelines.

Alternative 2, **Alternative 3 (Preliminary Preferred)**, and **Alternative 4** would update the MFMT, MSY proxy, and MSST and set the OFLs and ABCs, for the Triggerfish stock complex using the best scientific information available (i.e., SEDAR 80, Tier 3 of the ABC Control Rule, and SSC recommendations accepted by the Council) and would set ACL values based on varying degrees of management uncertainty. Applying the best scientific information available would ensure that federally managed stocks are harvested sustainably while protecting reproductive capacity and maintaining effective ecological contributions.

Alternative 2, Alternative 3 (Preliminary Preferred), and **Alternative 4** have a smaller buffer between the OFL and the ABC when compared to the buffer between the OFL proxy (Sustainable Yield Level [SYL]) and ABC under **Alternative 1**. In general, a smaller buffer would increase the likelihood that OFL could be exceeded if catch rates or effort is higher than expected. If the OFL is exceeded, this would indicate that the stock is experiencing overfishing and would require immediate action to end overfishing. However, the SYL under **Alternative 1** does not reflect the best scientific information available for the Triggerfish stock complex.

The total ACL under **Alternative 1**, which was established in the Puerto Rico FMP, is equal to 95% of the ABC recommended by the SSC in the FMP and is lower than the total ACL proposed in **Alternative 2**, but higher than the total ACLs proposed in **Alternatives 3** (**Preliminary Preferred**) and **Alternative 4**. Under the status quo, ACLs for the commercial and recreational sectors were equal to 91.77% and 8.23% of the total ACL, respectively, and these percentages will remain the same for all alternatives (i.e., this action does not alter the sector allocations). Recreational landings are not currently being collected or monitored, thus at this time it is not possible to re-estimate (or re-establish) commercial and recreational allocations from the total ABC.[4] Similar to the reference points from which the ACLs are derived, the commercial and recreational ACLs under **Alternative 1** do not represent the best scientific information available.

The range of reduction buffers proposed in **Alternatives 2-4** account for the Council's level of management uncertainty for the Triggerfish stock complex. **Alternative 2** (no reduction) would set the total ACL equal to the ABC, resulting in the greatest harvest allowed when compared to **Alternative 3 ((Preliminary Preferred)** and **Alternative 4** (Table 2.1.3). The 10% buffer applied in **Alternative 4** would be more conservative than the 5% reduction buffer in **Alternative 3** and would allow for the least amount of harvest of the action alternatives.

Under all alternatives, if landings exceeds the ACL, accountability measure (AM)-based closures could be required in subsequent fishing years to prevent repeated ACL overages to protect against future overfishing (see Table 2.1.4). In Puerto Rico, the most recent and complete annual commercial landings (i.e., landings adjusted using coast-specific expansion factors) for the

[4] The lack of recreational landings information that could be used to revisit the sector percentages (allocations) highlights a data need for the stocks and stock complexes managed under the Puerto Rico FMP.

Triggerfish stock complex (56,867 lbs ww in 2019, Table 3.3.3) are less than the proposed commercial ACLs under each of **Alternative 2**, **Alternative 3 (Preliminary Preferred)**, and **Alternative 4**, as well as under the commercial ACL under **Alternative 1** (83,099 lbs ww). If future commercial landings for the Triggerfish stock complex are at the 2019 level, AMs would not be expected to be triggered under any of the alternatives and there would be no need to apply AM-based fishing season closures.

With respect to the recreational sector, the most recent complete landings available are from 2016 (8,072 lbs ww, Table 3.3.4), which is slightly greater than the ACLs under each of **Alternative 1, Alternative 2**, **Alternative 3 (Preliminary Preferred)**, and **Alternative 4**. If future recreational landings are at the 2016 levels, AMs may be triggered. However, because recreational landings information is not available to monitor the recreational ACL, the commercial ACL applies to all harvest. Therefore, as discussed in the previous paragraph, AMs are not expected to be triggered for the Triggerfish stock complex under any of the alternatives considered.

Table 2.1.4. Example of the process used to monitor ACLs (lbs ww) established in the Puerto Rico FMP for the Triggerfish stock complex for years 2024-2026. Note that the ACL used in this example is the value under Alternative 1 (status quo).

Calendar Year	Most Recent Landings Available*	Triggerfish ACL in Place in Year of Most Recent Landings	Years used in ACL Monitoring (per FMP)	Landings used in ACL monitoring	ACLs compared to Landings	If AM applied, ACL compared to average landings
2024	2022	83,099	2-year average	Average 2021-2022	Average ACLs from 2021-2022	2024 ACL (TBD)
2025	2023	83,099	3-year average	Average 2021-2023	Average ACLs from 2021-2023	2025 ACL (TBD)
2026	2024**	TBD	3-year average	Average 2022-2024	Average ACLs from 2022-2024	2026 ACL (TBD)

*Assuming a 2-year delay in availability in the commercial landings, which was typical before electronic reporting delays.

**Assuming new ACLs for the Triggerfish stock complex are in place in 2024.

Chapter 3. Affected Environment

This section describes the environment and resources included within federal waters off Puerto Rico that would be affected by the proposed action. Additional information on the physical, habitat, biological/ecological, economic, social, and administrative environments of Puerto Rico has been described in detail in the Puerto Rico Fishery Management Plan (FMP) (CFMC 2019), and is incorporated by reference and summarized below.

3.1 Description of the Physical Environment

The U.S. Caribbean Exclusive Economic Zone (EEZ) covers approximately 75,687 mi^2 (196,029 km^2), which, for management purposes, is divided into the Puerto Rico, St. Croix, and St. Thomas/St. John management areas (see Figure 1.1). This action applies only to the EEZ around Puerto Rico.

3.1.1 Puerto Rico

The Puerto Rico EEZ (i.e., federal waters) is located 9 - 200 nautical miles (17 - 370 km) from the shoreline and covers approximately 65,368 mi^2 (169,303 km^2). Puerto Rico includes the adjacent inhabited islands of Vieques and Culebra as well as various other isolated islands without permanent populations including Mona, Monito, and Desecheo. Puerto Rico is surrounded on three sides by deep ocean waters: the Mona Passage to the west (> 3,300 ft [1,000 m] deep); the Puerto Rico Trench to the north (~28,000 ft [8,500 m] deep); and the Venezuelan Basin of the Caribbean Sea to the south (~16,400 ft [5,000 m] deep). To the east, Puerto Rico shares the shallow-water shelf platform with St. Thomas/St. John, U.S. Virgin Islands (USVI).

3.1.2 Habitat Environment and Essential Fish Habitat

The coastal marine environments of Puerto Rico and the USVI are characterized by a wide variety of habitat types, with 21 distinct benthic habitats types delineated. The Essential Fish Habitat Final Environmental Impact Statement (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. 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 shoreline to about 66 feet (ft) (20 meters [m]) depth. Appendix J in the Puerto Rico FMP describes the preferred habitats for all species managed in federal waters.

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)). EFH information for

Reef Fish species affected by this amendment is described in the Puerto Rico FMP and in Amendment 1 to the Puerto Rico FMP (Buoy Gear Amendment) (CFMC 2022) and is incorporated herein by reference and summarized below.

Reef Fish EFH in the Puerto Rico FMP:
EFH for Reef Fish (including species in the Triggerfish stock complex) consists of all waters from mean high water to the outer boundary of the U.S. Caribbean EEZ (habitats used by eggs and larvae) and all substrates from mean high water to 100 fathoms depth (habitats used by other life stages). For gray triggerfish, the eggs are not associated with the water column, and this area is not EFH for the eggs.

3.2 Description of the Biological and Ecological Environments

The Puerto Rico FMP (CFMC 2019) includes a description of the biological and ecological environments for the species managed in federal waters around Puerto Rico, including triggerfish species, which is incorporated herein by reference and summarized below.

3.2.1 Description of the Species

The species directly affected by this action are the queen triggerfish *Balistes vetula*, ocean triggerfish *Canthidermis sufflamen*, and gray triggerfish *Balistes capriscus*. These species are managed together under the Triggerfish stock complex in the Puerto Rico FMP. The queen triggerfish is the indicator species for the stock complex. Triggerfish are a popular target of commercial, recreational, and subsistence fishing in Puerto Rico.

Appendix J of the Puerto Rico FMP contains a description of the life history, distribution and habitat, diet, reproduction and spawning characteristics of each of these species and that information is incorporated herein by reference. Information for the indicator species for the stock complex, the queen triggerfish, is summarized below.

3.2.1.1 Life history

Distribution
Queen triggerfish are widely distributed in tropical and sub-tropical waters of the western Atlantic, from the coast of North Carolina, throughout the Caribbean Sea, and as far south as Atlantic waters of southern Brazil. Queen triggerfish are generally found over rocky or coral areas, from depths of 2-275 m. It also has been observed over sand and grassy areas (CFMC 2019). These reef-associated species are known to exhibit high levels of fidelity to specific areas (Bryant et al. 2019). There is high connectivity across the region with no isolation detected for fish sampled from waters throughout the U.S. Caribbean or beyond (Antoni 2017 in SEDAR 80 2022).

Reproduction

The queen triggerfish is a sexually dimorphic species (i.e., two sexes of the species are different). Rivera-Hernadez et al. (2018) identified the smallest sexually mature male and female in Puerto Rico as having 184 and 215 mm fork length (FL), respectively, and the lengths at 50% sexual maturity (L_{50}) for males sampled from Puerto Rico at 206 mm FL, which were significantly smaller than the L_{50} for females in Puerto Rico (256 mm FL).

The queen triggerfish is a nesting benthic spawner (i.e., deposit their eggs on the bottom of the sea). Rivera-Hernandez et al. (2018) indicates that in the U.S. Caribbean, the spawning season can start as early as the week after the full moon in December and extend until August. The number of days between spawning events for a female (spawning interval) was 54–55 days, indicating that a female could spawn up to five times over the estimated 241–267 days spawning season.

3.2.1.3 Status of the Stock

Previous stock assessments for U.S. Caribbean queen triggerfish have attempted to quantify stock status and condition using traditional stock assessment procedures. For the Puerto Rico queen triggerfish, SEDAR 30 (2013) was the most recent assessment (e.g., mean-length) prior to SEDAR 80. Those previous assessments resulted in unsatisfactory determination of stock status due to the lack of sufficient data with which to parameterize the models.

SEDAR 80 used of a statistical catch at age model in the context of a data-limited modeling framework to provide management advice for U.S. Caribbean resources. The intent was to evaluate new information for the queen triggerfish resources not available at the time of 2013 SEDAR 30 and the 2016 SEDAR 46 Caribbean Data-Limited Species assessments in an integrated analytical framework using the Stock Synthesis (SS) model using data through 2019 for Puerto Rico (SEDAR 80 2022).

Outcomes from SEDAR 80 indicate that from 1983 – 2019 (time horizon of the assessment), the queen triggerfish stock experienced overfishing during all years between 1983 and 2005 and again in 2008, but has not experienced overfishing since 2008. Of note is that annual exploitation increased to a state of near overfishing in 2019. Additionally, the stock was overfished between 1984 and 2000 and again in 2004 and 2005. Based on the management thresholds (i.e., minimum stock size threshold and maximum fishing mortality threshold) from SEDAR 80, the queen triggerfish stock (and thus the Triggerfish stock complex) in Puerto Rico was not considered overfished and was not undergoing overfishing. However, it is noted in SEDAR 80 that the stock biomass has declined substantially over the last six years, likely due in large part to low recruitment estimated by the model during 2013-2019.

3.2.1.4 Responses to Climate Change

Climate-related impacts observed in the Southeast region include species distribution shifts, coral bleaching and disease, extreme precipitation events leading to freshwater diversions and marine mammal mortality, changes in tropical cyclone dynamics, and more intense harmful algal blooms, among others (NMFS Southeast Regional Action Plan, May 2023).

Key climate drivers expected to impact marine resources in the Caribbean region include increasing sea surface temperatures, increasing ocean acidification, sea level rise, and increasing frequency and severity of tropical storms and hurricanes. Climate change projections predict increases in sea-surface temperature and sea level; decreases in sea-ice cover; and changes in salinity, wave climate, and ocean circulation (IPCC). Climate change can affect reef fish populations as the coral reef ecosystems in which they reside shift due to increases in water temperatures, extreme weather events (e.g., hurricanes) and shifts in ocean currents. These climate change-related shifts can also affect the food chain that reef fish and pelagic species rely on (for additional information, see https://www.fisheries.noaa.gov/insight/understanding-our-changing-climate). For reef fishes, Burton (2008) and Morley et al. (2018) speculated climate change could cause shifts in spawning seasons, changes in migration patterns, and changes to basic life history parameters such as growth rates. Changes specific to spawning could be related to changes in temperature, for example, by causing changes to the reproduction and recruitment of spawners during those months, or causing changes to the length of larval periods. In the U.S. Caribbean, for reef fish species such as the triggerfish species, climate change related shifts in species distribution may be related to depth distribution changes, with species moving to deeper cooler waters in response to warming sea temperatures (CFMC Scientific and Statistical Committee [SSC] Meeting, Nov/Dec 2022). Fishery management councils have and will continue to have to deal with (as impacts become larger in the near future) challenges associated with shifting baselines and respond to the effects of those shifts on managed fish populations (CFMC SSC Meeting, Nov/Dec 2022).

The Caribbean Fishery Management Council (Council) in partnership with National Marine Fisheries Service's (NMFS) Southeast Regional Office is developing a Fishery Ecosystem Plan (FEP) that would evaluate how best to integrate ecosystem approaches into existing fisheries management in the U.S. Caribbean. The data collection process in the FEP includes the acquisition of datasets that can provide information on changes through time, that may allow identifying and responding to climate variability and climate change impacts on Caribbean marine ecosystems/fisheries (NMFS Southeast Regional Action Plan, May 2023).

Integrating the potential effects of climate change into the fisheries assessment process is currently difficult due to the assessment rarely projecting through a time span that would include detectable climate change effects (Hollowed et al. 2013 in GMFMC 2021). Ecosystem models are being developed that incorporate future, potential, climate change effects (Chagaris et al.

2019; Gruss et al. 2017; King and McFarlane 2006; Pinsky and Mantua 2014 in GMFMC 2021). These complex factors do not change the reality of climate change impacts on managed species and the need to incorporate this information into stock assessments. Better planning and collaboration with managers is currently being pursued to include this type of data into the assessment process (GMFMC 2021).

3.2.2 Bycatch

The Puerto Rico FMP includes a bycatch practicability analysis for its managed species, which is incorporated herein by reference, and summarized below.

The reef fish component of the Puerto Rico fisheries is multi-species. In Puerto Rico, reef fish are mainly harvested commercially in federal waters using hook and line gear, although pots/traps and diving with spears are also used. Most of the fishing for reef fish occurs in territorial waters of Puerto Rico with hook and line, traps pots and spears, while some harvest are reported with nets such as gillnets and trammel nets. Recreational harvest of reef fish in federal waters is thought to mostly be conducted with hook and line, though recent recreational data are not available at this time. Triggerfish species are mainly caught commercially by spearfishing and with traps/pots in Puerto Rico. Queen triggerfish is not a directly targeted species and it is possible that most of the triggerfish caught in traps are retained, although some fish that are too big or too small are returned to the water. In addition, queen triggerfish is known to be a hardy species and less sensitive to barotrauma effects than other reef fishes. Testimony from fishers at Council meetings note that discard mortality for those individuals returned to the water seems to be low. Additional information about queen triggerfish discards and discard mortality is available in SEDAR 80 (2022). The Council recently approved the requirement to have available descending devices when fishing for reef fish and once implemented, this is expected to reduce mortality of bycatch reef fish species, such as the triggerfish. In general, bycatch is not as significant an issue in Puerto Rico as compared to other regions. What little bycatch that does occur is generally confined to regulatory discards (CFMC 2019).

