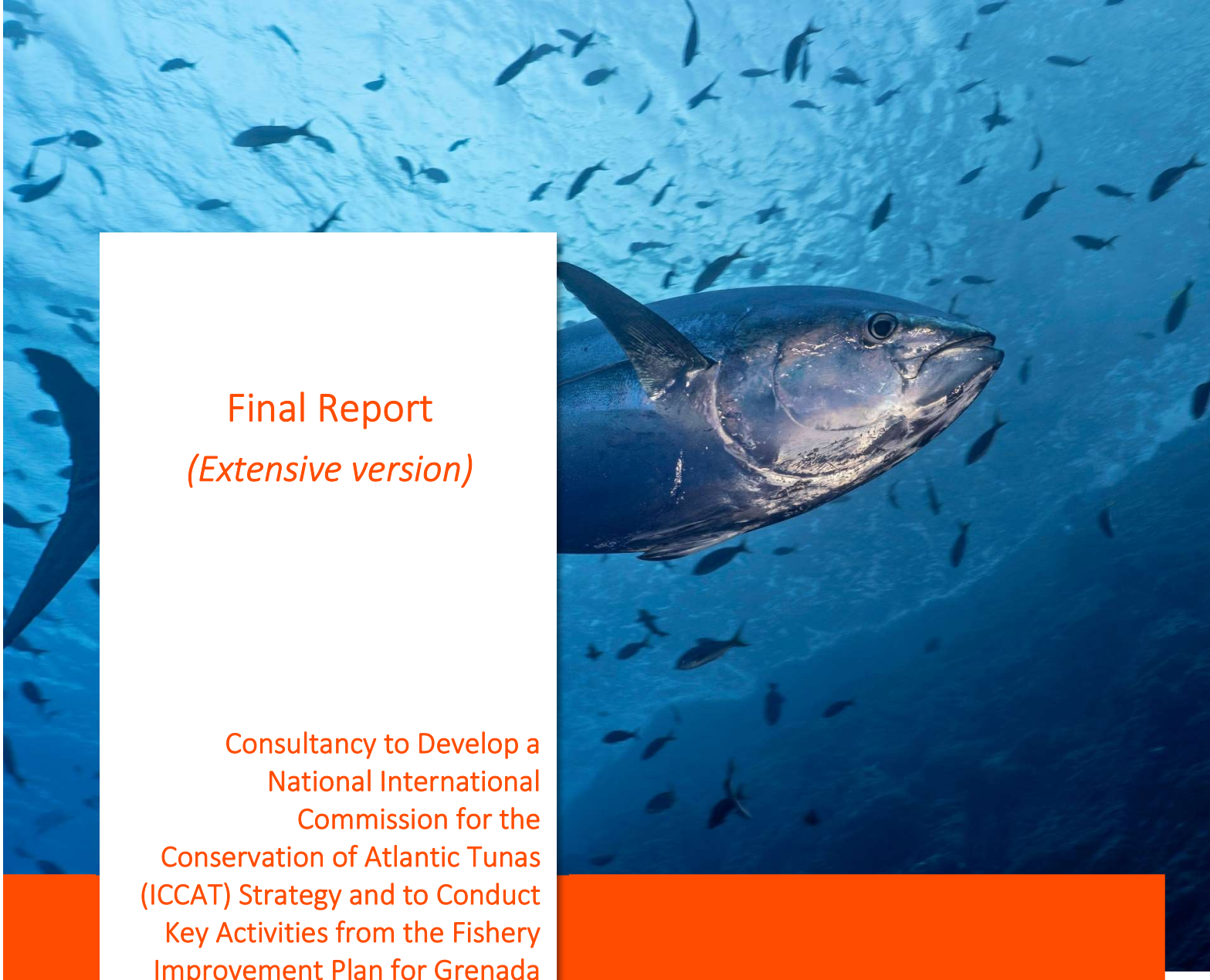


Final Report

(Extensive version)

Consultancy to Develop a National International Commission for the Conservation of Atlantic Tunas (ICCAT) Strategy and to Conduct Key Activities from the Fishery Improvement Plan for Grenada

CH | Business Consulting.

COMPETE CARIBBEAN

IDB Inter-American Development Bank

CONTENTS

1 ICCAT COMPLIANCE DOCUMENTS..... 6
1.1 CHAPTER 1: GRENADA'S TRANSSHIPMENT POLICY..... 7
1.1.1 Policy title..... 7
1.1.2 Background and rationale..... 7
1.1.3 Purpose and objectives..... 7
1.1.3.1 Purpose..... 7
1.1.3.2 Objectives..... 7
1.1.4 Policy statement..... 8
1.1.5 Definitions..... 8
1.1.6 Principles..... 8
1.1.7 Scope and application..... 9
1.1.7.1 Legislation framework..... 9
1.1.7.2 Governance framework..... 9
1.1.7.3 Input resources..... 10
1.1.8 Monitoring and evaluation..... 11
1.1.8.1 Policy Statement..... 11
1.1.8.2 Scope of Monitoring..... 11
1.1.8.3 Timelines of Monitoring..... 11
1.1.8.4 Evaluation and Reviews..... 11
1.1.9 Reporting..... 11
1.1.10 Roles and responsibilities..... 12
1.1.10.1 Governance and Management..... 12
1.1.10.2 General Advocacy and Education..... 12
1.1.10.3 Implementation..... 12
1.1.10.4 Reporting..... 12
1.1.11 Data and information management..... 13
1.1.12 Management of the policy..... 13
1.1.13 Chapter Bibliography..... 13
1.1.14 Chapter annexes – Monitoring and reporting forms recommended by ICCAT and FAO..... 14
1.1.14.1 Annex 1 - Data fields for the reporting of port inspections, formally adopted by ICCAT in 2023. 14
1.1.14.2 Annex 2 - Information to be included in a landing declaration, Unique Identifier, proposed by FAO..... 15
1.1.14.3 Annex 3 - Transshipment declaration form, with amendment adopted by ICCAT in 2022. 17
1.1.14.4 Annex 4 – Information to be included in a transshipment declaration Unique identifier, proposed by FAO..... 18
1.2 CHAPTER 2: GRENADA'S TUNA FISHERY MANAGEMENT AND DEVELOPMENT PLAN: 2025-2030 21
1.2.1 Introduction..... 23
1.2.1.1 Description of Tuna Fishery..... 23
1.2.1.2 State of tuna and tuna-like stocks..... 24
1.2.1.3 Purpose..... 26
1.2.1.4 Scope..... 26
1.2.2 Layout of the plan..... 27
1.2.3 Legal, policy & institutional framework..... 27
1.2.4 Management and development objectives..... 29
1.2.4.1 Long-term objectives of the Tuna Fishery Plan..... 29

1.2.4.2 Specific objectives relating to anchored fad (afad) fishery 29
1.2.5 Management measures 30
1.2.5.1 General measures 30
1.2.5.2 Species-specific management measures 31
1.2.5.3 Capacity management & registration and licensing 33
1.2.5.4 Monitoring control and surveillance (MCS) 34
1.2.5.5 Fish aggregating devices 35
1.2.5.6 Industry, commerce, and corporate social responsibility 35
1.2.6 Development measures 35
1.2.6.1 Development of management system 35
1.2.6.2 Industry, commerce, and corporate social responsibility 37
1.2.7 Chapter bibliography 38
1.2.8 Chapter Annexes 40
1.2.8.1 Annex 1 - Fisher and vessel registration and licence forms and certificates 40
1.2.8.2 Annex 2 - Daily fish landing log 45
1.2.8.3 Annex 3 - Observer Plan 46
1.2.8.4 Annex 4 - Vessel Monitoring System (VMS) Plan 48
2 NATIONAL ICCAT STRATEGY FOR GRENADA WITH ASSESSMENTS 50
EXECUTIVE SUMMARY 51
2.1 ICCAT NATIONAL STRATEGY 53
2.1.1 Introduction 53
2.1.1.1 International cooperation and the role of the International Commission for Conservation of Atlantic Tunas (ICCAT) 53
2.1.1.2 Grenada's tuna fishery – national context and importance, ongoing development, investment, and success expectations 53
2.1.1.3 Grenada's potential power and impact as a stakeholder in Atlantic tuna fisheries 55
2.1.2 Mission 55
2.1.2.1 What the strategy achieves 55
2.1.2.2 Who the strategy serves 55
2.1.2.3 What drives the strategy to make it effective 56
2.1.2.4 Mission statement 56
2.1.3 Vision 56
2.1.3.1 Desired impact of strategy (what impact, for whom, and why) 56
2.1.3.2 What to change 56
2.1.3.3 How to make the change 57
2.1.3.4 Vision statement 57
2.1.4 Core values, principles and guidelines 58
2.1.5 Impacts, issues and root causes 58
2.1.6 Action/ execution plan 59
2.1.6.1 Strategic Priority 1 – Effective management, usage, and accessibility of tuna fishery evidence base 59
2.1.6.2 Strategic Priority 2 – Effective, equitable stakeholder participation 65
2.1.6.3 Strategic Priority 3 – Active, adaptive national tuna fishery policy/management cycle 68
2.1.6.4 Strategic Priority 4 – National holistic approach for policy coherence 72
2.1.7 Roles and responsibilities 77
2.1.8 Financing options 78
2.1.9 Chapter BIBLIOGRAPHY 79
2.2 GRENADA LONGLINE BAIT USAGE ASSESSMENT 81