This action is not expected to significantly increase or decrease the magnitude of bycatch or bycatch mortality in the Puerto Rico fisheries that targets reef fish. Additionally, since fishermen in the U.S. Caribbean region traditionally utilize most resources harvested, and the amount of bycatch from the fisheries targeting reef fish is minimal and is not expected to change under this action; little to no affect to mammals or birds would be expected.

3.2.3 Protected Species

Within the U.S. Caribbean, some species and their habitats are protected under the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), or both. A brief

summary of these two laws and more information is available on the NMFS Office of Protected Resources website.[5]

NMFS completed a Biological Opinion on September 21, 2020, evaluating the impacts of the Puerto Rico, St. Croix, and St. Thomas/St. John fisheries on ESA-listed species and designated critical habitat that occur in the U.S. Caribbean region (NMFS 2020; Table 3.2.1). In the Biological Opinion, NMFS determined that the authorization of the fisheries conducted under each FMP is not likely to adversely affect sperm, sei, and fin whales; the Northwest Atlantic distinct population segments (DPS) of loggerhead sea turtle and leatherback sea turtle; giant manta rays; or critical habitat of green, hawksbill, or leatherback sea turtles. The Biological Opinion also determined that the authorization of the island-based fisheries is not likely to jeopardize the continued existence of the North Atlantic DPS of green sea turtle, South Atlantic DPS of green sea turtle, hawksbill sea turtle, Nassau grouper, oceanic whitetip shark, Central and Southwest Atlantic DPS of scalloped hammerhead shark, elkhorn coral, staghorn coral, rough cactus coral, pillar coral, lobed star coral, mountainous star coral, or boulder star coral, or result in the destruction or adverse modification of designated *Acropora* critical habitat.

Table 3.2.1. ESA-listed species that may occur in the U.S. Caribbean region.

Common Name	Species Name	Status	Determination
Sei whale	*Balaenoptera borealis*	Endangered	NLAA
Sperm whale	*Physeter macrocephalus*	Endangered	NLAA
Fin whale	*Balaenoptera physalus*	Endangered	NLAA
Green sea turtle North Atlantic DPS	*Chelonia mydas*	Threatened	NLJ
Green sea turtle South Atlantic DPS	*Chelonia mydas*	Threatened	NLJ
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	NLJ
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	NLAA
Loggerhead sea turtle Northwest Atlantic DPS	*Caretta caretta*	Threatened	NLAA
Elkhorn coral	*Acropora palmata*	Threatened	NLJ
Staghorn coral	*Acropora cervicornis*	Threatened	NLJ
Rough cactus coral	*Mycetophyllia ferox*	Threatened	NLJ
Pillar coral	*Dendrogyra cylindrus*	Threatened	NLJ
Lobed star coral	*Orbicella annularis*	Threatened	NLJ
Mountainous star coral	*Orbicella faveolata*	Threatened	NLJ
Boulder star coral	*Orbicella franksi*	Threatened	NLJ
Scalloped hammerhead shark (Central and Southwest Atlantic DPS)	*Sphyrna lewini*	Threatened	NLJ
Nassau grouper	*Epinephelus striatus*	Threatened	NLJ
Oceanic whitetip shark	*Carcharhinus longimanus*	Threatened	NLJ
Giant manta ray	*Manta birostris*	Threatened	NLAA

[5] https://www.fisheries.noaa.gov/protecting-marine-life

Common Name	Species Name	Status	Determination
Queen conch	*Aliger gigas*	Threatened	*

NLAA = not likely to adversely affect

NLJ = not likely to jeopardize the continued existence

* The Southeast Regional Office's Protected Resource Division is drafting an amended biological opinion to address the newly-listed queen conch and coral and Nassau grouper critical habitats.

ESA designated critical habitat for the green sea turtle, hawksbill sea turtle, leatherback sea turtle, and *Acropora* corals also occur within the Council's jurisdiction. Critical habitat for green and hawksbill sea turtles occurs entirely within Puerto Rico state waters. Designated critical habitat of *Acropora* corals in Puerto Rico extend from the mean low water line seaward to the 98 foot (30 meter) depth contour (73 FR 72209), the majority of which occur in state waters.

The action contained in this amendment is not anticipated to modify the operation of Puerto Rico fishery in a manner that would cause effects to ESA-listed species or critical habitat that were not considered in the 2020 Biological Opinion.

On August 9, 2023, NMFS published a final rule designating critical habitat for five threatened Caribbean coral species, *Orbicella annularis, O. faveolata, O. franksi, Dendrogyra cylindrus,* and *Mycetophyllia ferox* (88 FR 54026). A final rule to designate critical habitat for the threatened Nassau grouper published on published on January 2, 2024 (89 FR 126), and on February 14, 2024, NMFS published a final rule to list the Queen Conch as threatened under the ESA (89 FR 11208). Additionally, a proposed rule to designate critical habitat for six DPSs of the green sea turtle published on July 19, 2023 (88 FR 46572). Section 7 conference and consultation plans were developed for these rules to ensure NMFS' ESA Section 7 responsibilities are addressed with respect to existing FMPs and their implementing regulations if these listings and designations are finalized.

Information on the MMPA and the ESA is available on the NMFS Office of Protected Resources website.[6]

3.3 Description of the Puerto Rico Fishery Targeting Species in the Triggerfish Stock Complex

The Puerto Rico FMP (CFMC 2019) contains a comprehensive description of the fisheries and sectors occurring within its EEZ and that information is incorporated herein by reference. Information from the original Reef Fish FMP and Amendment 1 to the Puerto Rico FMP (i.e.,

[6] https://www.fisheries.noaa.gov/protecting-marine-life

Buoy Gear Amendment) (CFMC 2022) were also used to draft the following sections, which describe the fisheries affected by this action.

The fisheries of the U.S. Caribbean region provide food, livelihoods, and income to residents. The region's fisheries (federal and state[7]) can be divided into commercial, recreational, and subsistence sectors. Commercial fishermen pursue multiple species using multiple gear types and are characterized as "artisanal" because their fishing vessels tend to be less than 45 ft (13.7 m) long, have small crews, yield small revenues (when compared to revenues from commercial fishing in the continental U.S.), and their seafood processors are small-scale producers.

In the Puerto Rico FMP, fishable habitat was defined as those waters less than or equal to 100 fathoms (fms) (600 ft; 183 m). 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 fms (600 ft; 183 m) (CFMC 2005).

The total area of fishable habitat (less or equal to 100 fms) in the U.S. Caribbean is estimated to be approximately 2,214.1 square nautical miles (nm^2) (7,594 km^2). The fishable habitat within the EEZ is 304.7 nm^2 (1,045 km^2) or 13.7% of the U.S. Caribbean total, with 119.5 nm^2 (410 km^2) occurring in the EEZ off Puerto Rico and 185 nm^2 (635 km^2) occurring in the EEZ off the USVI. The vast majority of the fishable habitat in federal waters off Puerto Rico is located off the west coast.

3.3.1. Triggerfish Stock Complex Management and Landings

Reef fish stocks in Puerto Rico federal waters are managed under the Puerto Rico FMP with (1) annual catch limits (ACL) for each of the commercial and recreational sectors, (2) accountability measures (AM) to prevent exceedances of the ACLs, (3) an aggregate bag limit for recreational harvest of reef fish, (4) seasonal closure for certain reef fish species , and (5) area closures that protect spawning populations for some of the reef fish species and the habitat that support those aggregations.

The Puerto Rico Triggerfish stock complex is composed of the queen triggerfish (*peje puerco*), the ocean triggerfish (*turco*), and the gray triggerfish (*peje puerco blanco*), the latter of which is a species newly added for management. The queen triggerfish is not a primary target species, and it is fished opportunistically (e.g., spearfished when encountered). During the development of the Puerto Rico FMP, the Council's Scientific and Statistical Committee (SSC) recommended managing ocean and gray triggerfish together in a single complex with queen triggerfish because of the limited information available for ocean and gray triggerfish. All three stocks ranked as

[7] State means each of the several states, the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, the Virgin Islands, Guam, the Northern Mariana Islands, and any other Commonwealth, territory, or possession of the United States (50 CFR 600.10).

being moderately productive, but whereas the ocean and gray triggerfish were scored as low with respect to fishery susceptibility, the queen triggerfish was scored as low/moderate. In addition, queen triggerfish is the only triggerfish species that appears in the catch report forms. Thus, the best scientific information available upon which to manage the complex comes from the queen triggerfish, making queen triggerfish an appropriate indicator species for the stock complex. These recommendations were also supported by the Puerto Rico District Advisory Panel.

Recreational bag limits for reef fish that apply to the Triggerfish stock complex are: 5 fish per person/day, of which no more than 1 may be surgeonfish, or, if 3 or more persons are aboard, 15 fish total per vessel/day, of which no more than 4 may be surgeonfish.

3.3.1.1 Annual Catch Limits and Accountability Measures

Currently, the commercial ACL for the Triggerfish stock complex is 83,099 lbs (37,693 kg) and the recreational ACL is 7,453 lbs (3,380.6 kg). While fishery resources within 9 nm (17 km) of the Puerto Rico coast are managed by the Commonwealth of Puerto Rico, commercial landings from the EEZ and territorial waters are combined and compared to the commercial ACL. The queen triggerfish is the indicator stock.

For stock complexes with an indicator stock selected, such as for the Triggerfish stock complex, landings of the indicator stock will be compared to the ACL and any required AM would be applied to all stocks within the stock complex. The most recent landings used to determine if AMs need to be triggered was 2019. Because recreational landings are not available, commercial ACLs are applicable for all harvest. During the most recent monitoring of landings, triggerfish landings were at 68% of the ACL.

For specific information about ACLs and AMs, see Chapter 5 in the Puerto Rico FMP (CFMC 2019), which is incorporated herein by reference.

3.3.1.2 Participants, Gear Types, and Methods Used to Harvest Triggerfish in Puerto Rico

As described in the Puerto Rico FMP, the commercial sector is responsible for the majority of landings. Commercial fishermen target multiple species using multiple gear types during the same fishing trip. Gear types principally used in the commercial fishery are lobster traps, fish traps, gillnets and trammel nets, cast nets, beach seines, spears, hand lines, long lines (both surface and benthic), trolling and hand collection, with many variations in both design and use Valle-Esquivel et al. 2011 in Appeldoorn et al. 2015). Although historically, traps have dominated the catch, their use has declined over time leading to a more balanced fishery using nets, lines, traps, and spears (Appeldoorn et al. 2015). The essential fishing gear has traditionally been fish traps, hand-dragged nets such as *mallorquines,* and the trammel, lines for bottom fishing, and fishing poles. Commercial fishing activities are limited to the insular platform and

to external banks (Valdés-Pizzini 2014). Commercial fishermen fish the Commonwealth waters from shore to 9 nautical miles (nm) and federal waters that extend to 200 nm, with most of their fishing activity remaining closer to the shore. Matos-Caraballo and Agar (2008) found that the continental shelf and shelf break were the preferred fishing grounds.

Spearfishing is the most common gear type/method used to commercially harvest queen triggerfish, closely followed by fish traps, and lastly handlines. Most of the triggerfish landings come from state waters (Table 3.3.1). During 2012-2019, the top gear types reported for commercial landings of queen triggerfish in Puerto Rico were spears (44%), fish traps (41%), and hand line (8%) (Table 3.3.1).

Table 3.3.1. Percentage of commercial landings (by weight) for fishing trips that reported queen triggerfish in Puerto Rico from 2012-2019 by gear type and jurisdiction.

Jurisdiction	Spear	Fish Trap	Handline	Other
State Waters	77	76	72	70
Federal Waters	9	14	8	12
Unknown	14	10	20	17

3.3.1.3 Landings

Landings of reef fish, including triggerfish species, are available from self-reported commercial fishermen logbooks, and include information on fishing gear type and location where the catch was landed. At the time this framework action was prepared, the most recent and complete year of commercial landings available was from 2019, and represents the best scientific information available. Available information from 2020 through 2022 may be mentioned as reference, but this information is considered incomplete and preliminary, therefore it has not been used in the analyses included in this document.

3.3.1.3.1 Commercial Landings

Commercial landings were downloaded from the Southeast Fisheries Reporting System portal on February 22, 2024. Note, commercial landings from years 2020-2023 that are available on the portal are preliminary (i.e., expansion factors have not been applied and e-reported landings are not included), so those years were not included in this section.

From 2012 through 2019, an average of 790 of Puerto Rico's commercial fishermen reported landings for all species combined and an average of 28,386 trips were taken (Table 3.3.2). For queen triggerfish, from 2012 through 2019, an average of 253 commercial fishermen reported queen triggerfish landings on an average of 3,297 trips (Table 3.3.3).

Table 3.3.2. Commercial landings of all species (in adjusted pounds) in Puerto Rico for 2012-2019 with the percent reported from state waters (0-9 nautical miles), federal waters (9-200 nautical miles), or unknown location.

Year	# Fishermen	#Trips	Total Landings	% from State Waters	% from Federal Waters	% from Unknown Waters
2012	749	27,390	2,742,281	22	17	61
2013	798	29,248	1,892,770	62	12	27
2014	854	30,899	2,330,619	65	17	18
2015	830	31,209	2,370,452	66	17	17
2016	811	29,345	2,369,476	79	15	7
2017	760	21,884	1,770,882	84	13	3
2018	720	26,370	2,408,744	84	13	3
2019	800	30,746	2,466,947	77	20	2

Queen triggerfish accounts for the vast majority of the triggerfish landings in Puerto Rico. From 2012 through 2019, the majority of queen triggerfish commercial landings were harvested from territorial waters rather than federal waters (Table 3.3.3).

Table 3.3.3. Commercial landings of queen triggerfish (in adjusted pounds) in Puerto Rico for 2012-2019 with the percent reported from state waters (0-9 nautical miles), federal waters (9-200 nautical miles), or unknown location.

Year	# Fishermen	#Trips	Total Landings	% from State Waters	% from Federal Waters	% from Unknown Waters
2012	219	2,882	76,826	22	19	59
2013	280	3,593	64,112	65	14	20
2014	283	3,806	71,791	72	11	17
2015	288	3,993	71,407	74	13	12
2016	264	3,405	66,160	86	9	5
2017	221	2,133	40,437	89	6	4
2018	217	2,941	57,089	92	5	2
2019	255	3,623	56,867	87	10	3
Average	253	3,297	63,086	73	11	15

3.3.1.3.2 Recreational Harvest

The recreational fishery in Puerto Rico consists of boat-based fishing, shore fishing, charter boat fishing and tournament fishing for highly migratory and coastal pelagic fishes and dolphinfish (Appeldoorn et al. 2015). The recreational harvest and recreational discards in pounds whole weight of queen triggerfish in Puerto Rico are reported in Table 5 in the Puerto Rico Final Stock Assessment Report (SEDAR 80 2022). Annual recreational harvest was variable and ranged from 495 (in 2011) to 36,978 lbs (in 2014) from 2000-2016.

Table 3.3.4. Recreational harvest of queen triggerfish (in pounds) in Puerto Rico for 2012-2016 (SEDAR 80, Table 5). Recreational harvest includes fish landed, used for bait, discarded and filleted. Recreational discards include fish released alive.

Year	Landings* (pounds)	Discards	Total
2012	11,021	0	11,021
2013	2,198	0	2,198
2014	36,978	0	36,978
2015	27,577	0	27,577
2016*	2,714	5,358	8,072

*2016 is considered to be the most recent year with complete landings.

3.4 Description of the Economic Environment

3.4.1 The Commercial Queen Triggerfish Sector

Queen triggerfish, while not generally targeted by the Puerto Rican commercial fishing sector, represents an important component to it given the fact that queen triggerfish tend to be caught in conjunction with a host of other species.[8] Reported landings of queen triggerfish averaged about 63,000 pounds annually during the 2012-2019 period and ranged from a low of 40,437 pounds in 2017 to a high of 76,826 pounds in 2012.[9] The annual value of these landings during the eight-year period averaged $112,309 based on an annual dockside price of $1.78 per pound which tended to increase during the period of analysis. Commercial queen triggerfish landings of 56,867 pounds in 2019 represented about 2.3% of the 2.5 million pound total commercial landings (see Table 3.3.1). The 2019 reported queen triggerfish price of $1.91 is less than one-half of the average price of all commercial landings ($4.88). Given the substantially lower price vis-à-vis the overall price, the 2019 value of queen triggerfish landings ($108,895) represented less than one percent of total seafood landings ($12.0 million).

[8] A list of species jointly landed with queen triggerfish is provided in Table 3.4.4.

[9] The low figure for 2017 reflect the impact of Hurricane Maria on the commercial fishing sector. Agar et al. (2020) suggest that the Hurricane caused "commercial landings to fall by 20% owing to the loss of productive assets, extended power outages, and the loss of customers."

Some of the increase in price during the eight-year period ending in 2019 reflects inflation. The inflation-adjusted price (i.e., adjusted for inflation to 2023 dollars based on the BEA Implicit Price Deflator) increased from an average of $2.14 per pound during 2012-2014 to $2.37 during 2017-2019, which indicates about a 10% increase in price per pound (Table 3.4.1).

Table 3.4.1. Reported commercial landings of queen triggerfish (pounds, value, and price) landed in Puerto Rico, 2012-2019.

Year	Landings (lbs)	Value		Average Price ($/lb)	
		Current	Inflation-Adjusted[a]	Current	Inflation-Adjusted
2012	76,826	$128,172	$171,294	$1.67	$2.23
2013	64,112	$99,538	$129,933	$1.55	$2.03
2014	71,791	$117,720	$151,728	$1.64	$2.11
2015	71,407	$117,092	$149,208	$1.64	$2.09
2016	66,160	$124,116	$156,873	$1.88	$2.37
2017	40,437	$86,946	$107,191	$2.15	$2.65
2018	57,089	$115,994	$140,599	$2.03	$2.46
2019	56,867	$108,895	$129,738	$1.91	$2.28
Average	63,086	$112,309	$142,008	$1.78	$2.25

[a] Values and prices were converted to 2023 dollars using the BEA Implicit Price Deflator (GDP Deflator by Year).

Commercial harvest of queen triggerfish by jurisdiction (i.e., state versus federal waters), based on weight, was presented in Table 3.3.2. The value of reported queen triggerfish landings by jurisdiction (Table 3.4.2), evaluated on a percentage basis, closely mirrors that of poundage indicating that the price differential between queen triggerfish caught in state waters and queen triggerfish caught in federal waters is minor. The information in Table 3.4.2 also indicates that the majority of queen triggerfish are taken from territorial waters rather than federal waters. During the five-year period ending in 2019, only about 10% of the reported landings were taken from federal waters if all of the 'unknown' catch is attributed to the state waters with the percentage increasing to about 15% if all of the 'unknown' catch is attributed to federal waters. The 'true' figure is probably closer to 10% given the dominance of reported landings from state waters.

Table 3.4.2. Inflation-Adjusted Value of Queen Triggerfish Landings by Jurisdiction, 2012-2019.

Year	Territorial Waters		Federal Waters		Unknown Waters	
	Inflation-Adjusted Value[a]	%of total	Inflation-Adjusted Value	% of total	Inflation-Adjusted Value	% of total
2012	$36,891	21.30%	$34,850	20.30%	$99,553	58.10%
2013	$81,991	63.10%	$22,093	17.00%	$25,861	19.90%
2014	$107,854	71.30%	$18,810	12.40%	$24,564	16.20%
2015	$106,159	71.10%	$25,408	17.00%	$17,641	11.80%
2016	$134,626	85.80%	$15,293	9.70%	$6,953	4.40%
2017	$96,147	89,7%	$6,190	5.80%	$4,854	4.50%
2018	131,262	93.40%	$6,576	4.70%	$2,761	2.00%
2019	$114,085	87.90%	$12,411	9.60%	$3,243	2.50%
Average	$101,126	71.20%	$17,704	12.50%	$23,179	16.30%

[a] Values were converted to 2023 dollars using the BEA Implicit Price Deflator (GDP Deflator by Year).

Premised on the assumption that underreporting of landings in Puerto Rico is the result of fishers underreporting harvests on their respective submitted trip tickets rather than a sizeable number of commercial fishermen not submitting trip tickets, one can evaluate the number of Puerto Rican commercial fisherman harvesting queen triggerfish, trips that resulted in the harvest of queen triggerfish, and relevant catch (pounds and revenues) per fisherman and trip (Table 3.4.3). During the 2012-2019 period, the number of fishers reporting the harvest of queen triggerfish from all waters fluctuated from a low of 217 in 2018 to 288 in 2015 with the eight-year average equaling 253.[10] The number of trips wherein queen triggerfish was harvested ranged from just over 2,000 (2017) to almost 4,000 in 2015 with the eight-year average equaling 3,297.[11] Revenues from the harvest of queen triggerfish (adjusted to 2023 dollars) averaged $567 per year among those fishers reporting the harvest of queen triggerfish while adjusted revenues per trip during the eight-year period averaged $44. The relatively low revenue figures reflect the fact that triggerfish are not a targeted species among the Puerto Rican commercial fishing sector.

[10] Based on the information in Table 3.3.1, the average number of commercial fishermen who reported the harvest of queen triggerfish during 2012-19 (i.e., 253) represented about one-third of the estimated 790 fishermen representing the commercial sector.

[11] This represents about 12% of the average annual number of trips taken by the commercial sector during the 2012-19 period (Table 3.3.1).

Table 3.4.3. Number of fishers, trips, and landings per fisher and trip (pounds and value) for commercial fishers of Puerto Rico who reported landings of queen triggerfish from all waters, 2012-2019.

Year	Number of Fishers	Number of Trips	Trips Per Fisher	Lbs. Per Fisher	Lbs. Per Trip	Inflation-Adjusted Revenues Per Fisher[a]	Inflation-Adjusted Revenues per Trip
2012	219	2,882	13.2	350.8	26.7	$782.20	$59.40
2013	280	3,593	12.8	229	17.8	$484.00	$36.10
2014	283	3,806	13,4	253.7	18.9	$534.40	$39.70
2015	288	3,993	13.9	247.9	17.9	$518.10	$37.40
2016	264	3,405	12.9	250.6	19.4	$594.20	$46.10
2017	221	2,133	9.7	183	19	$485.00	$50.30
2018	217	2,941	13.6	263.1	19.4	$647.90	$47.80
2019	255	3,623	14.2	223	15.7	$508.80	$35.80
Average	253	3,297	13	250.1	19.3	$566.80	$44.10

[a] Values (revenues) were converted to 2023 dollars using the BEA Implicit Price Deflator (GDP Deflator by Year).

As noted, an average of 63,086 pounds of queen triggerfish were landed on an annual basis during 2012-19 based on an average annual 3,297 trips. A large number of other species were also harvested on these trips (Table 3.4.4) with queen triggerfish representing only about 20% of the 313,859 pounds being annually landed (based on the average 3,297 annual number of trips). Spiny lobster, as indicated, represented the largest jointly landed species by pounds followed by lane snapper, parrotfishes, and red hind grouper.

Evaluated on a revenue basis, queen triggerfish landings, averaging $112,309 per year on a nominal basis ($142,632 expressed in $2023), represented only about 10% of the total revenues which averaged $1,149,126 per year ($1,459,390 when expressed in $2023). Total revenues per trip among those trips reporting queen triggerfish landings averaged $348 expressed on a nominal basis which equates to about $442 per trip when adjusted to 2023 dollars (based on the BEA Implicit Price Deflator). Spiny lobster, by comparison, represents more than one-half of the value of landings.

Table 3.4.4. Pounds and value of queen triggerfish and jointly landed species, all waters, 2012-2019 annual averages.

Species	Pounds	Value	Inflation-Adjusted Value[a]	% by Value
Triggerfish, Queen	63,086	$112,309	$142,632	9.77
Boxfish, Unspecified	17,603	$38,587	$49,005	3.36
Snapper, Lane	22,922	$56,602	$71,885	4.93
Porgy, Unspecified	7,799	$14,593	$18,533	1.27
Snapper, Yellowtail	14,345	$42,039	$53,390	3.66
Lobster, Spiny	96,815	$643,134	$816,780	55.97
Parrotfishes, Unspecified	21,486	$44,941	$57,075	3.91
Snapper, Mutton	11,710	$33,416	$42,438	2.91
Grunt, Unspecified	8,141	$13,408	$17,028	1.17
Snapper, Unspecified	9,413	$28,570	$36,284	2.49
Squirrelfish	2,831	$4,539	$5,764	0.39
Hogfish	16,859	$55,832	$70,907	4.86
Grouper, Red Hind	18,750	$55,662	$70,691	4.84
Goatfish, Spotted	2,098	$5,492	$6,975	0.48
Total	313,859	$1,149,126	$1,459,390	100

[a] The inflation-adjusted values are expressed in 2023 dollars based on the mid-point of the BEA Implicit Price Deflator during the 2012-2019 period. This explains the small difference between the average annual deflated value of queen triggerfish landings given in Table 3.4.1 and Table 3.4.4.

Three fishing methods – fish traps, spear fishing, and handlines – account for the vast majority of average annual queen triggerfish landings (Table 3.4.5). Comparison of the information in this Table with the information provided in Table 3.4.4 indicates that these three gears account for 94% of queen triggerfish landings by weight and approximately the same percentage by value. Fish traps and spear fishing both accounted for about the same proportion of average annual landings (41% and 44%, respectively), but the jointly landed species caught with these fishing methods were significantly different. As might be expected, spiny lobster was the dominant jointly landed species harvested by fish traps accounting for almost one-half of the total value of fish trap landings (those trips where queen triggerfish were also harvested) while queen triggerfish accounted for only about 10% of the total value of fish trap landings. By comparison, spiny lobsters accounted for only two percent of total revenue derived from queen triggerfish and jointly landed species harvested by spear fishing, and queen triggerfish accounted for 27% of that total. With respect to queen triggerfish and jointly landed species harvested by handlines, total revenue was dominated by yellowtail snapper (28%), red hind grouper (27%) and queen triggerfish (22%). The overwhelming majority of all catches by fishing method was taken in

state waters, from over 70% to about 90% depending upon how catches in 'unknown' waters are assigned.

Table 3.4.5. Pounds and value of queen triggerfish and co-occurring species, by fishing method, that were also harvested on these trips, 2012-2019 annual averages.

Species	Fish Traps			Spear Fishing			Handlines		
	Pounds	Value	% by Value	Pounds	Value	% by Value	Pounds	Value	% by Value
Triggerfish, Queen	26,148	$60,018	9.48	27,745	$57,205	26.86	5,218	$15,357	21.73
Boxfish, Unspecified	13,243	$35,093	5.44	3,400	$10,935	5.14	84	$284	0.4
Snapper, Lane	20,450	$63,097	9.97	261	$1,030	0,48	1,742	$6,087	8.61
Porgy, Unspecified	7,075	$16,821	2.66	145.0	$400	0.19	304	$672	0.95
Snapper, Yellowtail	8,033	$28,903	457	479	$1,581	0.74	5,001	$19,830	28.06
Lobster, Spiny	34,893	$303,868	48.01	505	$4,136	1.94	7.0	$55	0.08
Parrotfishes, Unspecified	9,352	$24,966	3.94	6,784	$25,740	12.09	428	$1,876	2.65
Snapper, Mutton	7,364	$27,435	4.33	3,462	$11,601	5.44	597	$2,235	3.16
Grunt, Unspecified	7,356	$14,312	226	168	$605	0.28	253	$653	0.92
Snapper, Unspecified	4,278	$12,614	1.99	3,879	$18,588	8.73		$2,271	3.21
Squirrelfish	2,434	$4,831	0.76	23	$69	0.03	257	$594	0.84
Hogfish	4,397	$15,834	2.5	11,678	$51,608	24.24	212	$1,116	1.57
Grouper, Red Hind	4,954	$18,344	2.9	8,715	$29,417	13.81	4,116	$19,627	27.77
Goatfish, Spotted	26,034	$6,755	1.07	6.0	$25	0.01	4.0	$14.0	0.02
Total	152,010	$632,893	100	70,401	$212,942	100	18,765	$70,673	100

[a] The adjusted values are expressed in 2023 dollars based on the mid-point of the BEA Implicit Price Deflator during the 2012-2019 period.

3.4.2 The Recreational Sector

The estimated number of recreational angler trips taken in Puerto Rico during 2012-2016 averaged 543,300 annually and ranged from a low of 350,600 in 2012 to a high of 667,600 in 2015 (Table 3.4.6).

Recreational angler trips, as collected under the Marine Recreational Information Program (MRIP) program, are segmented by whether the trip is from shore, private boat, or charter.

Shore fishing accounts for about 50% of total trips and angler trips on private boats and charter boats account for the other 50% of total trips from 2012 through 2016.

Table 3.4.6. Estimated recreational angler trips in Puerto Rico by mode, 2012-2016.

Year	Shore	Charter	Private	Total	Shore	Charter	Private	Total
2012	140,300	1,800	208,500	350,600	40.00%	0.50%	59.50%	100.00%
2013	275,100	6,500	228,700	510,300	53.90%	1.30%	44.80%	100.00%
2014	275,600	.	258,900	534,500	51.60%		48.40%	100.00%
2015	368,500	2,400	296,700	667,600	55.20%	0.30%	44.40%	100.00%
2016	309,500	.	344,100	653,600	47.40%		52.70%	100.00%
Average	273,800		267,400	543,300	49.60%	0.40%	50.00%	100.00%

Of the average 543,000 angler trips taken annually in Puerto Rico waters during 2012-2016, about 50% of these trips (an estimated 271,000 annually) were reportedly taken in state ocean waters, while 9.7% of the trips (52,800 annually) were taken in federal ocean waters (remaining angler trips are inland). As discussed in Section 3.3.1.2, recreational landings of queen triggerfish are highly variable. Furthermore, because there is no current recreational data or monitoring to set new sector ACLs, the percentages of the total ACL would remain the same as those established under the Puerto Rico FMP (Recreational ACL is 8.23% of the total ACL, as established under the Puerto Rico FMP).

3.5 Description of the Social Environment

This section describes key social aspects of the queen triggerfish or *peje puerco* fishery as it is conducted in the island settings of Puerto Rico. The emphasis here is on identification and basic characterization of communities where residents commonly pursue the species on an artisanal basis as determined through analysis of recent landings data and information derived from discussion with key persons involved in the fishery and its management. Social indicators data and various secondary source materials enable additional descriptive context. Finally, the section attends to environmental justice and equity concerns by identifying community-level vulnerabilities to prospective social change in areas where queen triggerfish is most commonly harvested. The section in total provides essential context for the social effects analysis provided in Chapter 4. Readers are referred to a variety of sources for additional information regarding social aspects of fishing and fisheries around Puerto Rico, including but not limited to the Puerto Rico FMP (CFMC 2019), and Amendment 1 to the Puerto Rico FMP (i.e., Buoy Gear Amendment) (CFMC 2022), which are incorporated herein by reference.