2.2.1 Grenada bait usage 81
2.2.2 Regional caribbean bait usage 83
2.2.3 Other caribbean regional sources of mortality on bait species 83
2.2.4 Assessment of bait species 84
2.2.4.1 Flyingfish 84
2.2.4.2 Bigeye Scad 86
2.2.4.3 Threadfin Herring 86
2.2.5 On harvest control rules and management strategy evaluations for bait species 86
2.2.6 Chapter references 87
2.2.7 Technical Appendix 87
2.3 ASSESSMENT OF POTENTIAL RISKS OF FISHING PRACTICES AND IDENTIFICATION OF BARRIERS TO IMPLEMENTING CHANGE 89
2.3.1 Introduction 89
2.3.2 ICCAT and Grenada 89
2.3.3 Grenada tuna pelagic longline, troll and dropline fisheries 89
2.3.4 Risks to target and non-target species in grenada longline, troll and dropline fisheries 90
2.3.4.1 Bycatch Assessment of Relative Risks 91
2.3.5 Conclusions and recommendations on opportunities for improved bycatch mitigation 93
2.3.6 Chapter references 94
2.3.7 Appendices 95
2.3.7.1 Appendix 1. Grenada Tuna Catches and Stock Status 95
2.3.7.2 Appendix 2. Role of harvest control rules in iccat and grenada 103

ACRONYMS AND ABBREVIATIONS

aFAD	Anchored Fish Aggregating Device
ALB	Albacore
API	Application Programming Interface
BET	Bigeye Tuna
BUM	Blue Marlin
CA	Convention Area
CARICOM	Caribbean Community
CC4FISH	Climate Change Adaptation in the Eastern Caribbean Fisheries Sector Project
CCPF	Compete Caribbean Partnership Facility
CDB	Caribbean Development Bank
CFRAMP	CARICOM Fisheries Resource Assessment and Management Programme
CLME	Caribbean Large Marine Ecosystem
CRFM	Caribbean Regional Fisheries Mechanism
ECROP	Eastern Caribbean Regional Ocean Policy
FAC	Fisheries Advisory Committee
CPC	Contracting Party and Cooperating Non-Contracting Party, Entity or Fishing Entity in ICCAT
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organization of the UN
FIP	Fishery Improvement Plan
GNExTT	Grenada National Export Traceability and Technology, Inc.
HCR	Harvest Control Rule
ICCAT	International Commission for Conservation of Atlantic Tunas
IDB	Inter-American Development Bank
IPNLF	International Pole and Line Foundation
IUU	Illegal, unreported and unregulated
LL	Long Line
LOA	Length Overall
MP	Management Procedure
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation
MSY	Maximum Sustainable Yield
NOP	National Ocean Policy
NOGC	National Ocean Governance Committee
OECS	Organisation of Eastern Caribbean States
RFMO	Regional Fisheries Management Organisation
PSA	Productivity and Susceptibility Analysis
RBM	Results-Based Management
RFB	Regional Fisheries Body
RFMO	Regional Fisheries Management Organisation
RSS	Regional Security System
SAI	Sailfish
SCRS	Standing Committee on Research and Statistics
SFA	Southern Fishermen's Association
SGU	St. George's University
SIDS	Small Island Developing States
SKJ	Skipjack Tuna
TAC	Total Allowable Catch
UK	United Kingdom
US	United States
WECAFC	Western Central Atlantic Fishery Commission
WG	Working Group
VMS	Vessel Monitoring System
WECAFC	Western Central Atlantic Fishery Commission
WHM	White Marlin
XCD	Eastern Caribbean Dollar
YFT	Yellowfin Tuna

1 ICCAT COMPLIANCE DOCUMENTS

Citation:

CH Business Consulting (2024). *ICCAT Compliance Documents*. Portugal, CH Business Consulting

1.1 CHAPTER 1: GRENADA'S TRANSSHIPMENT POLICY

Susan Singh-Renton

1.1.1 POLICY TITLE

The title of the Policy is Grenada's Transshipment Policy (hereinafter Policy).

1.1.2 BACKGROUND AND RATIONALE

Grenada's oceanic pelagic fishery has steadily grown in its importance since longline technology was introduced with the support of a fisheries training school established in 1979. Oceanic pelagic species comprised 49% of national fish production in 1990, but this amount had increased to 79% of fish production by 2013. During 1980-2000, the government worked to develop a commercial scale of fishing operations, while exploring both local and external markets and their quality assurance needs. These efforts helped to promote a higher level of private sector involvement in the fishing industry. There was also increased support from regional fisheries bodies for improved fisheries governance and management from 2001 onwards.

In 2023, national fish production was estimated to be 6 million lbs (2727 mt), with a value of XCD40 million. Of this, 1.4 million lb (636 mt) of fish were exported, with an estimated value of XCD16 million or 40% of the total fish production value. These data reflect the valuable contribution of the fish export industry to Grenada. Current and future interests of the fisheries sector will require investment by both the public and private sector to strengthen performance in a wide range of areas, including, *inter alia*: national capacity to address incidents of illegal, unreported and unregulated (IUU) fishing; value chain design for improving trade and market opportunities, governance frameworks; fisheries diversification and expansion; climate change; living marine resource conservation and environmental protection; fisherfolk capacity for leadership, business management and making use of modern technologies; safety at sea; and, comprehensive social protection.

Considering the development interests and potential of Grenada's tuna fishery, the Policy provides the necessary foundation for Grenada to adhere to agreed international standards and best practices for the effective management of seafood value chain designs that are still developing and exploring international trade options. The Policy allows Grenada's fishing industry stakeholders to have the flexibility to engage in international fish and fish product transshipment operations, while ensuring that such operations are managed to prevent, deter and eliminate IUU fishing and IUU fishing related activities.

1.1.3 PURPOSE AND OBJECTIVES

1.1.3.1 PURPOSE

The purpose of the Policy is to prevent, deter, and eliminate Illegal, unreported, and unregulated (IUU) fishing and fishing related activities, to prevent IUU fishing products from entering the seafood supply chain, and to prevent support for related illegal activities such as human trafficking, and trafficking in drugs and weapons. The Policy contributes to the purpose and objectives of the National Ocean Policy.

1.1.3.2 OBJECTIVES

1. To enhance Grenada's position as a state of responsible fisheries, supporting sustainable fisheries that are based on fair competition.
2. To comply with agreed international standards for best practices for international transshipment of fish and fish products, as a key component of the national effort to prevent, deter and eliminate IUU fishing, and related transnational organised crime in the global fishing industry.

3. To cooperate with the International Commission for the Conservation of Atlantic Tunas (ICCAT), and other regional fisheries bodies (RFBs) in the fight against IUU fishing and IUU fishing related activities by compliance with ICCAT measures for monitoring, control and enforcement of tuna and other fishery transshipment operations, and with other relevant RFB recommended measures.
4. To implement the Food and Agriculture Organization (FAO) *Voluntary Guidelines for Transshipment*.

1.1.4 POLICY STATEMENT

Grenada adheres to agreed international standards for the management of transshipment of fish and fish products in the fight to prevent, deter, and eliminate IUU fishing, IUU fishing related activities, and other associated illegal activities.

1.1.5 DEFINITIONS

Definitions provided by FAO (2022) and by ICCAT are applicable for the purpose of the Policy. These definitions are adopted and are replicated here for ease of reference.

Donor vessel	Any vessel engaged in a transshipment operation, that transfers any quantity of fish onboard to another vessel.
Fish	All species of living marine resources that have not been previously landed, whether processed or not.
Fishing	searching for, attracting, locating, catching, taking or harvesting fish or any activity that can be reasonably expected to result in the attracting, locating, catching, taking or harvesting of fish
Fishing related activities	Any operation in support of, or in preparation for, fishing, including the landing, packaging, processing, transshipping or transporting of fish that has not been previously landed at a port, as well as the provisioning of personnel, fuel, gear and other supplies at sea.
Fishing vessel	any vessel, ship of another type or boat, used for, equipped to be used for, or intended to be used for, fishing or fishing related activities
Landing	All transfers of any quantity of fish onboard from a vessel, other than transshipment, including transfers of fish to a port facility, transfers of fish from one vessel to another through a port facility or other means of transportation, and transfers of fish from a vessel to a container, truck, train, aircraft, or another means of transportation.
Port	includes offshore terminals and marine areas of the port, and other installations for landing, transshipping, packaging, processing, refuelling or resupplying.
Receiving vessel	Any vessel engaged in a transshipment operation, that receives any quantity of fish from another vessel.
Regional fisheries management organisation or arrangement	An intergovernmental fisheries organisation or arrangement, as appropriate, that has the competence to establish conservation and management measures, including measures concerning transshipment.
Transshipment	The direct transfer of any quantity of fish onboard from one vessel to another vessel regardless of the location of the event, without the fish being recorded as landed
Vessel	Any vessel, ship of another type or boat, or any floating platform used for, or intended to be used for, fishing or fishing related activities, including transshipment of fish.

1.1.6 PRINCIPLES

The Policy adopts the principles of FAO (2022), which are reiterated here for ease of reference.

In order to prevent IUU fishing the regulation, monitoring and control of transshipment should:

(i) be in conformity with the relevant rules of international law;

(ii) ensure that all relevant movement of fish as transshipment and other related activities are sufficiently documented;

(iii) ensure that donor and receiving vessels are appropriately authorized to engage in transshipment operations;

(iv) include transparent reporting procedures to facilitate prevent and post-event verification of authorizations and transshipment data;

(v) ensure a risk-based approach so that measures are prioritized and proportional with identified risks, and are designed to reduce and mitigate those risks effectively;

(vi) require electronic reporting and encourage electronic monitoring, where feasible; and

(vii) ensure that transshipment events are adequately regulated, authorized, monitored, and complemented by port State and coastal State measures or flag State actions related to landing of transshipped fish, and support traceability, where possible.

1.1.7 SCOPE AND APPLICATION

This Policy applies to all fishery transshipment operations involving Grenada particularly as a flag State, and/or a port State. General flag State and port State responsibilities are described in several international fisheries instruments, e.g. UN Law of the Sea, and Port State Measures Agreement. Specific guidelines and measures are followed for the management, monitoring, control and surveillance of fishery transshipment operations, and are aligned, to the extent of national capacity, with the *FAO Voluntary Guidelines for Transshipment*, and relevant, active ICCAT management measures. Where national capacity for application is inadequate, every effort should be made to develop the necessary capacity needed to fulfil the Policy purpose and its objectives.