3.5.1 Social-Environmental Overview of the Fishery

Puerto Rico fisheries as a whole are fairly characterized as artisanal in nature (Agar et al. 2020). Most harvesters who sell all or some portion of their catch use relatively small vessels, employ few crewmembers, and utilize a variety of gear types suited to a shifting suite of target species over the course of a given year (Agar and Shivlani 2017). The term "consumptive-oriented" is also useful for characterizing island fisheries—especially for species such as queen triggerfish, which is commonly consumed in the immediate and/or extended family settings of its harvesters, or often transacted in seafood markets for consumption in other familial and community settings around the archipelago. The species is also purchased at times by island restaurateurs who prepare the fish for sale to local residents and tourists alike, often as a key ingredient in locally savored *empanadillas*. From an operational perspective, queen and other triggerfish species are typically pursued through deployment and retrieval of fish traps, or by divers who harvest the fish more directly, and ideally in relatively calm conditions, using highly efficient spearguns or more rudimentary slings and spears.

Given that the reef-associated triggerfish species are known to exhibit high levels of fidelity to specific areas during much of a given year (Bryant et al. 2019), knowledge of nearshore and offshore reef ecosystems and the preferred locations and behaviors of triggerfish populations are key elements to success among prospective harvesters. Such information is both commonly guarded between, and often transmitted within social networks around Puerto Rico (Ramos et al. 2023; Garcia-Quijano 2009), as is knowledge of ocean fishing as a whole. Such knowledge includes: (a) experiential understanding of targeted and alternative species and their habitats and prey; (b) vessel navigation in various (often challenging) sea states; (c) harvesting techniques; (d) proper maintenance of vessels, engines, gear and electronics; (e) going market prices; and (f) other core aspects of work and non-commercial pursuit of marine resources on the ocean.

As for most artisanal fisheries around the world, many Puerto Rico harvesters supplement fishing income with that generated through other forms of work (Valle-Esquivel et al. 2011), and many combine sale of seafood with sharing and barter of such products in extended family and community settings. Opportunities for expansion of sales are limited in the absence of an export market, though as noted above, tourists arriving from around the world generate much demand for local seafood products (Matos-Caraballo and Agar 2011). Dependence on tourism can be problematic in this setting, however, as was the case after Hurricane Maria in 2017 and during the first years of the COVID-19 pandemic when rates of visitation and related demand for seafood products fell precipitously, with detrimental economic effects on local fleets, seafood dealers, restaurants, and resorts (see Agar et al. 2020; Agar et al. 2022). Key persons contacted to assist in development of this summary analysis report that although certain families and communities continue to experience problems resulting from these events, cooperative efforts to perpetuate island fisheries have played an important role in movement toward recovery in numerous communities around the archipelago.

3.5.2 Community Involvement in the Puerto Rico Queen Triggerfish Fishery

Based on analysis of territorial and federal landings data, the vast majority (~91%) of queen triggerfish landings occur via fishing effort in the territorial waters of Puerto Rico. Data regarding other island fisheries, fishing challenges related to the greater depths of most reef systems in more distant offshore zones, and discussions with fishery participants make clear that very few persons capture the species in federal waters only. Participants also report that triggerfish are most typically captured incidentally during pursuit of the wider range of reef-associated species. Patterns in the community-specific distribution—or regional quotient—of commercial queen triggerfish landings are indicated in Figure 3.5.1 below, which depicts those *municipios* where the species was most commonly landed subsequent to fishing effort in both the territorial and federal jurisdiction waters of Puerto Rico during the period 2015 through 2019. The regional quotient can also be defined as the share of *municipio*-specific landings divided by landings accruing to fleets across the archipelago as a whole. As indicated in the graphic, the highest percentage of landings occurred in the municipalities of Cabo Rojo, Juana Diaz, and Guayama during the time-series, with smaller percentages accruing to seven additional communities: Naguabo, Fajardo, Salinas, Vieques, Peñuelas, Arecibo, and San Juan. Much smaller percentages of queen triggerfish were landed elsewhere during the period, including the island of Culebra, where Puerto Rico fisheries research specialist Gómez-Andujar reports extensive consumption of triggerfish by a relatively small local population (Nicolás Gómez-Andujar, pers. comm., 2024).

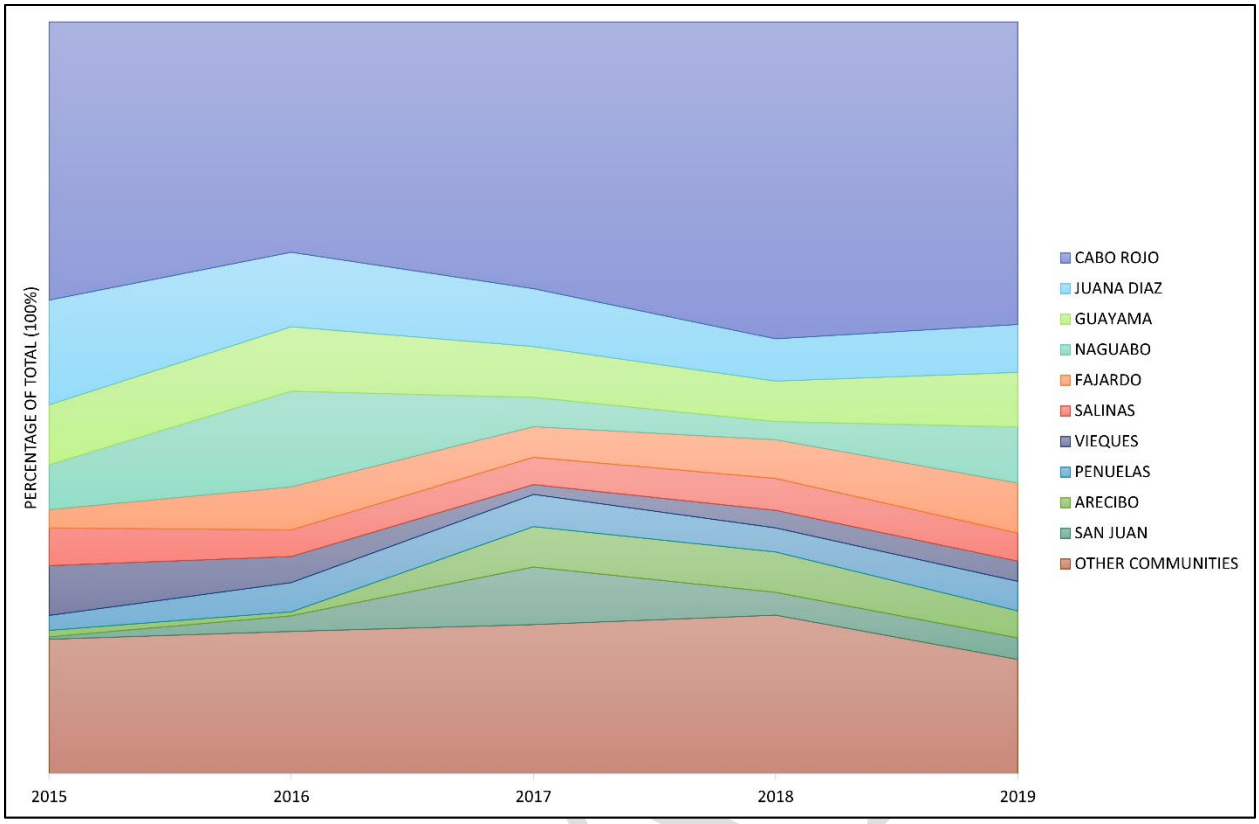

Figure 3.5.1. Community-specific commercial landings of queen triggerfish around Puerto Rico: 2015-2019.
Source: SEFSC, Community ALS File, accessed March 2024.

The distribution of commercial queen triggerfish landings can also be considered in relation to overall levels of community engagement in marine fisheries around the archipelago. Relative levels of engagement are depicted in Figure 3.5.2 below. For example, the *municipio* with the greatest percentage of queen triggerfish landings—Cabo Rojo (along the west coast)—is collectively highly engaged in the commercial/artisanal harvest of seafood overall, while Guayama (along the south coast) is somewhat less engaged, and Juana Diaz (also along the south coast) is the relatively least engaged of the three—irrespective of its relatively extensive landings of queen triggerfish. Figure 3.5.3 below also illustrates varying levels of engagement in, and also reliance on, marine fisheries around the archipelago—in this case among each of the ten leading queen triggerfish landings communities. Notable here are the extensive levels of engagement and also reliance on the part of Cabo Rojo and also Fajardo (east coast), and the extensive level of reliance among residents of Vieques (offshore island east of Puerto Rico). By definition, the measure of engagement provided here is a generalizable composite indicator based on: (a) pounds of fish landed annually by local commercial/artisanal fleets, (b) associated ex-vessel revenue, and (c) the number of active locally based harvesters and dealers. The measure of reliance incorporates the same variables divided by the local population figure.

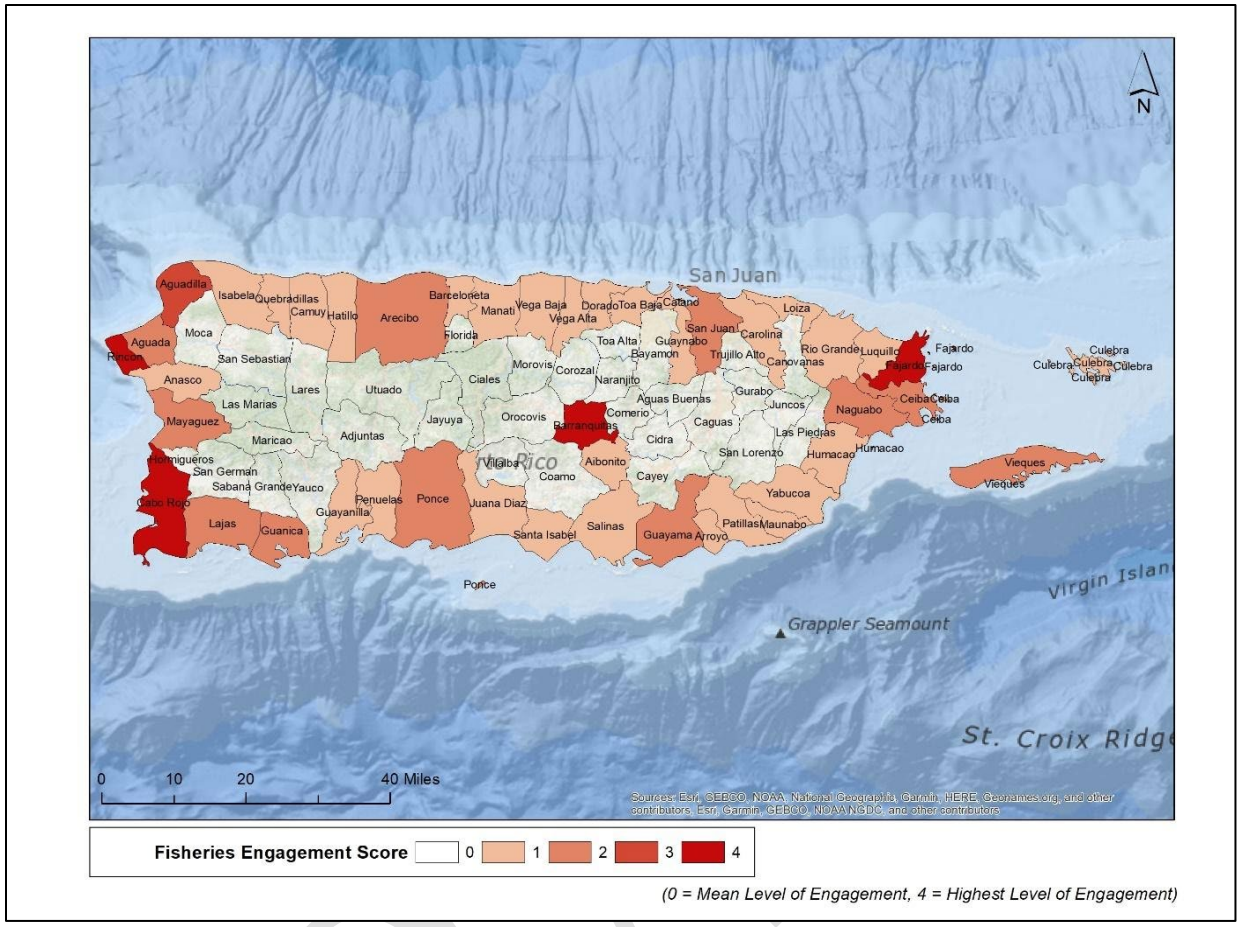

Figure 3.5.2. Commercial/artisanal fisheries engagement: Municipios de Puerto Rico 2015-2019.

Source: SERO/SEFSC ALS database, accessed January 2023.

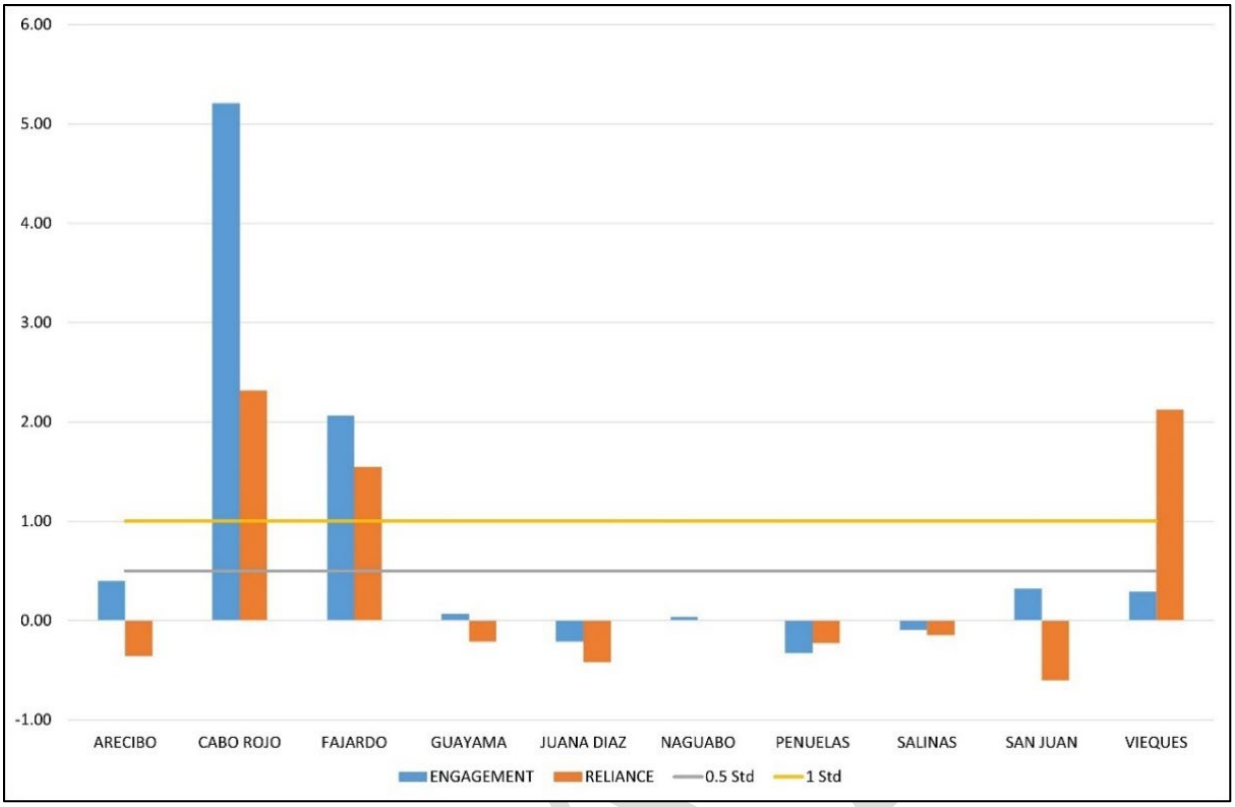

Figure 3.5.3. Measures of engagement and reliance among Puerto Rico municipios with the greatest volume of commercial queen triggerfish landings during the period 2015-2019. Source: SERO/SEFSC ALS Database, accessed January 2023.

As discernible from the graphics, variation in engagement and reliance is extensive. Such variability can be explained in part through examination of the local quotient (LQ). In essence, the LQ metric speaks to the local importance of the species in question in relation to all other species harvested by the local fleet during a given time period. In this case, landings of queen triggerfish are considered in relation to all seafood landings accruing to the leading queen triggerfish landings communities during 2019 (Figure 3.5.4 below). Here it can be discerned that the volume of commercial queen triggerfish landings is, in absolute terms, most extensive in the municipios of Guayama and Juana Diaz, but less extensive in municipios such as Cabo Rojo and Fajardo (as examples). This is sensible insofar as Cabo Rojo and Fajardo are relatively more extensively engaged in the commercial/artisanal harvest of seafood overall.

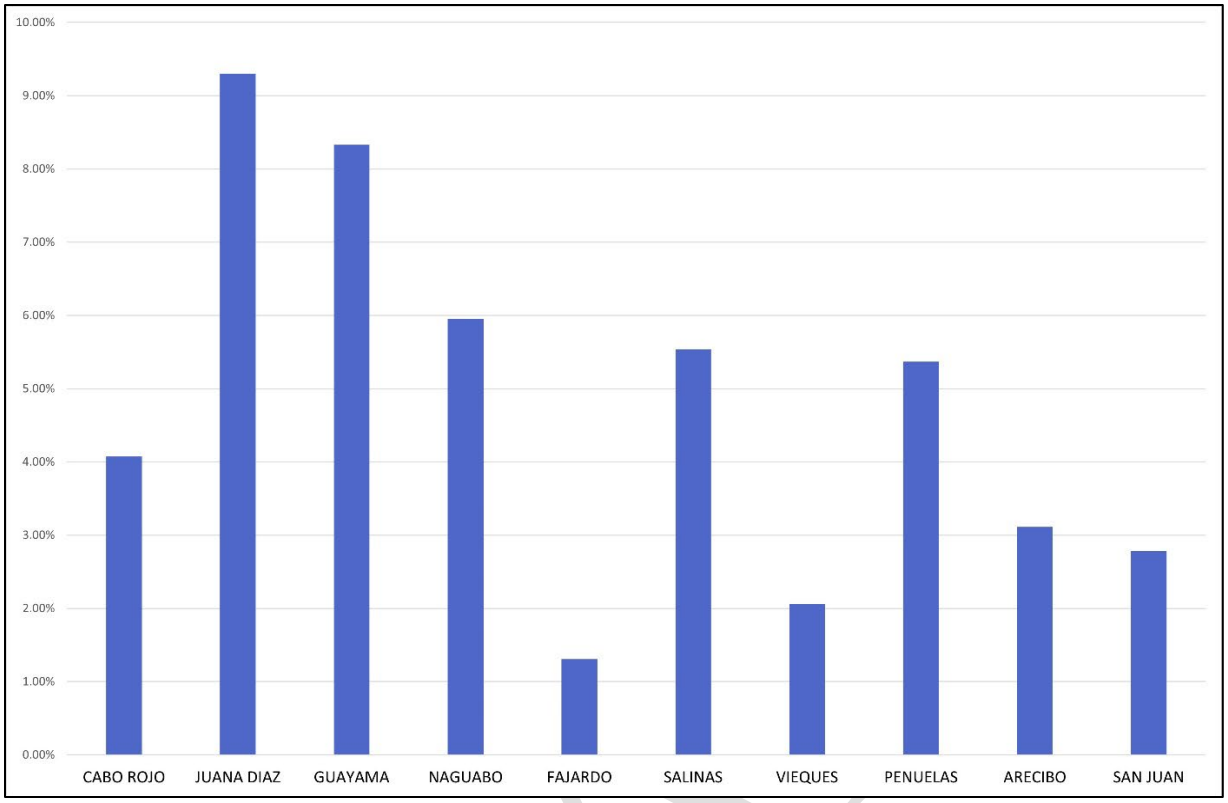

Figure 3.5.4. Local quotient of queen triggerfish commercial landings among municipios with the highest absolute percentage of such landings in 2019.
Source: SEFSC Community ALS data file, accessed January 2023.

3.5.3 Recreational Pursuit of Queen Triggerfish around Puerto Rico

Relatively little documentation of the manner and extent of recreational pursuit of queen triggerfish around Puerto Rico has occurred in recent decades. Nuttall and Matter (2021) report basic landings information for the recreational sector for the years in which the MRIP program was active in the archipelago (2000-2017[12]), with tabulated data indicating only trace landings by charter vessel or shoreline modes during the period. Landings by persons operating private vessels vary extensively in this dataset, with a low of 240 captured fish documented in 2011, and a peak of 17,933 fish documented in 2014. While modes of capture are not documented, the vast majority of fish were retained during the entire period. Given that commercial/artisanal harvest of the species occurs primarily in territorial waters, logic holds that private vessel-based recreational pursuit of the species most likely occurs primarily in the same zone. Of note here is a recent trend in the number of for-hire vessels operating around the archipelago, with 12 such operations reportedly active in 2021, 28 active in 2022, and 58 active in 2023 (Y. Rodriguez, Puerto Rico DNER, pers. comm. March 12, 2024). Some such operations provide free-dive and

[12] Data collected for 2017 are not for the entire calendar year.

scuba-based options for pursuing reef fish and other resources using spear guns and/or slings, and thus there is potential for increased capture of queen triggerfish using these methods via the charter boat mode. Based on landings data regarding commercial/artisanal pursuit of the species, it is likely that capture of the species rarely occurs via hook-and-line, and that such capture likely is incidental in nature. Again, such specific activities and outcomes presently are not well-documented in the region.

3.5.4 Environmental Justice Considerations

Executive Order 12898 (Environmental Justice) was established in 1994 to require that federal actions be undertaken in a manner that identifies and avoids adverse human health and/or social and economic effects among low-income and minority groups and populations around the nation and its territories. That is, federal regulatory decisions must be undertaken in ways that ensure no individuals or populations are excluded, denied the benefits of, or are subjected to discrimination due to "race, color, or nation of origin." Of relevance in the context of marine fisheries, federal agencies are further required to collect, maintain, and analyze data regarding patterns of consumption of fish and wildlife among persons who rely on such foods for purposes of subsistence. Established in 2021, *Executive Order 13985* calls for human equity in the context of federal decision-making and policy actions. Titled "Advancing Racial Equity and Support for Underserved Communities through the Federal Government," the new order requires that federal policies and programs are designed and undertaken in a manner that delivers resources and benefits equitably to all citizens, including members of historically underserved communities. The phrase "underserved communities" refers to populations and persons that have been systematically denied full and equitable opportunity to participate in economic, social, and civic aspects of life in the nation. Significantly, citizens of the nation's territories are in their entirety deemed underserved communities. Finally, *Executive Order 14008*, established in 2021, calls on agencies to make achievement of environmental justice part of their missions "by developing programs, policies, and activities to address disproportionately high and adverse human health, environmental, climate-related and/or other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts."

Various data are available to indicate environmental equity and justice issues among persons residing in underserved communities potentially affected by federal regulatory and other actions. Community-specific rates of poverty, number of households maintained by single females, households with children under the age of five, crime rates, and rates of unemployment also exemplify the types of information useful for identification and analysis of community-level vulnerabilities (see Jacob et al. 2013; Jepson and Colburn 2013).

Three composite indices—personal disruption, population composition, and poverty —are applied here to indicate relative degrees of vulnerability among municipios where residents are engaged in the queen triggerfish fishery discussed in this amendment. Mean standardized

community vulnerability reference points for each region are provided along the y-axis in the graphics, with means for the vulnerability measures and threshold standard deviations depicted along the x-axis. Scores that surpass the 0.5 standard deviation level indicate vulnerability to sources of social change, including new fishing regulations.

Figure 3.5.5 below makes patently clear that social vulnerabilities are common among all the Puerto Rico municipalities where queen triggerfish landings have been documented in recent years. As depicted in the figure, the one-half standard deviation vulnerability threshold for personal disruption is exceeded for Fajardo, Juana Diaz, and Naguabo, while the threshold for population composition is exceeded in Arecibo, Cabo Rojo, Fajardo, Salinas, San Juan, and Vieques. While the poverty threshold for Puerto Rico is exceeded in Cabo Rojo, Guayama, Penuelas, and Vieques, it should be noted that all of the leading queen triggerfish landings communities register very high rates of poverty when compared with counties and municipalities on the U.S. mainland.

Particularly notable in Table 3.5.1 below are inordinately high percentages of persons in poverty across the subject municipios, and the attrition of local populations between both the 2010 and 2020 census counts, and the 2020 count and 2023 population estimates. Social vulnerabilities and associated challenges are ongoing across the archipelago.

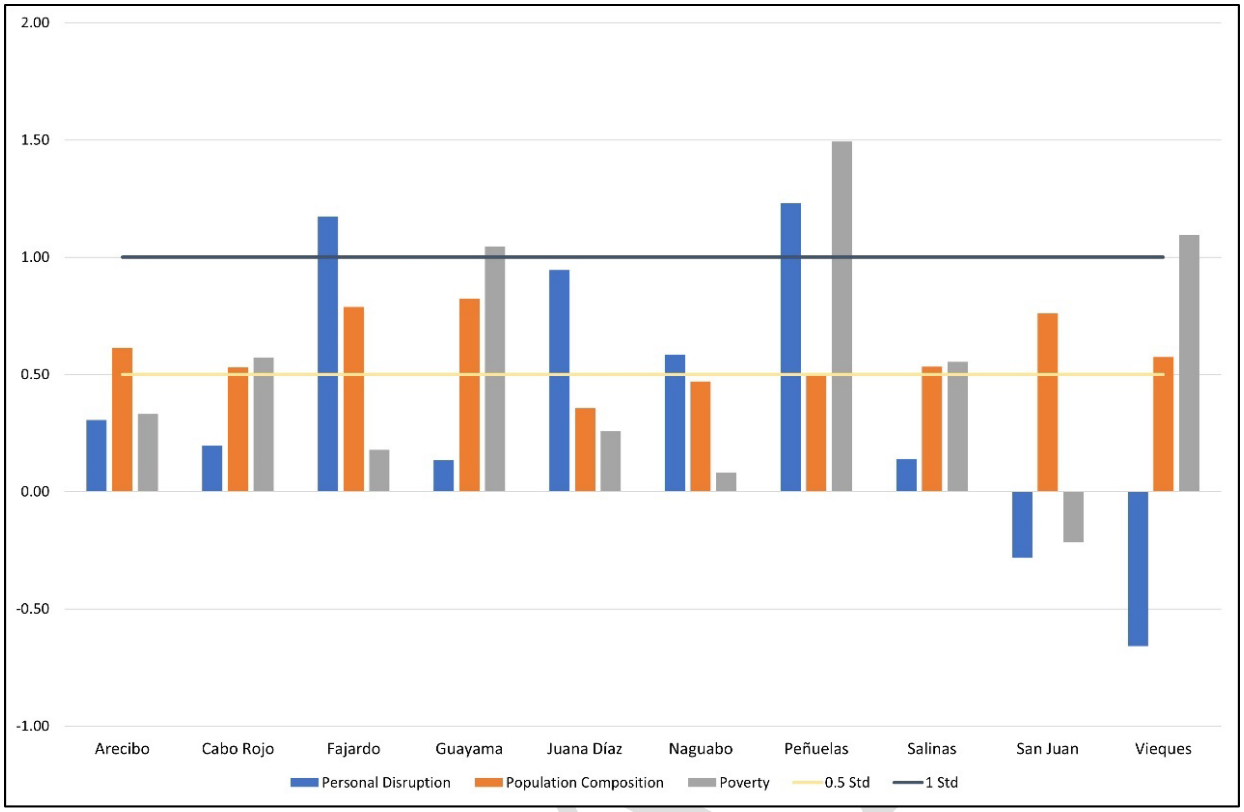

Figure 3.5.5. Social vulnerability indices for Puerto Rico municipalities most deeply involved in harvest of queen triggerfish during the 2015-2019 time-series.
Source: SERO/SEFSC Community Social Vulnerability Indicators database, accessed March 2024.

Table 3.5.1. Select demographic conditions among Puerto Rico communities with the most extensive landings of queen triggerfish.

Municipio	2020 Population	Population change: 2010-2020	2023 Population	% Persons in poverty: 2020	% Hispanic/ Latino
Cabo Rojo	47,158	-3,759 / -7.4%	46,645	47.6	98.8
Juana Diaz	46,538	-4,209 / 8.3%	45,919	44.3	99.8
Guayama	36,614	-8,748 / -19.3%	34,765	50.6	99.3
Naguabo	23,386	-3,334 / -12.5%	22,838	50.4	99.2
Fajardo	36,993	-4,869 / -13.2%	31,166	42.7	98.2
Salinas	25,789	-5,289 / -17%	24,718	50.5	99.0
Vieques	8,249	-1,052 / -10.2%	7,999	54.1	94.5

Sources: U.S. Census Bureau (2023, 2021, 2020).

3.6 Description of the Administrative Environment

The administrative environment is discussed in detail in the Puerto Rico FMP, which is incorporated herein by reference and summarized below.

3.6.1 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 nm from shore, as well as authority over U.S. anadromous species and continental shelf resources that occur beyond the EEZ.

Responsibility for federal fishery management decision-making is divided between the U.S. Secretary of Commerce (Secretary) and eight regional Fishery Management Councils that represent the expertise and interests of constituent states. 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 proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act, and with other applicable laws summarized in Appendix B. In most cases, the Secretary has delegated this authority to NMFS.

The Caribbean Fishery Management Council is responsible for the conservation and management of fishery stocks within federal waters surrounding Puerto Rico and the USVI. These waters extend to 200 nautical miles offshore from the seaward boundaries of Puerto Rico (9 nm from shore) and the USVI islands of St. Croix, St. Thomas/St. John (3 nm from shore). The Council consists of seven voting members: four members appointed by the Secretary, at least one of whom is appointed from each of the Commonwealth of Puerto Rico and the Territory of the USVI; the principal officials with marine fishery management responsibility and expertise for the Commonwealth of Puerto Rico and the Territory of the USVI, who are designated as such by their Governors; and the Regional Administrator of NMFS for the Southeast Region.

The public is involved in the fishery management process through participation at public meetings, on advisory panels and through council meetings that, with few exceptions for discussing personnel matters, are open to the public. The regulatory process is in accordance with the Administrative Procedure 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.

3.6.2 Puerto Rico Fisheries Management

The Commonwealth of Puerto Rico has jurisdiction over commonwealth fisheries in waters extending up to 9 nm from shore. Those fisheries are managed by Puerto Rico's Department of Natural and Environmental Resources per Puerto Rico Law 278 of November 29, 1998 as amended, known as Puerto Rico's Fisheries Law, which establishes public policy regarding fisheries. 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 Fishing Regulations 6902, implemented in 2004, included regulations for the management of marine managed areas for fisheries purposes and imposed regulations for the protection of several species such as the Nassau grouper and the red hind. Puerto Rico Regulations 7949, implemented in 2010, is the current regulatory mechanism for management of fishery resources in Puerto Rico territorial waters as well as for those resources and areas with shared jurisdiction with the U.S. government through the Council.