1.1.7.1 LEGISLATION FRAMEWORK

The Fisheries Act (Act No. 15 of 1986) and amendments (Act No. 25 of 1989 and Act No. 1 of 1999) and subsidiary legislation are currently in place. Application of the Policy and its evolution requires keeping under review the national legislation framework. A review of the national legislation framework is recommended, for which international support is available (see 1.1.7.3). Application of the Policy requires legally supported international cooperation, and therefore warrants a review and evaluation of the need for Grenada to become a party to key international agreements, especially, *The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks*, and *UN FAO Compliance Agreement: The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas*.

1.1.7.2 GOVERNANCE FRAMEWORK

Operating under the direction of the Ministry of Agriculture & Lands, Forestry & Marine Resources, Grenada's Fisheries Division is the competent authority with responsibility for the development and management of fishery resources harvested by Grenada. The mandate and functions of the Fisheries Division are governed by the Fisheries Act (Act No. 15 of 1986), its amendments (Act No. 25 of 1989 and Act No. 1 of 1999) and subsidiary legislation.

A Fisheries Advisory Committee (FAC), which is approved under the Fisheries Act, and which includes members from both the public and private sector, facilitates representation of all fisheries stakeholders' needs and interests, and provides informed advice to the Ministry that is then responsible for taking policy and management decisions. Fisher associations or cooperatives are established in several fishing communities, with capacity to provide the necessary local level of input and support to the governance

process. District Fisheries Extension Offices operate at seven locations throughout Grenada and assist with various management activities, including vessel registration, licensing, inspection, and data collection.

Considering that seafood transshipment operations can take place in a national port, within Grenada's national maritime zone, or by a Grenadian flagged vessel on the High Seas or in a foreign port, the national governance framework is extended to include the following national ministries/ government authorities/ departments and their governance systems as well.

- Ministry of Foreign Affairs, Trade & Export Development has primary responsibility for bilateral and multilateral relations with other countries and also with regional and international organisations, as well as being responsible foreign trade arrangements.
- Ministry of Legal Affairs, Labour & Consumer Affairs has primary responsibility for the drafting of legislation and regulations, and management of the legal frameworks for government operations.
- The Grenada Ports Authority has primary responsibility for maritime administration, port management of cargo handling, and port security aligned with regional and international standards.
- The Royal Grenada Police Coast Guard has primary responsibility for sea patrols, maritime law enforcement, and fisheries protection.

At the regional level, Grenada is a member of two regional fisheries bodies, the Caribbean Regional Fisheries Mechanism (CRFM) and the Western Central Atlantic Fishery Commission (WECAFC) that promote, guide and support cooperation in management of shared resources. Grenada is also one of the founding members of the Regional Security System (RSS), which coordinates regional response operations to threats to national and regional security.

Tuna and tuna-like fishes are highly migratory, oceanic resources, and hence the management of these resources are under the jurisdiction of the International Commission for Conservation of Atlantic Tunas (ICCAT), which is the regional fisheries management organisation responsible for coordinating management cooperation among countries harvesting tuna and tuna-like fish stocks within the Atlantic Ocean and its adjacent Seas. Grenada's membership in ICCAT provides an important mechanism for Grenada to cooperate with other countries to ensure sustainable fisheries management of tuna stocks shared and fished by Grenada. ICCAT keeps under review the development of the required science and management for tuna and tuna-like species included in its mandate, including measures to combat IUU fishing and to provide effective management of transshipment of fish and fish products.

The application of the Policy directly supports Grenada's compliance with ICCAT measures on transshipment, while also ensuring adherence to the FAO *Voluntary Guidelines for Transshipment*.

1.1.7.3 INPUT RESOURCES

Besides the primary fisheries governance framework, application requires inter-ministerial collaboration arrangements with the Ministry of Foreign Affairs, Trade & Export Development Ministry of Legal Affairs, Labour & Consumer Affairs, Grenada Ports Authority and the Royal Grenada Police Force Coast Guard for their respective contributions to seafood transshipment monitoring, control and surveillance activities.

In addition to existing resources of the Fisheries Division, ICCAT has established several funding arrangements to enable developing states to build their capacity. One fund (*Monitoring, Control, and Surveillance Fund* – ICCAT Recommendation 14-08) is devoted to the building of monitoring, control and surveillance capacity for fulfilling port inspection obligations, which are relevant for managing tuna transshipment operations in Grenadian waters.

The FAO *Voluntary Guidelines for Transshipment* includes provisions for recognising the special requirements of developing states, particularly to ensure that developing states have the necessary implementation capacity. In alignment with the FAO *Voluntary Guidelines for Transshipment*, the Policy gives attention to ensuring: an adequate legal and regulatory framework for transshipments and landings; an adequate institutional framework for effective implementation of transshipment regulations; adequate institutional and human resource capacity for monitoring, control, and surveillance purposes in fulfilment of the relevant flag State and port State duties; development and implementation of national Port State measures; and cooperation with ICCAT.

1.1.8 Monitoring and Evaluation

1.1.8.1 Policy Statement

The Fisheries Division, via a suitable inter-ministerial collaboration arrangement of the Ministry of Agriculture & Lands, Forestry & Marine Resources, the Ministry of Foreign Affairs, Trade & Export Development, the Ministry of Legal Affairs, Labour & Consumer Affairs, Grenada Ports Authority and the Royal Grenada Police Force Coast Guard, maintains an inter-ministerial electronic monitoring system for capture of essential data and information on seafood transshipment operations, monitoring, control and surveillance activities, illegal practices and legal action decisions.

These data and information are analysed to evaluate progress against the Policy's objectives, and by this means, facilitate support for good governance practices through an informed, responsive, and adaptive policy and management cycle.

Monitoring and reporting instruments are developed, guided by ICCAT recommendations and the FAO *Voluntary Guidelines for Transshipment* (see section 14.0). The performance of these instruments is kept under review.

1.1.8.2 Scope of Monitoring

The scope of monitoring addresses the Policy's objectives, as well as the supporting governance and management mechanisms in place.

1.1.8.3 Timelines of Monitoring

The timelines for monitoring are aligned with the relevant monitoring phase of the fisheries policy and management cycle in place. This alignment also facilitates Grenada's compliance with the annual reporting deadlines adopted by ICCAT for submission of data and information on tuna fisheries and transshipment operations.

1.1.8.4 Evaluation and Reviews

The fisheries governance framework facilitates regular evaluation and review of the Policy as a routine step of the fisheries policy and management cycle. If, however, there are changes in the national situation and/or global situation regarding transshipment operations, which result in an amendment of current national and international guidelines and management measures, or addition of new national and international guidelines and management measures, the Policy is immediately reviewed and updated accordingly.

1.1.9 Reporting

The Fisheries Division, as the competent national authority for fisheries matters, has responsibility for reporting on implementation and performance of the Policy to the Ministry of Agriculture & Lands, Forestry & Marine Resources.

Regarding international reporting obligations, monitoring and reporting instruments are developed, guided by ICCAT recommendations and the FAO *Voluntary Guidelines for Transshipment* (see section 14.0). The reporting instruments are used to support additional regional and international requests for information on Grenada's management of seafood transshipment operations, e.g. OECS, CARICOM, CRFM, WECAFC.

1.1.10 Roles and Responsibilities

1.1.10.1 Governance and Management

The Ministry of Agriculture & Lands, Forestry & Marine Resources, supported by its Fisheries Division and the fisheries governance framework, has authority and responsibility for the overall governance and management of the Policy, ensuring adherence to good governance and management practices.

1.1.10.2 General Advocacy and Education

The Fisheries Division, as the competent authority to oversee execution of the Policy, makes use of its advocacy and education programmes to educate fisheries sector stakeholders and the public about the Policy's purpose and objectives.

Supporting government partner ministries/ authorities/ departments (Ministry of Foreign Affairs, Trade & Export Development Ministry of Legal Affairs, Labour & Consumer Affairs, Grenada Ports Authority and the Royal Grenada Police Force Coast Guard) and fisheries stakeholders, particularly those engaging in seafood transshipment operations, are made aware of their counterpart responsibilities for contributing to effective Policy implementation, through information sharing and exchanges by the Fisheries Division's usual outreach mechanism and procedures.

1.1.10.3 Implementation

The Fisheries Division of the Ministry of Agriculture & Lands, Forestry & Marine Resources, the Ministry of Foreign Affairs, Trade & Export Development, the Ministry of Legal Affairs, Labour & Consumer Affairs, Grenada Ports Authority and the Royal Grenada Police Force Coast Guard have their respective roles to play in managing implementation of the Policy, in accordance with their legal mandates.

1.1.10.4 Reporting

The Fisheries Division, as the competent authority to oversee execution of the Policy, prepares all relevant administrative (governance and management implementation) and technical reports, in accordance with a results-oriented approach, and for national, regional and international accountability of Policy implementation and performance.

1.1.11 Data and Information Management

The Fisheries Division, establishes and maintains an inter-ministerial collaboration arrangement with Ministry of Foreign Affairs, Trade & Export Development Ministry of Legal Affairs, Labour & Consumer Affairs, Grenada Ports Authority and the Royal Grenada Police Force Coast Guard, to design and maintain a shared, electronic monitoring system for capture of essential data and information on seafood transshipment operations, monitoring, control and surveillance activities, illegal practices and legal action decisions.

The electronic system established and maintained, is guided by ICCAT recommendations and the FAO *Voluntary Guidelines for Transshipment*, as well as national, related policy and legislation data and information requirements by all the collaborating ministries and government agencies.

1.1.12 Management of the Policy

A results-based management (RBM) approach is adopted, consistent with the approach recommended by the Caribbean Community and Common Market (CARICOM), and to facilitate robust sector and fisheries management accountability at the national, regional and international levels.

Policy implementation reports are prepared annually to facilitate performance review, and evaluation. Recommendations for amendments to the Policy are developed in consultation with stakeholders and are submitted to Cabinet for approval.