Chapter 4. Environmental Consequences

4.1 Action: Update Reference Points for the Triggerfish Stock Complex under the Puerto Rico FMP

Summary of Alternatives

Alt. 1	Alt. 2	Alt. 3 (Preliminary Preferred)	Alt. 4
No action. Retain reference points for the triggerfish complex specified in the Puerto Rico FMP	Update reference points based on SEDAR 80 and set the total ACL = ABC	Update reference points based on SEDAR 80 and set the total ACL = ABC X 0.95	Update reference points based on SEDAR 80 and set the total ACL = ABC X 0.90

4.1.1 Effects on the Physical Environment

Effects on the physical environment generally occur from fishing effort associated with interactions between fishing gear (e.g., fish traps) and the bottom substrate or from anchoring. The analysis below assumes that (1) harvest would be constrained to the annual catch limits (ACL), and (2) the amount of harvest correlates to interactions between fishing gear and anchors and the bottom.

No effects on the physical environment would be expected from **Alternative 1** (No Action) as the catch levels would not change (no changes in fishing effort from the baseline), thus current interactions with the substrate from gear and anchors would not change.

The total ACL under **Alternative 2** would be the highest total ACL compared to the other alternatives, including the baseline (**Alternative 1**). Therefore, **Alternative 2** would be expected to provide the least benefits to the physical environment, under the assumption that increased ACLs translates to increased landings, which could increase bottom-impacting gear use. The total ACL under **Alternative 3** (**Preliminary Preferred**) would be less than the total ACL under either **Alternative 1** or **Alternative 2**, thereby reducing the potential impacts to the bottom from the baseline. The ACL under **Alternative 4** would specify the lowest ACL among the alternatives, and thus, would be expected to provide the greatest benefit to the physical environment under the specified assumptions discussed above.

Notwithstanding the above, in a multi-species fishery, where triggerfish species and other fish species are often caught together in trap gear, reducing harvest of one stock but allowing harvest of others may not reduce overall trips taken or gear hauled and may not generate associated positive effects to the physical environment. The above discussion for **Alternative 3 (Preliminary Preferred)** and **Alternative 4** would represent the greatest potential benefits to the physical environment. This benefit could be reduced depending on the extent to which fishermen fish for other species with the same or more damaging gear to offset the lower ACL proposed, which in turn depends on market conditions and other factors affecting the ability to alter fishing practices, or if fishers shift effort to state waters where ACLs are not applicable. Those factors are difficult to predict.

4.1.2 Effects on the Biological/Ecological Environment

Management actions that affect the biological and ecological environment mostly relate to the impacts of fishing on a species' population size, life history, and the role of the species within its habitat. Removal of the species from the population through fishing reduces the overall population size if harvest is not maintained at sustainable levels. Indirect impacts of these alternatives on the biological environment would depend on the corresponding reduction or increase in the level of fishing as a result of each alternative. Fishing gear has different (1) selectivity patterns that are used to target and capture organisms by size and species, (2) number of discards, which are often sublegal sized individuals or species caught during seasonal closures, and (3) mortality rates associated with releasing the species.

Alternative 2, Alternative 3 (Preliminary Preferred), and **Alternative 4** would specify management reference points based on the best scientific information available (overfishing limit [OFL] and acceptable biological catch [ABC] values would be the same, and only the ACLs would differ). This would ensure that federally managed stocks are harvested sustainably while protecting reproductive capacity and maintaining effective ecological contributions. **Alternative 2** proposes an increase in the harvest level from the current level (i.e., **Alternative 1**) and this could have short-term negative effects to the biological/ecological environment through increased removals, but long-term positive effects through the enhanced management to the maximum sustainable yield. **Alternative 2** would likely provide the least biological benefit compared to the other alternatives, assuming landings increase due to increased ACL. The ACL under **Alternative 3 (Preliminary Preferred)** would be less than that under **Alternative 2** and have a greater biological benefit than **Alternatives 1** or **2**. **Alternative 4** would have the greatest biological benefits through an increased protection to the stock from fishing (i.e., the greatest reduction in allowable harvest) when compared to **Alternative 1, Alternative 2,** and **Alternative 3 (Preliminary Preferred)** under the specified assumptions discussed above.

Any biological/ecological effects from this action are not expected to be significant because the overall prosecution of the Puerto Rico fishery that targets species in the Triggerfish stock

complex is not expected to change. For this same reason, no additional impacts to Endangered Species Act (ESA) listed species or designated critical habitat, or other non-targeted species are anticipated as a result of this action.

4.1.3 Effects on the Economic Environment

Alternative 1 (No Action) would maintain the current reference points (OFL and ABC), status determination criteria and, the total and commercial and recreational ACLs for the Triggerfish stock complex. Therefore, **Alternative 1** (No Action) would not change fishing practices or recreational and commercial harvest of the triggerfish species included in the triggerfish stock complex (queen triggerfish, ocean triggerfish, and gray triggerfish) and would not result in economic effects. However, **Alternative 1** is not consistent with SEDAR 80, and is not a viable alternative because it is not based on the best scientific information available.

Alternatives 2, **3 (Preliminary Preferred)** and **4**, would modify the reference points, status determination criteria and total and sector ACLs for the Triggerfish stock complex based on SEDAR 80. Table 4.1.1 provides the reference points, stock ACLs, ratio of ABC to OFL (ABC/OFL) and ACL to ABC (ACL/ABC) by alternative.

Table 4.1.1. OFL, ABC, Stock ACL in pounds (lbs) whole weight (ww) and ratios of ABC to OFL and ACL to OFL by alternative.

Alternative	OFL	ABC	ACL	ABC/OFL	ACL/ABC
Alternative 1	190,636	95,318	90,552	50.00%	95.00%
Alternative 2	118,283	91,810	91,810	77.62%	100.00%
Alternative 3	118,283	91,810	87,220	77.62%	95.00%
Alternative 4	118,283	91,810	82,629	77.62%	90.00%

Relative to **Alternative 1** (No Action), **Alternatives 2-4** would set a smaller buffer between the OFL and the ABC. Although a smaller buffer between the OFL and ABC would generally increase the likelihood that the OFL could be exceeded, such an inference cannot be made because the OFL set in **Alternative 1** is not consistent with the best scientific information available. Therefore, economic effects would not be expected to result from the smaller buffer set in **Alternatives 2-4** relative to **Alternative 1**. It is also noted that because the maximum sustainable yield proxy, maximum fishing mortality threshold, and minimum stock size threshold were defined but not quantified due to data limitations, inferences about potential economic effects that could result from the redefinition of these status determination criteria cannot be made.

Alternative 2 would not set a buffer between the ABC and stock ACL. **Alternative 3** (**Preliminary Preferred**) and **Alternative 4** would set a 5% and a 10% buffer between the ABC

and the stock ACL, respectively. **Alternative 4**, which would set the widest buffer between the ABC and ACL, constitutes the alternative that accounts the most for management uncertainty. **Alternative 4** would potentially result in the greatest benefit to the triggerfish stock complex and would therefore be expected to result in the greatest potential economic effects associated with the expected increased protection to the stock in the long run.

As indicated in Table 4.1.1, relative to **Alternative 1**, **Alternative 2** would increase the stock ACL. **Alternatives 3** and **4** would decrease the stock ACL relative to the no action alternative **(Alternative 1**). Economic effects expected to result from ACL changes considered in **Alternatives 2-4** are evaluated based on corresponding changes to the commercial and recreational ACLs.

For the commercial sector, economic effects expected to result from ACL changes proposed in **Alternatives 2-4** are evaluated based on associated changes in commercial triggerfish revenues. For each alternative, Table 4.1.2 provides commercial triggerfish ACLs, and differences between the proposed ACLs and the status quo ACL. The ACL changes are expressed in pounds ww and in nominal and in inflation-adjusted revenues. Changes in nominal and inflation-adjusted ($2023) commercial revenues from triggerfish are computed using 2015-2019 average nominal and real prices per pound derived from Table 3.4.1. Between 2015 and 2019, average nominal and real prices per pound of triggerfish are estimated at $1.89 and $2.34 ($2023). For each alternative, Table 4.1.2. provides commercial ACLs and changes in commercial ACLs expressed in pounds and in nominal and real ($2023) values.

Table 4.1.2. Commercial triggerfish ACLs and differences relative to **Alternative 1** in pounds, nominal and $2023 values.

Alternative	Commercial ACL (lbs ww)	Difference relative to **Alternative 1** (lbs ww)		
		Pounds (ww)	Revenues	
			Nominal	($2013)
Alternative 1	83,099	NA	NA	NA
Alternative 2	84,254	1,155	$2,183	$2,703
Alternative 3	80,041	-3,058	-$5,780	-$7,156
Alternative 4	75,829	-7,270	-$13,740	-$17,012

These estimated changes in commercial revenue from triggerfish will only materialize if commercial fishermen harvest the totality of the allotted commercial ACL under each alternative. Changes in commercial triggerfish ACL from the status quo range from -7,270 lbs ww (**Alternative 4**) to 1,155 lbs ww (**Alternative 2**). **Alternative 3** (**Preliminary Preferred**)

would change the commercial ACL by -3,058 lbs ww. In nominal values, corresponding changes in commercial revenues are estimated to range from -$13,740 (**Alternative 4**) to $2,183 (**Alternative 2**). **Alternative 3** (**Preliminary Preferred**) would change commercial revenues from triggerfish by -$5,780. In inflation-adjusted values, changes in commercial revenues are estimated to range from -$17,012 (**Alternative 4**) to $2,703 (**Alternative 2**). **Alternative 3 (Preliminary Preferred)** would change commercial revenues from triggerfish by -$7,156. Based on Table 3.4.1, commercial queen triggerfish landings, which account for the quasi-totality[13] of triggerfish landings in Puerto Rico, averaged 58,392 lbs ww between 2015 and 2019. Because commercial queen triggerfish landings are well below the proposed commercial ACLs, it is unlikely that the ACL changes in **Alternatives 2-4** would affect commercial landings in the short term. It follows that estimated associated changes in commercial revenues are not likely to materialize under present and foreseeable conditions. Economic effects expected to result from commercial ACL changes and corresponding landings changes would typically include changes in producer surplus to commercial fishermen as well as changes in consumer surplus to consumers purchasing triggerfish; however, no changes in commercial landings are expected.[14]

For the recreational sector, economic effects expected to result from changes in recreational ACLs proposed in **Alternatives 2-4** are evaluated based on associated changes in recreational value, i.e., changes in consumer surplus from triggerfish. For each alternative, Table 4.1.3 provides recreational triggerfish ACLs, and differences between the proposed ACLs and the status quo ACL.

Table 4.1.3. Recreational triggerfish ACLs and changes relative to **Alternative 1**.

Alternative	Recreational ACL (lbs ww)	Difference relative to **Alternative 1** (lbs ww)
Alternative 1	7,453	NA
Alternative 2	7,556	103
Alternative 3	7,178	-275
Alternative 4	6,800	-653

Changes in recreational triggerfish ACL range from -653 lbs ww (**Alternative 4**) to 103 lbs ww (**Alternative 2**). **Alternative 3** (**Preliminary Preferred**) would change the recreational ACL by

[13] Recall that queen triggerfish is one of three species that make up the Triggerfish stock complex, and its landings represent almost all landings of the complex.

[14] If there were changes in landings, estimates of changes in either producer surplus or consumer surplus could not be generated because of data limitations.

-275 lbs ww. For **Alternative 2**, associated increases in consumer surplus to Puerto Rico anglers would only be expected to materialize if recreational landings exceed the status quo recreational ACL. For **Alternatives 3** and **4**, associated decreases in consumer surplus to Puerto Rico anglers would only be expected to materialize if recreational landings are constrained at the ACLs considered in **Alternatives 3** or **4**. Due to the unavailability of recent recreational triggerfish landings data and of consumer surplus estimates per recreationally-caught triggerfish, potential economic effects expected to result from ACL changes considered in **Alternatives 2-4** cannot be quantified at this time. However, it can be inferred that larger recreational ACL changes relative to **Alternative 1** would correspond to potentially greater associated economic effects.

4.1.4 Effects on the Social Environment

Because **Alternative 1** would maintain the existing management reference points for the triggerfish stock complex as provided in the Puerto Rico FMP, management of the complex would therefore proceed without attention to the best possible scientific information available for ensuring stock sustainability over time. This would, in turn, heighten the potential for detrimental *long-term* impacts among fishery participants who pursue the species for commercial/artisanal and recreational purposes. Such impacts would potentially include: (a) diminished fishing-related income, (b) reduced opportunities for developing and refining knowledge of the marine environment and perpetuating fishing-specific traditions, (c) reduced potential for acquiring a source of food for consumption in family and community settings, and (d) constrained fishing-specific recreational experiences on the ocean.

Because **Alternative 2** would attend to SEDAR 80 recommendations to update existing reference points for managing the triggerfish stock complex by setting the ACL equal to the ABC recommended by the SSC, it minimizes the potential for diminished long-term sustainability of the Triggerfish stock complex, and the potential for associated deleterious social impacts postulated to result from the no action **Alternative 1**. Because **Alternative 2** also provides for the greatest allowable harvest of the species relative to **Alternatives 3** and **4**, this option is least likely to generate constraints on triggerfish-specific fishing activities and opportunities, and the potential for related negative impacts to participating persons and communities in the near-term. However, inasmuch as minimized management constraints bear some potential for generating more deleterious effects on the Triggerfish stock complex over time than do the relatively more conservative **Alternative 3 (Preliminary Preferred)** and **Alternative 4**, **Alternative 2** also bears the greatest potential (other than the no action alternative) for generating negative fishery-specific social effects in the long-term**.**

In its incorporation of a 5% management uncertainty buffer, **Alternative 3** (**Preliminary Preferred**) strikes a balance between the fishing constraints that would be imposed through the relatively more conservative **Alternative 4** and its 10% buffer, and the relatively less conservative constraints on fishing activities and opportunities that would result through

implementation of **Alternative 2** and its lack of such buffer. Thus, while **Alternative 4** bears relatively greater potential for conserving the stocks in question over the long-term, it is accompanied by relatively greater potential for associated fishery-specific social impacts over that timeframe. As such, **Alternative 3** (**Preliminary Preferred**) bears the greatest potential of the four specified alternatives to at once establish management measures that would heighten the potential for sustainability of the Triggerfish stock complex over time while minimizing the potential for deleterious near- and long-term social impacts among persons and communities presently and potentially involved in the queen triggerfish fishery around Puerto Rico.

4.1.5 Effects on the Administrative Environment

Updating management reference points including the OFLs, ABCs, and ACLs does not typically result in substantial effects on the administrative environment. **Alternative 1** is not expected to impact the administrative environment because it would not change the current management reference points. **Alternative 2**, **Alternative 3 (Preliminary Preferred),** and **Alternative 4** would result in a short-term increased burden on the administrative environment to specify new OFLs, ABCs, and ACLs, and the required rulemaking to implement this management change. Once these changes to catch levels are implemented, the type of regulations needed to manage the fisheries that target species in the Triggerfish stock complex would remain unchanged, regardless of the harvest levels set. Some additional administrative burden is anticipated under **Alternative 2, Alternative 3 (Preliminary Preferred),** and **Alternative 4** as they would require additional outreach efforts to notify stakeholders of the changes to harvest levels.

4.1.6 Cumulative Effects Analysis

While this environmental assessment (EA) is being prepared using the 2020 Council on Environmental Quality National Environmental Policy Act Regulations, the cumulative effects discussed in this section meet the two-part standard for "reasonable foreseeability" and "reasonably close causal connection" required by the new definition of effects or impacts. Below is the five-step cumulative effects analysis that identifies criteria that must be considered in an EA.

1. ***The area in which the effects of the proposed action will occur*** – The affected area of this proposed action encompasses the state and federal waters of the U.S. Caribbean, specifically Puerto Rico, and includes the communities of Puerto Rico that fish for species in the Triggerfish stock complex. For more information about the area in which the effects of this proposed action will occur, please see Chapter 3, Affected Environment, which describes these resources as well as other relevant features of the human environment.