1.1.13 Chapter Bibliography

Anon., 2019. Grenada National Ocean Policy. OECS. https://oecs.int/en/our-work/knowledge/library/ocean-governance/grenada-national-ocean-policy#:~:text=This%20National%20Ocean%20Policy%20(NOP,it%20from%202020%20until%202035.

Rennie, J. (in press). Historical Development of the Fisheries Over the Past two Decades. Grenada presentation to CRFM Scientific Conference, August 2023. CRFM Scientific Conference Publication (in press).

FAO. 2023. Voluntary Guidelines for Transshipment/Directives volontaires relatives au transbordement/Directrices voluntarias para los transbordos. Rome. https://doi.org/10.4060/cc5602t

ICCAT. 2024. Compendium Management Recommendations and Resolutions adopted by ICCAT for the Conservation of Atlantic Tunas and Tuna-Like Species. Madrid. https://www.iccat.int/en/RecRes.asp .

1.1.14 Chapter annexes – Monitoring and reporting forms recommended by ICCAT and FAO

1.1.14.1 Annex 1 - Data fields for the reporting of port inspections, formally adopted by ICCAT in 2023[1].

- Number of landings from foreign fishing vessels landing ICCAT species in their ports.
- Number of transhipments from foreign fishing vessels transhipping ICCAT species in their ports.
- Port denials and withdrawal of denials and the reasons.
- Information on the inspections carried out on these vessels in accordance with the provisions of paragraph 29[2], including:
    - Date of entry into port
    - Port
    - Inspection report number
    - Flag of vessel
    - Vessel name
    - Date of inspection
    - Infringement reported (Y/N)
    - Infringement details
    - Actions taken as a result of the detected infringement
    - Observations
    - Responses from flag State

[1] ICCAT Recommendation 23-17: *Recommendation by ICCAT amending Recommendation 18-09 on Port State Measures to prevent, deter and eliminate illegal, unreported and unregulated fishing*.

[2] Paragraph 29 of ICCAT Recommendation 23-17 states that "Each year CPCs shall inspect at least 5% of landing and transshipment operations in their designated ports as are made by foreign fishing vessels"

1.1.14.2 ANNEX 2 - INFORMATION TO BE INCLUDED IN A LANDING DECLARATION, UNIQUE IDENTIFIER, PROPOSED BY FAO.

1. Vessel name	
2. Flag State	
3. Vessel type (ISSCFV)	
4. IMO number required, if eligible	
5. External ID, if available	
6. Registration ID if different to 5	
7. International radio call sign, if available	
8. VMS tracking	
9. MMSI number, if available	
10. Vessel contact information	
Master or vessel's representative	
Phone number	
Email	
11. Vessel master name & nationality	
12. Vessel owner/company information	
Name	
Address	
Contact information *(email and phone number)*	
13. Port State	
14. Port of landing	
15. Date and time of landing	

16. * Landed fish	
Catch area(s)	
Species (FAO/ASFIS Codes)	
Product form (presentation and preservation type)	
Quantity (weight)	
Next destination, if applicable/available	
Next mode of transport and transport ID , if applicable/available	
17.* Fish retained onboard (not landed)	
Catch area(s)	
Species (FAO/ASFIS Codes)	
Product form (presentation and preservation type)	
Quantity (weight)	
18. Competent port authority	
19. Date of inspection if any	
20. Signature	
Signature vessel master	
Master's Stamp and full name	

Note: International codes as per PSMA[3] Annex D, (d), as applicable.

*Rules should be established by relevant authorities and RFMO/As to ensure consistency in how weight is reported by both donor and receiving vessels.

{Source: *FAO Voluntary Guidelines For Transshipment*}

[3] Agreement on Port State Measures to prevent, deter and eliminate Illegal, unreported and unregulated fishing

1.1.14.3 ANNEX 3 - TRANSSHIPMENT DECLARATION FORM, WITH AMENDMENT ADOPTED BY ICCAT IN 2022[4].

CP19_TransDec **Declaration number:**

Transshipment Declaration

Carrier vessel	**Fishing vessel**
Vessel Name and radio call sign:	Vessel Name and radio call sign:
Flag Country/Entity/Fishing Entity:	Flag CPC:
Flag State authorization number:	Flag CPC authorization number:
Domestic registration number:	Domestic registration number:
ICCAT Record Number:	ICCAT Record number, if applicable:
IMO Number:	IMO Number, if any:
	External identification:

	Day	Month	Hour	Year	
Name:					
Departure	__	__	__	from	_____
Return	__	__	__	to	_____
Transshipment	__	__	__		__[Min]

2_0___ Agent's name: Fishing vessel Master's name: Carrier vessel Master's Signature: Signature: Signature:

Transshipment Position _____/_____ (N/S), _____/_____ (E/W)

Indicate the weight in kilograms or the unit used (e.g., box, basket) and the landed weight in kilograms of this unit: __ kilograms

Species (by stock,* if applicable)[2]	Port	Type of Product[1] RD/GG/DR/FL/ST/OT	Net Weight (Kg)	Units (if available)	No. of units (if available)			

ICCAT Observer signature and date (if transshipment at sea):
(In the case of Force Majeure, please indicated that transshipment was unobserved)

[1] Type of Product should be indicated as Round (RD), Gilled and Gutted (GG), Dressed (DR), Fillet (FL), Steak (ST), Other (OT) (describe the type of product).

[2] A list of species by stock, with their geographic delineations, is available on https://www.iccat.int/Data/ICCAT_maps.pdf. Please provide as much detail as possible.

*If stock level information is not available, please provide explanation.

[4] ICCAT Recommendation 22-19: *Document Number on Transshipment Declaration*

1.1.14.4 ANNEX 4 – INFORMATION TO BE INCLUDED IN A TRANSSHIPMENT DECLARATION UNIQUE IDENTIFIER, PROPOSED BY FAO.

Element	Donor vessel	Receiving vessel
1. Vessel name		
2. Flag State		
3. Vessel type (ISSCFV)		
4. IMO number, required if eligible		
5. External ID, if available		
6. Registration ID if different to 5		
7. International radio call sign, if available		
8. MMSI number, if available		
9. Vessel owner/company information		
Name		
Address		
Contact information (email and phone number)		
10. Vessel contact information		
Name of master		
Nationality		
Phone number		
E-mail		
11. Transshipment authorization identifier, if any		
12. Transshipment authorization issued by		
13. Transshipment authorization period of validity		
14. Time and date of the transshipment		

Element	Donor vessel	Receiving vessel
Start (hour/day/month/year)		
End (hour/day/month/year)		
15. Transshipment location *Port/position at sea (lat./long.)*		
16. VMS tracking		
17. *Quantities onboard prior to transshipment	Donor vessel	Receiving vessel
Catch area(s) *RFMO/As/geographical location* *FAO Statistical area*		
Species (FAO/ASFIS codes)		
Product form (preservation and presentation type)		
Estimated Quantity (weight)		
18.* Transshipped fish	Donor vessel	Receiving vessel
Catch area(s) *RFMO/As/geographical location* *FAO Statistical area*		
Species (FAO/ASFIS codes)		
Product form (preservation and presentation type)		
Estimated Quantity (weight)		
19. *Fish remaining on board after transshipment		
Catch area(s) *RFMO/As/geographical location* *FAO statistical area*		

Element	Donor vessel	Receiving vessel
Species (FAO/ASFIS codes)		
Product form (preservation and presentation type)		
Estimated Quantity (weight)		
	Donor vessel	Receiving vessel
20. Observer's name and signature on board, if present		
21. Signature	Donor vessel	Receiving vessel
Master´s signature		
Master's Stamp and full name		

Note: International codes as per PSMA Annex D, (d), as applicable. *Rules should be established by relevant authorities and RFMO/As to ensure consistency in how weight is reported by both donor and receiving vessels.

{Source: FAO *Voluntary Guidelines For Transshipment*}

1.2 CHAPTER 2: GRENADA'S TUNA FISHERY MANAGEMENT AND DEVELOPMENT PLAN: 2025-2030

Susan Singh-Renton

PRELIMINARY INFORMATION

In accordance with paragraph 4 of the Fisheries Act [Act No. 15 of 1986], the Chief Fisheries Officer has responsibility for preparing and keeping under review all plans for management and development of fisheries in Grenada's waters. According to law, preparation and review of the plan shall involve broad consultation with stakeholders likely to be impacted, and with the Fisheries Advisory Committee. The agreed fisheries management and development plan shall be submitted to the Minister for approval.

DEFINITIONS

All technical terms used should be interpreted according to the definitions provided in Grenada's Fisheries Act [Act No. 15 of 1986 amended by Act No. 25 of 1989, Act No. 1 of 1999].

Executive Summary

The purpose of the Tuna Fishery Plan is to promote and manage the tuna fishery[5] of Grenada, through balanced optimisation of social and economic benefits, which is bounded by international, agreed standards and regulations for responsible fisheries management, and which is supported nationally by integrated governance for achieving an ecosystem-based approach.

Grenada has traditionally fished for tuna and tuna-like species, and its tuna fishery has grown steadily over the years, with accompanying improvement in the fishing methods used. Tuna exports are now a significant percentage of all goods exported and contribute 40% of the total fish production value. Anchored fish aggregating devices (aFADs) became a firm addition to fishing operations by 2013. The popular tuna fishing gears are longline, troll lines, and drop lines used in association with the aFADs. Tuna and tuna-like species are migratory to a greater or lesser extent and require international cooperation to ensure sustainable management of the relevant fish stocks.

The International Commission for Conservation of Atlantic Tunas (ICCAT) is the regional fisheries management organisation responsible for management cooperation among countries harvesting tuna and tuna-like fish stocks within the Atlantic Ocean and its adjacent Seas. During 1991-2017, Grenada's cooperation with ICCAT was facilitated by the observer status afforded to the Caribbean Community (CARICOM). Then, in 2017, Grenada took the decision to become a Contracting Party to ICCAT. As a member of ICCAT, Grenada has an opportunity to strengthen cooperation with ICCAT and to ensure effective representation of its tuna fishery interests.

ICCAT scientific advice on the status of stocks of interest to Grenada and the relevant, ICCAT management recommendations are considered and incorporated into the plan. A summary of the legal, policy and institutional framework is presented, as these set the national context for guiding implementation of the Tuna Fishery Plan. There are 10 long-term objectives of the Tuna Fishery Plan, which are intended to address: (i) enhancement of the fishery management system to satisfy international standards; (ii) good governance and corporate social responsibility; (iii) overall risk resilience; (iv) national objectives, e.g. food and nutrition security; (v) science-supported sustainable exploitation; (vi) regional and international cooperation; (vii) effective monitoring, control and surveillance (MCS) and illegal, unreported and unregulated (IUU) fishing; (viii) poor

[5] The tuna fishery can be defined as "public and private sector operations that are linked to the harvest of tuna and tuna-like species whether it be for subsistence or profit, and which includes governance, management and industry practices led by individuals and/ or groups with a stake in tuna fishing and value chain operations".

fishing practices and IUU fishing; (ix) the ecosystem approach and related conservation practices; (x) optimised, complementary contribution to the national blue economy. Some specific objectives are also indicated for the component of the fishery using anchored fish aggregating devices, aimed at supporting: evidence-based decision-making for sustainable use; effective MCS; accountability for environmental sustainability; and, accountability for socio-economic performance.

The Tuna Fishery Plan includes management, as well as development measures to support attainment of the objectives. In terms of the management measures, general measures and species-specific measures are identified. The general management measures are intended to: establish /expand /improve /maintain good governance practices and an active policy management cycle; establish /expand /improve /maintain the necessary supporting fisheries management, monitoring, control and surveillance systems; establish sound management strategies and procedures; and set the criteria and conditions for decision-making. Species-specific measures are those recommended by ICCAT for each of the species of interest to Grenada, and may include establishment of an annual total allowable catch (TAC) with a catch limit assigned to Grenada, minimum size limits, requirements for vessel authorisations, data improvement, observer programme establishment, etc. Other existing measures are also included, e.g., the fisher and vessel registration and licensing system, measures applied by fisherfolk organisations to regulate users of aFADs, and industry measures for value chain design improvement and protection of human rights.

Regarding development measures, consideration is given to a range of measures required to improve the enabling environment, including Grenada's formal adoption of key regional and international instruments, and national arrangements for enhanced ICCAT participation. Another proposed measure is to phase out the current paper-based system for capture of data from markets and processors, and to replace it with an electronic monitoring system that could accommodate 'real time' reporting, and help to support an increase in the types of data collected for fish stock assessments. In this regard, it is worth monitoring the outcome of current work to explore the usefulness of an Android app for improving vessel-based data capture and MSC product traceability requirements. Additionally, consideration should be given to adopting the FAO Calipseo IT solution, which is designed to keep a record of events along the seafood value chain (Laurent, 2021). As a member of ICCAT, Grenada can agree to participate in cooperative research programmes, as it did in earlier years for billfish, which would strengthen national knowledge and understanding about the biology and ecology of tuna resources available to Grenada's tuna fishery, and elevate Grenada's international cooperation profile.

To develop further the monitoring, control and surveillance system, an observer plan and vessel monitoring plan are recommended and designed to comply with ICCAT's minimum standards. ICCAT has set aside certain funds that are available to developing member states to build capacity in the implementation of port state measures and observer programmes. Grenada should explore also options for sharing the enforcement burden through improved working relations with its national Coastguard/ Police, and at the regional level through the Regional Security System. Finally, the plan urges industry partners to consider measures to optimise their contributions for safeguarding the sustainability of the fishery and dependent ecosystems, for waste management, and for corporate social responsibility.

1.2.1 INTRODUCTION

1.2.1.1 DESCRIPTION OF TUNA FISHERY

Grenada is a small island, archipelagic state, located in the southeast Caribbean (12.1165°N, 61.6790°W). Its claimed Exclusive Economic Zone is 26 133 km^2, and the island has an extensive shelf of 2 798 km^2(CRFM 2021). A range of marine habitats is present, which supports various types of fisheries. These can be classified into three main types of fisheries: reef and demersal fisheries; small coastal pelagic fisheries; and, oceanic pelagic fisheries. Popular gears include hook and line, longline, nets, traps, and dive gear. Fishing operations are classified according to purpose: occasional (for recreation and consumption); sport/ recreational (these may engage in some commercial activity); subsistence; artisanal; and, commercial (Isaac, 2014). There are 36 landing sites used by fishers: 9 primary landing sites, having physical infrastructure and able to facilitate fisheries staff and data collection activities; 23 secondary landing sites that are essentially beaches; and, 4 tertiary landing sites which are serviced by fish processors and exporters (Op. cit.).

There are four types of fishing vessels that participate in Grenada's large pelagic fishery. There are three types of longliners: Type I - 4.5-7m LOA, equipped with outboard engines, and capable of deploying 50 hooks during single-day trips; Type II - 7.3 to 8.8.m LOA, also equipped with outboard engines, but with capacity to deploy over 200 hooks, use an ice box and conduct 2-day trips; Type III - 9.7 to 16m LOA, with inboard diesel engines and capacity for fishing over 400 hooks, and cold storage to accommodate multi-day trips (Isaac, 2014). The fourth type of fishing vessel is an open-decked wooden or fibreglass pirogue, using troll and/ or drop lines. In 2018, the number of active Types I and II longliners was 65, while the number of active Type III longliners was 127 (Gentner *et al.,* 2018).

Between 2003 and 2023, the total number of fishing vessels increased from 601 to 990, and the number of fishers increased from 1970 to 4360 (Rennie, in press). In the same period, overall fish production increased only slightly, from 5.6 million lbs (2546 t) to 6 million lbs (2727 t), while exports declined from 1.5 million lbs (682 t) to 1.4 million lbs (636 t). Notwithstanding, the monetary value of fish production and fish exports both increased, just over 50% and 37% respectively, between 2003 and 2023 (Op. cit). Gentner *et al*. (2018) noted that fresh tuna exports contributed 18% of the total value of exported goods from Grenada in 2016, highlighting the high importance of this resource for foreign exchange earnings. In 2023, national fish production was estimated to have a value of XCD 40 million. Of this, 1.4 million lb (636 t) of fish were exported, with an estimated value of XCD 16 million or 40% of the total fish production value. These data reaffirm the valuable contribution of the fish export industry to Grenada.

Grenada's oceanic pelagic fishery has steadily developed since longline technology was introduced with the support of a fisheries training school established in 1979 (Rennie, in press). The use of anchored fish aggregating devices (aFADs) became a firm addition to pelagic fishing operations by 2013 (Isaac, 2014). At that time, six aFADs were deployed: five along the east coast of Grenada, and one off the coast of Carriacou. While oceanic pelagic species comprised 49% of national fish production in 1990, this amount had increased to 79% of fish production by 2013. Longline, troll lines and drop lines are the popular gears used to fish for oceanic pelagic species, with troll lines typically used by the smaller fishing vessels and drop lines used when fishing around aFADs (Gentner *et al*., 2018). During 1980-2000, the government worked to commercialise the scale of fishing operations, while exploring both local and external markets and their quality assurance needs. These efforts helped to increase private sector investments. Current and future interests of the fisheries sector will require investment by both the public and private sector to strengthen performance in a wide range of areas, including, *inter alia*: national fisheries governance and management; cooperation with regional fisheries management organisations (RFMOs) and other regional fisheries bodies (RFBs) for sustainable management of tuna and tuna-like fish stocks that are highly migratory and warrant such cooperation under international law; fisheries diversification and expansion, including value chain design development and minimisation of both food waste and inedible fish waste; climate change mitigation and adaptation; comprehensive social protection; and, risk management.

Grenada's oceanic pelagic fishery harvest is composed of several tuna and tuna-like species, all of which are migratory to a greater or lesser extent and so belong to fish stocks that are shared, straddling or highly

migratory. Moreover, for several species, there is clear evidence of long-distance fish movements (e.g. ICCAT, 2024), which reaffirm the need for international cooperation to ensure sustainable management of the relevant fish stocks.

The International Commission for Conservation of Atlantic Tunas (ICCAT) is the RFMO that has legal authority for coordinating management cooperation among countries harvesting tuna and tuna-like fish stocks within the Atlantic Ocean and its adjacent Seas (the ICCAT Convention Area, hereinafter ICCAT CA). Since 1991, Grenada's cooperation with ICCAT has been facilitated by the observer status, representation and participation granted to the Caribbean Community (CARICOM) and executed by the CARICOM Fisheries Resource Assessment and Management Programme (CFRAMP) during 1991-2002, and by the Caribbean Regional Fisheries Mechanism (CRFM) since 2003. In view of the increasing tuna fishery investments and overall socio-economic and food security value of the tuna fishery, Grenada became a Contracting Party to ICCAT in 2017. Such membership affords a more direct mechanism for Grenada to formalise and deepen its cooperation with ICCAT and to ensure that its tuna fisheries interests are suitably considered in sustainable tuna fishery management decisions.

1.2.1.2 STATE OF TUNA AND TUNA-LIKE STOCKS

In determining suitable management actions, ICCAT coordinates research and assessment on Atlantic tunas and tuna-like species on an annual basis. ICCAT's Standing Committee on Research and Statistics (SCRS) is responsible for conducting annual reviews and evaluations of fishery data, and for providing the most recent information on the state of exploitation of the various Atlantic tuna and tuna-like fish stocks. Several of these are of interest to Grenada (ICCAT 2024s), evidenced by the reporting of annual catches to ICCAT over the years. For those species for which Grenadian catches appear in the ICCAT SCRS report (ICCAT 2024a), the most recent ICCAT SCRS stock status advice for each of these species follows.