2. ***The impacts that are expected in that area from the proposed action*** – The proposed action would update reference points for the Triggerfish stock complex managed under the Puerto Rico

FMP based on SEDAR 80. The environmental consequences of the proposed actions are analyzed in Sections 4.1 - 4.5.

Generally a decrease in harvest levels from the status quo (as proposed in **Alternatives 3 (Preliminary Preferred)** and **4**) should provide benefits to the physical environment through fewer gear-bottom interactions. Conversely, an increase in the ACL (proposed in Alternative 2) could generate additional gear-bottom interactions, assuming increased harvest levels.

Setting reference points based on best scientific information available (i.e., SEDAR 80) would be expected to provide increased benefits to the biological/ecological environment for the Triggerfish stock complex through the increased conservation of the stock (Section 4.1.2). Long-term economic and social benefits could also be expected, because managing based on best scientific information available better protects against the risk of overfishing and is more likely to provide for long-term use of the resource. Short-term negative economic and social effects could occur in Puerto Rico (Sections 4.1.3 and 4.1.4), where the catch levels are decreasing, but those effects would be mitigated by the fishermen's ability to shift fishing activities to other species (a higher probability in multi-species fisheries) or to state waters. Short-term positive economic and social effects would be expected if catch levels increase, as proposed by Alternative 2. Modifying management reference points is not expected to substantially affect the administrative environment, either adversely or beneficially (Section 4.1.5) because once the changes are implemented, the type of regulations needed to manage the fisheries that target triggerfish species would remain unchanged.

3. ***Other past, present and reasonably foreseeable future actions that have or are expected to have impacts in the area*** – Listed are actions under development in the U.S. Caribbean that would be expected to have impacts associated with them.

Other fishery related actions – The Puerto Rico, St. Croix, and St. Thomas/St. John FMPs, implemented in 2022, reorganized management measures from the U.S. Caribbean-wide level to each island management area. The Puerto Rico FMP specified ACLs for the Triggerfish stock complex and these are monitored annually by comparing them to available landings,[15] and specified accountability measures (AMs) for when those ACLs are exceeded. The cumulative effects analysis (CEA) for the Island-based FMPs found that the overall impacts of the actions included in the Island-based FMPs would be minimal.

Amendment 1 to the Puerto Rico FMP, implemented in 2023, prohibits the use of buoy gear for recreational fishermen and modifies the definition of buoy gear for commercial harvest in federal waters. The CEA stated that fishing with buoy gear is a specialized fishing method used by

[15] As recreational landings information is not currently available for Puerto Rico, the commercial ACL for the Triggerfish stock complex is currently the applicable ACL for all fishing for the stock complex.

commercial fishermen who target deep-water reef fish (e.g., snapper and grouper species) and that it is unlikely to be used by recreational fishermen. Amendment 1 imposed fishing limitations to the recreational sector in federal waters. However, no recreational fishing information is available for the U.S. Caribbean at this time and data from previous collection programs was not specified to gear type, so the impact of these combined actions is difficult to determine. Although the modification of the buoy gear definition applies to the commercial harvest of reef fish, including managed triggerfish, triggerfish species are not typically harvested with buoy gear. Thus any cumulative effects from this action and Amendment 1 would be expected to negligible.

Amendment 2 to each FMP (under development) would prohibit the use of trawl gear (bottom and mid-water trawls), trammel nets, and purse seines, restrict the use of gillnets in U.S. Caribbean federal waters, and require that descending devices are available and ready for use when fishing for Council-managed reef fish. Species in the Triggerfish stock complex are not targeted by commercial or recreational fishermen with these gear types, but the modification on the use of these gear types in federal waters could minimize any bycatch of the species that may occur from their use. The requirement for the use of descending devices is expected to be beneficial to the species by reducing fishing mortality of discards.

The Council, in partnership with NMFS and other regional constituencies, is in the process of moving towards implementation of ecosystem-based fishery management (EBFM) in the U.S. Caribbean. EBFM enables a more holistic approach to decision-making by considering trade-offs among fisheries, aquaculture, protected species, biodiversity, habitats, and the human community, within the context of climate, habitat, ecological, and other environmental change.

Non-fishery related actions – Actions affecting the U.S. Caribbean fisheries, including effects of global climate change, were included in the CEAs for the Puerto Rico FMP and Amendments 1 and 2. Other issues affecting human communities (e.g., high fuel costs, increased seafood imports, restricted access to fishing grounds, regional economies) were also considered.

Emerging information sheds light on how global climate change would affect, and is already affecting, fishery resources and the habitats upon which they depend. Impacts commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. In the U.S. Caribbean region, major climate-induced concerns include: (1) threats to coral reef ecosystems – coral bleaching, disease, and ocean acidification; (2) threats to habitats from sea level rise – loss of essential fish habitat; (3) climate-induced changes to species phenology and distribution, (4) changes in resource composition in fishing areas, (5) rise in temperature including ocean temperatures and their relationship to more severe and frequent storms, (6) droughts, and (7) effects on environmental justice. Climate change may impact reef fish stocks, including triggerfish species, (see Section 3.2.1.4), but the level of impacts cannot be

quantified at this time, nor is the time frame known in which these impacts would occur. The proposed action is not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing, as this action would not be expected to change how the fishery is prosecuted.

U.S. Caribbean fisheries experienced broad declines in both effort and harvest as a result of the 2017 hurricanes and the COVID-19 public health crisis. Global protective measures (e.g., restaurant closures, social distancing protocols) instituted in March 2020 contributed to an almost-immediate impact on commercial, recreational, and subsistence fishermen.

4. ***The impacts or expected impacts from these other actions*** – Cumulative effects from managing fishery resources in the U.S. Caribbean, including triggerfish species, have been analyzed in other actions, listed in part three of this section. They include detailed analysis of the Puerto Rico fishery, effects on non-targeted and protected species, and habitats. The effects of this action would be expected to be positive in the long-term, as they ultimately act to maintain the Triggerfish stock complex at a level that would allow the maximum benefits in yield and increased fishing opportunities to be achieved. Some short-term minor negative impacts on the social and economic environments could occur due to the changes in ACLs, and if AM-based closures related to those revised ACLs occur in the future. However, these effects would likely be reduced, compared to taking no action, as the stocks would be managed based on the best scientific information available.

5. ***The overall impact that can be expected if the individual impacts are allowed to accumulate*** – Cumulative effects resulting from the revision of management reference points, in combination with other past, present, and reasonably foreseeable future actions, would be expected to be minimal. Some minor short-term negative effects to the social and economic environments would result from a decrease in ACLs and any increase in associated AMs that are triggered and applied, although long-term positive effects would be expected through the increased conservation and continued access to the species in the Triggerfish stock complex.

No significant overall impacts to the biological/ecological environment, to protected species occurring within that environment, to the habitats constituting and supporting that environment, or to the dependent socio-economic environment would be expected from the cumulative past, present, or reasonably foreseeable future actions as it would not be expected to significantly affect current fishing practices (i.e., U.S. Caribbean fisheries would continue to target multiple species using multiple gear types). Similarly, no significant cumulative effects would be expected to result from reasonably foreseeable future actions that may be taken, by other federal or non-federal agencies in combination with this action.

6. Summary – The proposed action is not expected to have significant effects to the physical, biological/ecological, economic, social, or administrative environments. Any effects of the proposed action, when combined with other past actions, present actions, and reasonably foreseeable future actions are not expected to be significant. The effects of the proposed action are, and will continue to be, monitored through collection of data by NMFS, individual state programs, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations.

Chapter 5. Regulatory Impact Review (Under Development)

Chapter 6. Regulatory Flexibility Act Analysis (Draft)

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 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 effects of various alternatives contained in the regulatory action and to ensure the agency considers alternatives that minimize the expected economic effects on small entities while meeting the goals and objectives of the applicable statutes (e.g., the Magnuson-Stevens Fishery Conservation and Management Act [Magnuson-Stevens Act]).

The RFA requires agencies to conduct at the least a threshold analysis to determine if there would be a significant economic impact on a substantial number of small entities. If the threshold analysis concludes there would not be a significant impact on a substantial number of small entities, the threshold analysis is sufficient. However, if the threshold analysis comes to a different conclusion, then an initial regulatory flexibility analysis (IRFA) is required. The following threshold analysis concludes there would not be a significant economic impact on a substantial number of small entities.

6.2 Statement of the need for, objectives of, and legal basis for the rule

The purpose of this proposed rule is to update management reference points for the Triggerfish stock complex by incorporating information from SEDAR 80, which is considered to be the best scientific information for the Triggerfish stock complex.[16,17] More information about the need for and objectives of these actions can be found in Chapter 1 of this document. The Magnuson-Stevens Act provides the legal basis for this proposed rule.

[16] The assessment was released in July 2022. See https://sedarweb.org/documents/sedar-80-us-caribbean-queen-triggerfish-puerto-rico-final-stock-assessment-report-revised-27-july-2022/.

[17] In the Puerto Rico FMP, queen triggerfish is managed in the Triggerfish stock complex with ocean and gray triggerfish and is the indicator stock (i.e., management measures and status determination criteria and management reference points are based on landings of queen triggerfish only, but apply to the entire complex).

6.3 Identification of any federal regulations that may overlap, duplicate or contradict with the proposed rule.

No federal regulations have been identified that may overlap, duplicate or contradict with the proposed rule.

6.4 Description and estimate of the number of small entities to which the proposed action would apply

This proposed action directly impacts recreational fishers (anglers) and commercial fishing businesses. For-hire fishing businesses sell services to anglers. The proposed changes to the total annual catch limit (ACL) and corresponding recreational ACL for queen triggerfish in Puerto Rico would not directly alter the services sold by for-hire fishing businesses. Any change in demand for these fishing services, and associated economic effects, as a result of this action would be a consequence of a change in anglers' behavior, secondary to any direct effect on anglers. Therefore, the impact on for-hire fishing businesses would be an indirect effect of the proposed action.

Recreational Fishers (Anglers)

The proposed action would directly apply to recreational fishers (anglers) that fish in the Puerto Rico exclusive economic zone (EEZ). Recreational fishers are not considered small entities as that term is defined in 5 U.S.C. 601(6), whether fishing from charter (for-hire) fishing, private or leased vessels. Therefore, estimates of the number of anglers directly affected by the proposed action and any impacts on them are neither required nor assessed here.

Commercial Fishing Businesses

The proposed action would directly apply to commercial fishing businesses that operate in the EEZ around Puerto Rico. For RFA purposes, the National Marine Fisheries Service (NMFS) has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (50 CFR 200.2). A business primarily involved in the commercial fishing industry (North American Industrial Classification Code [NAICS] code 11411) 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 its combined annual receipts are no more than $11 million for all of its affiliated operations worldwide. All of the following figures are expressed in 2022 dollars. The most recent 5-year landings data for use with the best available science are from 2015 through 2019. Consequently, estimates of the number of small commercial fishing businesses directly affected and any impacts on them are based on landings from 2015 through 2019.

From 2015 through 2019, an annual average of 785 Puerto Rico commercial fishermen reported combined landings of marine resources of about 2.28 million pounds[18] from all waters with a value of about $11.96 million.[19] The average of these active fishermen reported annual landings of 2,902 pounds and annual revenue from sales of those landings of $15,248. Average median annual landings was 1,431 pounds and average median annual revenue was $6,730 per fisherman. The highest annual revenue among any of the active fishermen during this period was less than $600,000. Because each of these commercial fishermen is assumed to represent a unique commercial fishing business, it is concluded that all commercial fishing businesses in Puerto Rico are small.

Not all commercial fishing businesses harvest queen triggerfish from the EEZ around Puerto Rico. From 2015 through 2019, an annual average of 80 (10.2%) of Puerto Rico's 785 small commercial fishing businesses harvested queen triggerfish from the EEZ and unknown waters (Table 6.1).[20] On average, each of these 80 small businesses landed 108 pounds of queen triggerfish (QT) annually. Hence, an annual average of 80 small commercial fishing businesses in Puerto Rico would be directly affected by the proposed action.

Table 6.1. Annual number of small business with landings of queen triggerfish from PR EEZ and unknown waters, total pounds of QT, total revenue from those QT landings, and average annual pounds of QT and annual revenues from QT per business, 2015 – 2019.

Year	Small Businesses	Pounds QT	Revenue from QT	Average Pounds QT per Business	Average QT Revenue per Business
2015	123	18,299	$40,978	149	$333
2016	90	9,241	$21,147	103	$235
2017	62	4,284	$10,570	69	$170
2018	52	4,312	$8,887	83	$171
2019	74	7,205	$14,906	97	$201
Average	**80**	**8,668**	**$19,298**	**108**	**$241**

Source: NMFS SEFSC Online Southeast Fisheries Reporting System, Caribbean Commercial Landings (CCL) edited landings and Bureau of Economic Analysis (BEA), Gross Domestic Product Deflator (GDP Deflator), issued February 28, 2024.

[18] Reported landings (pounds) are adjusted because of historic underreporting of landings in Puerto Rico. As such, the dollar figures are the product of adjusted pounds and the (dollar) price per pound, and all landings figures are of adjusted pounds.

[19] Preliminary Southeast Fisheries Science Center (SEFSC) Caribbean Commercial Landings (CCL) data of the number of active fishermen from 2020 through 2022 indicate a declining 5-year average. From an average of 785 for the 5-year period from 2015 through 2019 to an average of 675 for the 5-year period from 2018 through 2022.

[20] Landings of queen triggerfish from unknown waters are included, although this may result in overestimations of the number of small businesses directly affected and the economic impacts on these small businesses.

6.5 Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule and their impacts on small businesses

The proposed regulatory action would not impose any new reporting or record-keeping requirements on any of the small businesses that operate in Puerto Rico.

The proposed action would reduce the total ACL for the Triggerfish stock complex in Puerto Rico from 90,552 pounds to 87,220 pounds.[21] It would correspondingly reduce the commercial ACL for the Triggerfish stock complex from 83,099 pounds to 80,041 pounds. The commercial ACL applies to landings from all waters, not just from the EEZ around Puerto Rico. From 2015 through 2019, annual commercial landings of queen triggerfish from all waters ranged from 40,437 pounds to 71,407 pounds (Table 6.2).[22] From those landings, there is no future expectation that any single year or average of multiple years of commercial landings of queen triggerfish from all waters would reach or exceed the current commercial ACL (83,009 pounds) or proposed commercial ACL (80,041 pounds).

Table 6.2. Commercial queen triggerfish landings in Puerto Rico from all waters, 2015 – 2019.

Year	Pounds of Queen Triggerfish
2015	71,407
2016	66,160
2017	40,437
2018	57,089
2019	56,867

NMFS SEFSC Online Southeast Fisheries Reporting System, CCL edited landings and BEA, GDP Deflator, issued February 28, 2024.

Because recreational landings are not available,[23] commercial landings are used to represent total landings (combined commercial and recreational), and those total landings are compared to the total ACL. During the most recent monitoring of landings, total triggerfish landings were at 68% of the total ACL, and landings data indicate that total landings will continue to be below the

[21] As stated previously, queen triggerfish is managed in the Triggerfish stock complex and is the indicator species for the complex. As such, commercial landings of queen triggerfish are compared to the commercial ACL for the Triggerfish stock complex, and all landings of queen triggerfish are compared to the total ACL for the complex.
[22] Note that, on average, about 14% of annual queen triggerfish landings (pounds) derive from queen triggerfish taken from the EEZ or unknown waters.
[23] Recreational landings data are not expected to be available within the next five years, and no date has been established for when they would be available.

current total ACL and proposed total ACL. As such, the proposed action would not affect small businesses' commercial landings of triggerfish in Puerto Rico.[24]

6.6 Conclusion

As explained above, the proposed action is expected to have no economic impact on small businesses in Puerto Rico. Therefore, the proposed action would not have a significant economic impact on a substantial number of small businesses.