1.2.1.2.1 YELLOWFIN TUNA

A single yellowfin tuna stock is believed to exist in the ICCAT CA, and evidence of trans-Atlantic movements from tagging studies has supported this hypothesis. The most recent ICCAT assessment was completed in 2019, which estimated the median Maximum Sustainable Yield (MSY) value to be 121,298 t. The overall stock assessment result indicated that there was a 54% probability that the Atlantic yellowfin tuna stock was not overfished[6], and that overfishing[7] was not taking place. The SCRS had concerns about increasing mortality of juvenile yellowfin tuna, and that if the level of annual total catches were allowed to exceed 120,000 t, these conditions would cause stock health to deteriorate and cause a reduction in the long-term sustainable yield.

1.2.1.2.2 WESTERN ATLANTIC SKIPJACK TUNA

Separate eastern and western Atlantic stocks are believed to exist in the ICCAT CA. So far, tagging studies have not provided clear evidence on large-scale trans-Atlantic movements. Grenada's fishery harvests from the western Atlantic stock. The most recent stock assessment of the West Atlantic stock was completed in 2022 and estimated a median MSY of 35,277 t. There was a high (91%) probability that the stock was in a good condition, i.e. not overfished and with no overfishing taking place. The SCRS noted that maintaining catches at the level of the estimated median MSY would give a 70% probability of the stock remaining in a good condition at least until 2028.

1.2.1.2.3 BIGEYE TUNA

[6] The status of a tuna population is determined both by the level of fish population biomass and the level of mortality caused by fishing. A tuna population is determined to be overfished by ICCAT if the fish population biomass declines below the level that is naturally capable of supporting a maximum sustainable yield/ catch. The ICCAT scientific assessments allow for error in data and analysis, and hence usually give the result as a probability (percentage) estimate. Where there is certainty that the population is not overfished, no probability estimate is quoted.

[7] Overfishing means that the mortality caused by fishing has exceeded the level that allows the fish population's natural capability to support a maximum sustainable yield/ catch. The ICCAT scientific assessments allow for error in data and analysis, and hence usually give the result as a probability (percentage) estimate. Where there is certainty that no overfishing is taking place, no probability estimate is quoted.

A single stock is believed to exist in the ICCAT CA. The most recent ICCAT stock assessment was completed in 2021, using data up to 2019. The average MSY for bigeye tuna was estimated to be 86,833 t. The assessment results indicated a 58% probability that the stock was in an overfished state, and 50% probability that overfishing was taking place. Similar to the case of the yellowfin tuna stock, the SCRS noted concerns about increased harvests of juvenile bigeye tuna, that could decrease the long-term yield of the stock. Maintaining an annual TAC of 61,500 t, established in 2019, would give 97% probability of maintaining the stock in a good condition.

1.2.1.2.4 North Atlantic Albacore tuna

Based on information about its biology, three stocks are believed to exist in the ICCAT CA: north and south Atlantic stocks, separated at 5°N, and a Mediterranean stock. Grenada's fishery harvests from the north Atlantic stock. The most recent stock assessment was completed in 2023, and while SCRS reported a large uncertainty about current stock status, it also reported a high probability (>99%) of the stock not being overfished, and not subjected to overfishing. A Management Procedure (MP) is in place for north Atlantic albacore, and its TAC is set at 47, 251 t for the period 2024-26. While this TAC is higher than the estimated mean MSY of 41,995 t, the SCRS indicated that it would be sustainable in the short-term owing to the current biomass level being more than twice the biomass required for MSY.

1.2.1.2.5 Atlantic blue marlin

Based on tagging and biological information, a single stock for the ICCAT CA is assumed. The most recent stock assessment was completed in 2018. The ICCAT SCRS highlighted uncertainties in the data used and information about stock productivity. The median MSY was estimated to be 3001 t, with a 96% probability of the stock being overfished, and a 54% probability that overfishing was occurring. This situation had not improved since the previous 2011 assessment, owing to the TAC not being respected in the intervening years. The increasing catches of blue marlin by artisanal fisheries, particularly anchored FAD (aFAD) fisheries, was a source of concern, especially as such harvest data for these fisheries remained incomplete. A total landing limit of 1670 t has been in place since 2020.

1.2.1.2.6 Atlantic white marlin & roundscale spearfish

Based on tagging and biological studies, a single ICCAT CA stock unit is assumed. In view of evidence that white marlin catches include a notable amount of roundscale spearfish, the ICCAT SCRS noted that the historical catch data likely included a combination of the two species. In view of this, the latest ICCAT stock assessment, completed in 2019, was an assessment of the two species/ stocks combined. The result showed a 99% probability of the stock being overfished, but overfishing was not occurring. Similar to the case of the blue marlin, there was a strong concern about data quality, including lack of data on several artisanal and recreational fishery operations, as well as lack of data on discards. Additionally, there was concern about catches regularly exceeding the overall established catch limit. A total landing limit of 335 t has been in place since 2020.

1.2.1.2.7 Western Atlantic sailfish

Based on biological and tagging studies, an eastern and western Atlantic stock units are assumed. Additionally, sailfish appear to be more coastal and show shorter range movements than other billfish species. Grenada harvests the western Atlantic stock and is acknowledged as having a significant longline and artisanal fishery for sailfish. The most recent ICCAT SCRS assessment was completed in 2023: the median MSY was estimated to be 1612 t, with a 59% probability of the stock remaining overfished, but a 98% probability of overfishing not occurring. As for other billfishes, the ICCAT SCRS expressed concerns about data daps in the historical data and catch under-reporting and non-reporting issues.

1.2.1.2.8 North Atlantic swordfish

Based on biological and tagging research, three stock units are assumed: north and south Atlantic swordfish, separated at 5°N, and a Mediterranean stock. Grenada's fishery harvests from the north Atlantic stock. The most recent stock assessment by ICCAT SCRS was completed in 2022. The 2022 assessment estimated the median MSY to be 12,819 t, with a 63% probability of the stock not being overfished and subject to overfishing.

The SCRS noted that its advice was unable to account fully for under-reporting of discards, quota carryover and transboundary quota transfer arrangements and the situation of catch allowances to ICCAT Contracting Parties and Cooperating Parties if fully realised.

1.2.1.2.9 SMALL TUNAS

Small tunas includes the following species: blackfin tuna (*Thunnus atlanticus*); bullet tuna (*Auxis rochei*); Atlantic bonito (*Sarda sarda*); plain bonito (*Orcynopsis unicolor*); Serra Spanish mackerel (*Scomberomorus brasiliensis*); cero (*Scomberomorus regalis*); narrow-barred Spanish mackerel (*Scomberomorus commerson*); frigate tuna (*Auxis thazard*); king mackerel (*Scomberomorus cavalla*); little tunny (*Euthynnus alletteratus*); West African Spanish mackerel (*Scomberomorus tritor*); Atlantic Spanish mackerel (*Scomberomorus maculatus*); wahoo (*Acanthocybium solandri*). The narrow-barred Spanish mackerel and West African Spanish mackerel are not harvested by Grenada. From a social and economic standpoint, small tunas are very important to many coastal communities, and to artisanal fisheries, including those of Grenada. The increased use of aFADs in the Eastern Caribbean and other areas have improved the efficiency of harvesting operations.

In view of data limitations for most of the small tuna stocks, the ICCAT SCRS has been exploring application of data limited methods of assessment: productivity and susceptibility analysis (PSA), and examination of length-frequency data to determine if these could be used to identify instances of growth and recruitment overfishing; catch-based assessment models; and, length-based assessment models. A data-limited management strategy evaluation (MSE) was also explored for wahoo in the north-west Atlantic. The ICCAT SCRS noted its intention to continue work on developing the PSA, length-based methods and a data-limited MSE for small tuna stocks. The ICCAT SCRS also emphasised the importance of improving monitoring programmes.

1.2.1.3 PURPOSE

The purpose of the Tuna Fishery Management and Development Plan (hereinafter Tuna Fishery Plan) is aligned with the purpose of the current Fisheries Act, which serves "*to provide for the promotion and management of fisheries in the fishery waters of Grenada, and for incidental and connected matters.*" [Act No. 15 of 1986 amended by Act No. 25 of 1989, Act No. 1 of 1999]. Part II, section 4 of the Fisheries Act makes provisions for the fisheries management and development plan, noting that such a plan shall: "identify each fishery and assess the present state of its exploitation; specify the objectives to be achieved in the management of each fishery; specify the management and development measures to be taken; and (d) specify the licensing programmes to be followed for each fishery, the limitations (if any) to be applied to local fishing operations and the amount of fishing (if any) to be allocated to foreign fishing vessels. The present Tuna Fishery Plan considers the vision, goals and actions proposed under Grenada's draft National Ocean Policy (NOP), which acknowledges the need for an integrated governance approach that incorporates social and environmental goals into economic development planning (Anon. 2019).

As already noted, tuna and tuna-like fish resources are migratory and hence their management within the Atlantic Ocean is internationally coordinated by ICCAT. Grenada became a Contracting Party to the ICCAT Convention in 2017, to safeguard national tuna fishing industry interests for present and future generations. For this reason, arrangements for cooperation with ICCAT and compliance with agreed ICCAT management and conservation measures for Atlantic tuna and tuna fisheries are an integral part of the present Tuna Fishery Plan. In view of recent work by a component of the tuna fishery to evaluate its performance against the Marine Stewardship Council (MSC) Standard and to use the evaluation results to inform a Fisheries Improvement Project (FIP) (Anon. 2020), compliance with the MSC Standard is likewise considered.

The purpose of the Tuna Fishery Plan is therefore to promote and manage the tuna fishery of Grenada, through balanced optimisation of social and economic benefits, which is bounded by international, agreed standards and regulations for responsible fisheries management, and which is supported nationally by integrated governance for achieving an ecosystem-based approach. The 5-year life span of the Tuna Fishery Plan is established to allow a phased approach to the establishment of all the measures noted, such that all measures are to be fully in place by June 2030.