[24] If NMFS estimates that commercial landings have exceeded the commercial ACL and combined commercial and recreational landings have exceeded the total ACL, the commercial fishing season is reduced by the amount necessary to prevent commercial landings from exceeding the commercial ACL, unless NMFS determines a fishing season reduction is not necessary based on the best scientific information available.

Chapter 7. List of Preparers

Table 7.1. Interdisciplinary Planning Team Members

Name	Agency	Title
María del Mar López-Mercer	NMFS/SFD	IPT Co-Lead / Fishery Biologist/Author
Sarah Stephenson	NMFS/SFD	IPT Co-Lead / Fishery Biologist/Author
Graciela García-Moliner	CFMC	IPT Co-Lead / Habitat Specialist
Liajay Rivera	CFMC	Ecosystem-based Fishery Management Specialist
John McGovern	NMFS/SFD	SFD Assistant Regional Administrator
Denise Johnson	NMFS/SFD	Economist/Author
Edward Glazier	NMFS/SFD	Social Scientist/Author
Walter Keithly	CMFC	Economist/Author
Katharine Zamboni	NOAA/GC	Attorney
Adam Bailey	NMFS/SFD	Technical Writer
Jashira Torres	NMFS/PRD	Fishery Biologist
Michael Larkin	NMFS/SFD	Data Analyst
Adyan Rios	NMFS/SEFSC	Research Fishery Biologist
Brent Stoffle	NMFS/SEFSC	Social Scientist
Noah Silverman	NMFS/SERO	NEPA Regional Coordinator

CFMC = Caribbean Fishery Management Council, GC = General Counsel,
HCD = Habitat Conservation Division, NEPA = National Environmental Policy Act, NMFS = National Marine Fisheries Service, NOAA = National Oceanic and Atmospheric Administration, OLE= Office of Law Enforcement, PRD = Protected Resources Division,
SERO = Southeast Regional Office, SER = Southeast Region,
SFD = Sustainable Fisheries Division, SEFSC = Southeast Fisheries Science Center

Chapter 8. List of Agencies, Organizations, and Persons Consulted

Department of Commerce Office of General Counsel

National Marine Fisheries Service Office of General Counsel

National Marine Fisheries Service Office of General Counsel Southeast Region

National Marine Fisheries Service Southeast Regional Office

National Marine Fisheries Service Southeast Fisheries Science Center

National Marine Fisheries Service Silver Spring Office

National Marine Fisheries Service Office of Law Enforcement Southeast Division

United States Coast Guard

United States Department of the Interior

U.S. Virgin Islands Department of Planning and Natural Resources

Puerto Rico Department of Natural and Environmental Resources

Puerto Rico Junta de Calidad Ambiental (Puerto Rico Environmental Quality Board)

Chapter 9. References

Agar, J., Shivlani, M., and D. Solís. 2017. The Commercial Trap Fishery in the Commonwealth of Puerto Rico: an Economic, Social, and Technological Profile. North American Journal of Fisheries Management, 37: 778-788. https://doi.org/10.1080/02755947.2017.1317678

Agar, J. J., M. Shivlani, and D. Matos-Caraballo. 2020. The aftermath of Hurricane María on Puerto Rican small-scale fisheries. *Coastal Management*. Volume 48, Number 5, pp. 378-397. Available here.

Agar, J., Stoffle, B., Shivlani, M., Matos-Caraballo, D., Mastitski, A., and F. Martin. 2022. One-year COVID-19 Pandemic Impacts on U.S. Caribbean Small-Scale Fisheries with a note on the Puerto Rican earthquake swarm of 2020 and 2021. NOAA Tech. Memo. NMFS-759, 34 p. Available here.

Appeldoorn, R.S., Sanders, I.M., and L. Färber. 2015. A 50-Year Reconstruction of Fisheries Catch in Puerto Rico. University of British Columbia, Working Paper series #2015-44, 16pp.

Bryan, D. R., Feeley, M. W., Nemet, R.S., Pollock, C., and J.S. Ault. 2019. Home range and spawning migration patterns of queen triggerfish Blistes vetula in St. Croix, US Virgin Islands. Marine Ecology Progress Series, Volume 616, pp. 123-139. May 9. Available here.

CFMC 2019. Comprehensive Fishery Management Plan for the Puerto Rico Exclusive Economic Zone. Including Environmental Assessment, Regulatory Impact Review, and Fishery Impact Statement. Final Version. Available here.

CFMC 2022. Generic Amendment 1 to the Fishery Management Plans for Puerto Rico, St. Thomas and St. John, and St. Croix: Modification to the Buoy Gear Definition and Use Including Environmental Assessment, Fishery Impact Statement, Regulatory Impact Review, and Regulatory Flexibility Act Analysis. October 2022. San Juan. Available here.

Garcia-Quijano, C.G. 2009. Managing complexity: ecological knowledge and success in Puerto Rican small-scale fisheries. Human Organization. Volume 68, Number 1, pp. 1-17. Available here.

GMFMC. 2021. Modifications to Gray Triggerfish Catch Levels: Final Framework Action to the Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico, Including Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Analysis. Available here.

Gomez-Andujar N.X., Gerke, D., Conway, F., and J.R. Watson. 2022. Social cohesion and self-governance arrangements among small-scale fisheries in Puerto Rico. Frontiers of Marine Science, 9:966309. Available here.

Grove, L.J.W., Blondeau, J., and J.S. Ault. 2022. Fishery-Independent Reef Fish Visual Survey Population Density and Length Composition for Queen Triggerfish in the U.S. Caribbean. SEDAR80-WP-08. SEDAR, North Charleston, SC. 32 pp.

Jacob, S., Weeks, P., Blount, B., and M. Jepson. 2013. Development and evaluation of social indicators of vulnerability and resiliency for fishing communities in the Gulf of Mexico. Marine Policy 37:86-95. Available here.

Jepson, M. and L. L. Colburn. 2013. Development of social indicators of fishing community vulnerability and resilience in the U.S. Southeast and Northeast Regions. U.S. Dept. of Commerce, NOAA Technical Memorandum NMFS-F/SPO-129, 64 p. Available here.

Matos-Caraballo, D., and J. Agar. 2011. Census of Active Commercial Fishermen in Puerto Rico: 2008. Department of Natural and Environmental Resources, Final Report to the National Marine Fisheries Service, NOAA. 39 pp.

Nuttall, M.A. and V.M. Matter. 2021. General Recreational Survey Data for Queen Triggerfish in Puerto Rico. SEDAR80-WP-01. SEDAR, North Charleston, SC. 24 pp.

Puerto Rico Department of Natural and Environmental Resources. 2024. Data from the PRDNER Permits Secretariat. San Juan.

Rivera Hernández, J.M., Peña Alvarado, N., Correa Vélez, K., Nemeth, R., Appeldoorn, R. and V. Shervette. 2019. Queen Triggerfish Reproductive Biology in U.S. Caribbean Waters. Trans Am Fish Soc, 148: 134-147. https://doi.org/10.1002/tafs.10124

SEDAR. 2022. SEDAR 80 – US Caribbean Queen Triggerfish – Puerto Rico Final Stock Assessment Report. SEDAR, North Charleston, SC. Available online at: http://sedarweb.org/sedar-80

Shivlani, M. 2021. A commercial fishery census of Puerto Rico to develop a new baseline on fishery participation, markets, and infrastructure in the small-scale fishery sector. Grant Number: NA18NMF4270197

SSC Caribbean. 2022. Report to the CFMC. Caribbean Fishery Management Council 180th Regular Meeting, December 6-7, 2022. San Juan, Puerto Rico

https://caribbeanfmc.com/Briefing_Books/180th_Meeting/SSC_Rept_to_CFMC_December_2022.pdf

U.S. Census Bureau. 2023. Table S1701 – Poverty Status in the Past 12 Months. Puerto Rico. Available here.

U.S. Census Bureau. 2022. 2020 Island Areas Censuses: Puerto Rico.

U.S. Census Bureau 2021. Census Population and Housing Unit Counts for Puerto Rico.

U.S. Census Bureau. 2020. Puerto Rico: 2020 Census. Available here.

Valle-Esquivel, M., Shivlani, M., Matos-Caraballo, D., and D. J. Die. 2011. Coastal fisheries of Puerto Rico, pp. 285–313 in Coastal Fisheries of Latin America and the Caribbean. S. Salas, R. Chuenpagdee, A. Charles, and J. C. Seijo, editors. FAO Fisheries and Aquaculture Technical Paper. No. 544. Rome. Available here.

Appendix A. Accountability Measures (AM) Process for Reef Fish under the Puerto Rico FMP

Accountability Measures 50 CFR 622.440(a)

(4) ***General applicability and monitoring of AMs.*** At or near the beginning the fishing year, landings for each stock, stock complex, or indicator stock will be evaluated relative to the ACL based on a moving multi-year average of landings, as described in the FMP. When landings for one sector are not available for comparison to that sector's ACL, the ACL for the sector with available landings is the ACL for the stock or stock complex and the AM specified in paragraph (a)(7) of this section applies. Any fishing season reduction required under paragraph (a) of this section will be applied starting from September 30 and moving earlier toward the beginning of the fishing year. If the length of the required fishing season reduction exceeds the time period of January 1 through September 30, any additional fishing season reduction will be applied starting from October 1 and moving later toward the end of the fishing year.

(5) ***Commercial AMs.*** If NMFS estimates that commercial landings for a stock, stock complex, or indicator stock have exceeded the applicable commercial ACL specified in paragraph (a)(1) of this section for the stock or stock complex, and the combined commercial and recreational landings for the stock, stock complex, or indicator stock have exceeded the applicable combined commercial and recreational sector ACL (total ACL) specified in paragraph (a)(3) of this section for that stock or stock complex, the Assistant Administrator for NOAA Fisheries (AA) will file a notification with the Office of the Federal Register to reduce the length of the commercial fishing season for the stock or stock complex within that fishing year by the amount necessary to prevent commercial landings from exceeding the commercial ACL for the stock or stock complex, unless NMFS determines that a fishing season reduction is not necessary based on the best scientific information available. If NMFS determines that either the commercial ACL or total ACL for the stock or stock complex was exceeded because data collection or monitoring improved rather than because landings increased, NMFS will not reduce the length of the commercial fishing season for the stock or stock complex.

(6) ***Recreational AMs.*** If NMFS estimates that recreational landings for a stock, stock complex, or indicator stock have exceeded the applicable recreational ACL specified in paragraph (a)(2) of this section for the stock or stock complex, and the combined commercial and recreational landings for the stock, stock complex, or indicator stock have exceeded the applicable combined commercial and recreational ACL (total ACL) specified in paragraph (a)(3) of this section for that stock or stock complex, the AA will file a notification with the Office of the Federal Register to reduce the length of the recreational fishing season for the

stock or stock complex within that fishing year by the amount necessary to prevent recreational landings from exceeding the recreational ACL for the stock or stock complex, unless NMFS determines that a fishing season reduction is not necessary based on the best scientific information available. If NMFS determines that either the recreational ACL or total ACL for the stock or stock complex was exceeded because data collection or monitoring improved rather than because landings increased, NMFS will not reduce the length of the recreational fishing season for the stock or stock complex.

(7) ***AM when only one sector's landings are available.*** When landings for one sector are not available for comparison to that sector's ACL, the ACL for the sector with available landings in paragraph (a) of this section is the applicable ACL for the stock or stock complex. If NMFS estimates that available landings for the stock, stock complex, or indicator stock, have exceeded the applicable ACL for the stock or stock complex, the AA will file a notification with the Office of the Federal Register to reduce the length of the fishing season for the stock or stock complex within that fishing year by the amount necessary to prevent landings from exceeding the ACL, unless NMFS determines that a fishing season reduction is not necessary based on the best scientific information available. If NMFS determines that the ACL was exceeded because data collection or monitoring improved rather than because landings increased, NMFS will not reduce the length of the fishing season for the stock or stock complex.

Appendix B. 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 Procedure Act (APA)

All federal rulemaking is governed under the provisions of the 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, which can be waived in certain instances.

The proposed rule associated with this Framework Action will include a request for public comment, and if approved, upon publication of the final rule, there will most likely be a 30-day wait period before the regulations are effective in compliance with the APA.

Coastal Zone Management Act (CZMA)

The 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 CFR 930.41(a).

Upon submission to the Secretary of Commerce, NMFS will determine if this Framework Action is consistent with the Coastal Zone Management programs of Puerto Rico and the U.S. Virgin Islands (USVI), to the maximum extent possible. Their determination will then be submitted to the responsible agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs.

Information Quality Act (IQA)

The IQA (Public Law 106-443) effective October 1, 2002, requires the government 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 IQA 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 disseminate 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 (FMP) and amendments and the use of best available information is the second national standard under the Magnuson-Stevens Act. To be consistent with the IQA, FMPs and amendments must be based on the best information available. They should also properly reference all supporting materials and data, and be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data will also undergo quality control prior to being used by the agency and a pre-dissemination review.

Endangered Species Act (ESA)

The ESA of 1973 (16 U.S.C. Section 1531 et seq.) requires that federal agencies must ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or destroy or adversely modify the habitat designated as critical habitat (habitat essential to the species' conservation). 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 critical habitat. Consultations are necessary to determine the potential impacts of the proposed action. They conclude 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 designated critical habitat.

NMFS completed a biological opinion on September 21, 2020, evaluating the impacts of the Puerto Rico, St. Croix, and St. Thomas/St. John fisheries on ESA-listed species. Refer to Section 3.2.3 for additional information.

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 the Puerto Rico FMP will have no adverse impact on marine mammals. The primary gear types used in the Puerto Rico fisheries are classified in the 2024 List of Fisheries as a Category III fishery (89 FR 12257), which is unchanged from the 2023 List of Fisheries as a Category III fishery (88 FR 16899). This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to one percent of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock, while allowing that stock to reach or maintain its optimum sustainable population. The action is not expected to alter existing fishing practices in such a way as to alter the interactions with marine mammals.

Paperwork Reduction Act (PRA)

The 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.

Essential Fish Habitat (EFH)

The Magnuson-Stevens Act includes EFH requirements, and as such, each existing and new FMPs must describe and identify EFH for the fishery, minimize to the extent practicable adverse effects on that EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of that EFH.

The areas affected by the proposed action have been identified as EFH for managed species, as described under the Puerto Rico FMP. As specified in the Magnuson-Stevens Act, EFH consultation is required for federal actions, which may adversely affect EFH. Any required consultation requirements will be completed prior to implementation of any new management measures.

National Environmental Policy Act (NEPA)

The 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.

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.

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. Federal agency responsibilities under this Executive Order include conducting their programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons from participation in, denying persons the benefit of, or subjecting persons to discrimination under, such, programs policies, and activities, because of their race, color, or national origin. Furthermore, each federal agency responsibility set forth under this Executive Order shall apply equally to Native American programs. Environmental justice considerations are discussed in Chapter 3.

The action in this Framework Action is not expected to negatively impact minority or low-income populations.

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 Puerto Rico FMP designated habitats of particular concern in Puerto Rico for managed corals and included management measures to minimize, to the extent practicable, adverse effects caused by fishing on those habitats. There are no implications to coral reefs by the actions proposed in this framework.

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 Framework Action.

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.

This action will not introduce, authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere.

E.O. 13158: Marine Protected Areas (MPA)

Executive Order 13158 (May 26, 2000) requires federal agencies to consider whether their proposed action(s) will affect any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural or cultural resource within the protected area.

This action will not affect any MPAs in federal waters off Puerto Rico.