1.2.1.4 SCOPE

The scope of the Tuna Plan is :

(i) **Species** - All tuna and tuna-like species, and all other species caught in association with the tuna fishery.
(ii) **Fishing activities** – subsistence fishing, artisanal fishing, commercial fishing, recreational fishing, sport fishing, research fishing, exploratory/ test fishing.
(iii) **Fishing methods** – All fishing methods used to catch tuna and tuna-like species, including use of fishing aids, such as fish aggregating devices (FADs).
(iv) **Related activities** - use of FADs, bait fishing, and all other services relating to the tuna fishery, including market activities, processing activities, port management activities, transshipping activities, and seafood trade.
(v) **Areas covered for licensing** – Grenada's fishery waters, the High Seas, and other maritime jurisdictions, where Grenada-flagged tuna fishing vessels are granted permission to conduct fishing and fishing-related activities.
(vi) **Areas covered for management of flagged vessels** – Grenada's fishery waters, the High Seas, and other maritime jurisdictions, where Grenada-flagged tuna fishing vessels are granted permission to conduct fishing and fishing-related activities.

1.2.2 LAYOUT OF THE PLAN

The Tuna Fishery Plan is designed to be a user-friendly reference and daily working document for all stakeholders (policy makers, managers and industry participants).

To assist users, the plan is organised into specific sections, with their content summarised as follows:

Section 1: Introduction – This provides a summary description of Grenada's tuna fishery, fishery trends, and the state of exploitation. The section explains also the purpose and scope of the Tuna Fishery Plan.

Section 3: Legal, policy and institutional framework – An overview is provided of the national legal, policy and institutional framework that currently support the fisheries sector.

Section 4: Management and development objectives – These are formulated to incorporate the aims of the Fisheries Act and relevant policies, the MSC Standard and ICCAT's objective.

Section 5: Management measures – These provide the national management measures in place, and include ICCAT recommended measures for management to the extent practical.

Section 6: Development Measures – These are national measures for development of the tuna fishery and includes the relevant elements of ICCAT management measures that should be incorporated in the near future.

Section 7: Bibliography – This provides a list of sources consulted.

Section 8: Annexes – These provide some examples data forms used by Grenada, and also an Observer Plan and a Vessel Monitoring System (VMS) Plan.

1.2.3 LEGAL, POLICY & INSTITUTIONAL FRAMEWORK

Legislation framework - The primary legislation for supporting fisheries management and development in Grenada is the Fisheries Act [Act No. 15 of 1986 amended by Act No. 25 of 1989, Act No. 1 of 1999]. The Fisheries Act is intended "*to provide for the promotion and management of fisheries in the fishery waters of Grenada, and for incidental and connected matters*." Additional, supporting legislation instruments include:

Fisheries Regulations, 1987

Fisheries (Fishing Vessels Safety) Regulations SRO #3, 1990:

Fisheries (Amendment) Regulations SRO #24, 1996

Fisheries (Amended) Regulations SRO #2, 2001

Fisheries (Amendment) Act #1, 1999

Fish and Fishery Products Regulations SRO #17, 1999

Fisheries (Marine Protected Areas) Regulations SRO #78, 2001.

Part II, section 4 of the Fisheries Act makes provisions for the establishment of a fisheries plan for the management and development of fisheries, noting that the fisheries plan shall: "(a) identify each fishery and assess the present state of its exploitation; (b) specify the objectives to be achieved in the management of each fishery; (c) specify the management and development measures to be taken; and (d) specify the licensing programmes to be followed for each fishery, the limitations (if any) to be applied to local fishing operations and the amount of fishing (if any) to be allocated to foreign fishing vessels."

Policy framework - A draft Fisheries and Aquaculture Policy for Grenada was prepared in 2012 (Anon. 2012). The policy's analysis of the administration, governance and management environment, as well as the human and financial resource constraints faced by Grenada as a Small Island Developing State, remain applicable. The policy notes that the Ministry of Agriculture & Lands, Forestry & Marine Resources and the Coastguard/ Police have direct responsibility for sector governance and management. The Coastguard/ Police assists with surveillance and enforcement activities, as well as sea safety, especially management of search and rescue. Likewise, the Ministry, with responsibility for health matters, serves as the Competent Authority for food safety and hygiene. Other ministries and other government bodies were also identified as important partners, in that they were involved in management of issues that impact the performance of the fisheries sector, e.g. exports, coastal zone management, environmental management, labour and finance (op. cit.). In more recent years, as climate change impacts worsen and in the wake of the COVID-19 pandemic, the social, economic and environmental dimensions of risk resilience and emergency preparedness are clear priorities. In this regard, the ministries responsible for disaster risk management and social protection must be added to the list of essential government partners to the fisheries sector.

Five policy themes were identified, which continue to be important for Grenada, that is: enhancing the status and capabilities of fishermen; sustainable stewardship & conservation of aquatic resources; realising the development potential inherent in the sector; maintaining the sector's role in sustaining livelihoods of the disadvantaged; and generating a positive interaction with Grenada's wider economic community (Anon. 2012).

In 2019, a National Ocean Policy (NOP) was drafted (Anon. 2019), the vision for which embraces sustainable resource management to maximise blue economy potential, while simultaneously achieving resilience to climate change impacts, and conserving marine ecosystems and the natural and cultural heritage for present and future generations. The underpinning principles of the NOP incorporate the essentials of sustainable development, good governance, responsible fisheries management, international norms regarding human and social rights and privileges. Several policy outcomes, with accompanying goals and actions were identified, which reaffirmed the importance of achieving sustainable socio-economic development and an optimised blue economy through application of an evidence-based, integrated approach for management of the environmental, social and economic components.

Institutional framework - The Fisheries Division, under the leadership of the Chief Fisheries Officer, and operating under the direction of the Ministry of Agriculture & Lands, Forestry & Marine Resources, has responsibility for the daily management of the sector's affairs. In this task, the Fisheries Act includes a provision for the Fisheries Division to be supported by a Fisheries Advisory Committee (FAC) to advise on the management and development of fisheries. The FAC includes the Chief Fisheries Officer, and other members who can serve the purpose of the FAC; these other members are selected by the Minister.

At present, the FAC is an inactive body, but if it is revived, it can be used to strengthen the working relations, as previously mentioned and as the need arises, among public sector entities for an integrated approach, and with the private sector for ensuring good governance practices and successful co-management. Furthermore, there are several active fisherfolk associations/ groups throughout Grenada, which are well-positioned and very valuable partners for supporting fisheries governance and management at the local community level. The national Coastguard/Police is an essential component of the institutional framework, holding full responsibility for national security issues, sea safety, and sea patrols.

1.2.4 MANAGEMENT AND DEVELOPMENT OBJECTIVES

1.2.4.1 LONG-TERM OBJECTIVES OF THE TUNA FISHERY PLAN

Adapted from Finlay (2002) and updated to address current needs and challenges within the national and international fisheries management and development environment, the long-term management and development objectives of the Tuna Fishery Plan follow.

1. To support an effective tuna fishery management system that operates according to agreed national and international laws and standards and that incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.
2. To support conformity of tuna fishery governance, management behaviours and practices with international agreed standards, and by this means, promote responsible industry practices for decent work, occupational safety, and social equity.
3. To promote management and development approaches that incorporate needs for ensuring social, environmental, and economic resilience.
4. To support optimisation of the tuna fishery's contributions to national objectives for food and nutrition security, economic development and diversification, social protection and development, risk resilience, and positive alignment with other sectors using the marine space.
5. To support sustainable exploitation of the tuna fishery and recovery of any depleted stocks, informed and kept under review by the best available science information and that incorporates the precautionary approach.
6. To foster cooperation with other countries in the research and management of shared stocks of tuna and tuna-like fishes, through ICCAT, and other relevant, regional fisheries arrangements.
7. To support effective monitoring, control, and surveillance (MCS) strategies and measures to prevent, deter and eliminate illegal, unreported and unregulated (IUU) fishing activities related to the tuna fishery.
8. To ensure that national fishery waters, fish stocks, habitat and sea space are protected from misuse by either local or foreign fishers.
9. To support management and development measures that serve to maintain the structure, productivity, function and diversity of the ecosystem, including habitat and associated dependent and ecologically related species, on which the tuna fishery depends.
10. To keep the objectives of the tuna fishery suitably aligned with the objectives of other fisheries and other sectors comprising the blue economy.

1.2.4.2 SPECIFIC OBJECTIVES RELATING TO ANCHORED FAD (AFAD) FISHERY

At the regional level, CRFM developed a sub-regional aFAD management plan for the Eastern Caribbean (CRFM, 2015b), which was scaled up to a wider WECAFC regional plan in 2023 by FAO (in prep.).

Consistent with the recommendations of the regional aFAD fishery management plan, the objectives of the aFAD fishery for tuna and tuna-like species are:

1. To support a science-based approach to aFAD fishery management.
2. To improve the national system for the collection, integration, sharing, and restitution of fishery-dependent data.
3. To improve the monitoring, control, and surveillance (MCS) of the aFAD fishery for effective implementation of applicable fishery regulations.
4. To keep under review and be accountable for the environmental sustainability of aFAD fisheries.
5. To keep under review and be accountable for socio-economic performance and sustainability of aFAD fisheries in accordance with regional and international guidelines and standards.

1.2.5 MANAGEMENT MEASURES

1.2.5.1 GENERAL MEASURES

To achieve the long-term management and development objectives, the following general actions/ measures are proposed for the period 2025-2030.

1. Maintain all components of the fishery management system for compliance with international guidelines for responsible fisheries management, including *inter alia*: the supporting legal framework that should include dispute resolution; the fisheries management cycle for ensuring that tuna fishery management and development objectives and regulations are kept current and relevant; open and equitable stakeholder participation in the fisheries management cycle, especially its planning and decision-making processes; MCS system.
2. Considering the sustainability requirements for both fishery resources and the associated ecosystems, expand and optimise the tuna fishery's capacity to contribute to national objectives for food and nutrition security, economic development and diversification, social protection and development, and risk resilience.
3. Implement governance arrangements and practices for comprehensive, informed and organised stakeholder participation in the fishery management and development planning and decision-making process.
4. Implement management and development approaches and measures that incorporate provisions for social equity, decent work, and safety at sea.
5. Implement measures that ensure good risk management, including climate change adaptation, and for social, economic and environmental resilience.
6. Exploit tuna and tuna-like fish stocks in a manner to ensure maximum sustainable catch, informed by the best available science and understanding about stock biology and ecology, and of the ecological risk of the effects of fishing.
7. Adopt a robust and precautionary harvest strategy, with well-defined harvest control rules, for each of the tuna and tuna-like stocks caught by the national fishery, aligned with relevant ICCAT recommendations.
8. Adopt a robust management strategy to minimise the risks of fishing on the status of stocks of other species caught or harmed in association with the tuna fishery, and on the normal structure, productivity, function and diversity of the ecosystems so affected.
9. Maintain a data, information and knowledge system on the performance of the tuna fishery plan against the agreed management and development objectives and accompanying measures, and which is accessible to stakeholders to support their effective participation in the fisheries management cycle.
10. Strengthen and maintain an adequate monitoring, control and surveillance (MCS) system for the tuna fishery to ensure management compliance, including a formal licensing and registration system, and a system of established penalties/ sanctions for various actions of non-compliance.
11. Establish and implement a collaboration arrangement with the ministries responsible for border security and law enforcement for supporting their contribution to implementation of the agreed MCS system and MCS data, information, and knowledge management.
12. Use the FAC to foster inter-ministerial collaboration on cross-cutting issues, e.g. emergency management, risk management, social protection, seafood safety, illegal environmental practices, development finance, border security, law enforcement.
13. Keep under review the subsidies and concessions regime, so that these serve as positive incentives for responsible fisheries management and do not support over-capitalisation of the tuna fishery and resource over-exploitation.

1.2.5.2 SPECIES-SPECIFIC MANAGEMENT MEASURES

The species-specific management measures are to be reviewed and updated annually, for alignment with new and amended measures adopted by ICCAT at its Commission meeting in November each year. New and amended ICCAT regulations usually enter into force by June of the following year or six months following the formal ICCAT notification of adoption of the new measures. In view of this ICCAT management cycle, Grenada's tuna fishery management cycle should review and amend these species-specific management measures and the national tuna fishery regulations to ensure enforcement in accordance with ICCAT's schedule. For measures dealing with limited entry and minimum size limits, the FAC is expected to review and set target dates for implementation.

1.2.5.2.1 TROPICAL TUNAS

The following measures are guided by ICCAT Recommendations 22-01 (Recommendation by ICCAT replacing Recommendation 21-01 on a multi-annual conservation and management programme for tropical tunas) and 23-01 (Recommendation by ICCAT extending and amending Recommendation 22-01 on a multi-annual conservation and management programme for tropical tunas).

1.2.5.2.1.1 Catch limits

1. Implement the provisions of ICCAT's multi-annual conservation and management programme for tropical tunas (yellowfin tuna, bigeye tuna and western Atlantic skipjack tuna).
2. Yellowfin tuna – Currently, a Total Allowable Catch (TAC) of 110,000 t is in place, but individual country catch quotas and catch limits are not established.
3. Bigeye tuna – Currently, a TAC of 62,000 t is in place. For Grenada with recent average annual catch of less than 1000 t, catch and effort levels should remain at the current level. If the catch limit is exceeded, the catch limit is adjusted downwards by 100% of the overage in the adjustment year (2 years later). If the catch limit is exceeded during any two consecutive years, the limit could be subjected to a reduction on or before the adjustment year (2 years later) by at least 125% of the overage value.
4. Western Atlantic skipjack tuna – No overall TAC is in place.

1.2.5.2.1.2 Fishing plans and capacity limitations

1. An annual capacity/ fishing plan is required for Grenada that catches more than 1000 t of tropical tunas annually. This plan should be submitted by 31 January each year and should outline how, at minimum, longline fishing capacity will be managed to ensure that catch limits are respected. If fleet expansion is planned, Grenada is to provide a statement of its development intentions in its capacity/ fishing plan, providing details of proposed fleet additions, including vessel size and gear type.

1.2.5.2.1.3 Vessels 20m Length Overall (LOA) or greater

1. Specific authorisations are issued for vessels 20m LOA or greater, fishing for tropical tunas. A list of these authorised vessels is submitted to ICCAT each year.
2. For unauthorized vessels taking tropical tunas as bycatch only, such vessels would need to obtain approval for their level of bycatch, which must be included in the country's overall catch limit.
3. A minimum of 10% scientific observer coverage is expected for such vessels, through presence of a human observer, and/ or an electronic monitoring system (EMS). Administration and data collection for this observer programme should comply with ICCAT minimum standards (ICCAT Recommendation 16-14). Administration of an EMS should comply with ICCAT minimum standards (ICCAT Recommendation 23-18). Given that the very few numbers of vessels 20m LOA or greater, Grenada's Fisheries Division will explore a practical EMS option and seek ICCAT approval for application.

1.2.5.2.1.4 Anchored FAD management

1. While ICCAT measures are focused predominantly on drifting FADs used by purse seine and baitboat vessels, Grenada is working to minimise the ecological impact of its anchored FADs. CRFM and WECAFC

prepared a 5-volume series of manuals, which are applicable to the Grenada situation, and are used to guide management of aFAD fishing operations.

2. A regional aFAD fisheries management plan (FAO, in prep.), and a model logbook (CRFM, 2015b) are being used to guide aFAD fisheries management measures.

1.2.5.2.2 NORTH ATLANTIC ALBACORE TUNA

The following measures are guided by ICCAT Recommendation 2023-05 (Recommendation by ICCAT amending the recommendation 21-04 on conservation and management measures, including a management procedure and exceptional circumstances protocol, for north Atlantic albacore), and by ICCAT Recommendation 21-04 (Recommendation by ICCAT on conservation and management measures, including a management procedure and exceptional circumstances protocol, for north Atlantic albacore).

1.2.5.2.2.1 Catch limits

1. ICCAT has established a Management Procedure (MP) that integrates a Harvest Control Rule (HCR) into the setting of a constant annual TAC every 3 years.
2. The annual TAC for the period 2024-2026 is 47,251 t.
3. The allocated annual catch limit for Grenada is 302 t.
4. Unused portion of the annual catch limit (catch underage) or a catch overage is subject to a catch limit adjustment in the agreed adjustment year (2 years later). Currently, only up to 25% of the initial catch limit can be carried over in any given year in the case of a catch underage.

1.2.5.2.2.2 Vessels 20m LOA or greater

1. Specific authorisations are issued for vessels 20m LOA or greater, fishing for north Atlantic albacore. A list of these authorised vessels is submitted to ICCAT each year.
2. For unauthorized vessels taking north Atlantic albacore as bycatch only, these vessels would need to obtain approval for their level of bycatch, which must be included in the country's overall catch limit.

1.2.5.2.3 BLUE MARLIN, WHITE MARLIN & ROUNDSCALE SPEARFISH

The following measures are proposed based on active ICCAT Recommendation 19-05 (Recommendation by ICCAT to establish rebuilding programs for blue marlin and White marlin /roundscale spearfish).

1.2.5.2.3.1 Catch limits

1. ICCAT established an annual limit of 1,670 t for blue marlin and of 335 t for white marlin/roundscale spearfish in 2020.
2. The allocated catch limit for Grenada is 10 t for blue marlin and 2 t for white marlin & roundscale spearfish.
3. There is no provision for carry over of underharvests.
4. If any of these limits is exceeded during any two consecutive years, the limit could be subjected to a reduction on or before the adjustment year (2 years later) by at least 125% of the overage value.

1.2.5.2.3.2 Live Release

1. Given that billfish are caught for local consumption, Grenada is exempted from live release, but must adhere to its landing limits and submit the required Task I and Task II data required by the ICCAT SCRS.
2. Measures for recreational and sport fisheries:
   (i) live releases should be conducted in a manner that causes the least harm.
   (ii) Adhere to the following minimum size limits for retention: 251 cm Lower Jaw-Fork Length (LJFL) for blue marlin and 168 cm LJFL for white marlin/roundscale spearfish.
   (iii) The sale, or offering for sale, of any part or whole carcass of blue marlin or white marlin/roundscale spearfish is prohibited.

1.2.5.2.3.3 Discards, recreational/ sport fisheries & observer programme

1. Fishing vessels are to record, in their logbooks, data on live and dead discards of these species.
2. Collect data on recreational and sport fishing operations.
3. Establish an observer programme to achieve a minimum of 5% scientific observer coverage in recreational and sport fisheries tournaments.

1.2.5.2.4 WESTERN ATLANTIC SAILFISH

The following measures are proposed, based on ICCAT Recommendation 16-11 (Recommendation by ICCAT on management measures for the conservation of Atlantic sailfish).

1. The TAC of western Atlantic sailfish must not exceed 1,030 t.
2. To limit catches of sailfishes by longline vessels, the use of circle hooks is strongly encouraged.
3. Sailfishes that are still alive when longline gear is hauled, must be released live to the extent possible.
4. Recreational and sport fisheries should release all sailfish caught alive.
5. A minimum size limit for landed sailfish of 135 cm LJFL (lower jaw fork length) is established for the recreational/ sports fishery and longline fishery. Other fisheries are allocated a minimum allowance of 2 undersized sailfish per fishing trip. [NB: Length at 50% maturity, L50, was estimated at 135 LJFL for male sailfish in Western Atlantic (ICCAT, 2024)].

1.2.5.2.5 NORTH ATLANTIC SWORDFISH

The following measures are guided by ICCAT Recommendation 17-02 (Recommendation by ICCAT amending the recommendation for the conservation of North Atlantic swordfish, Rec 16-03) and ICCAT Recommendation 23-04 (Recommendation by ICCAT replacing recommendation 22-03 extending and amending recommendation 17-02 for the conservation of North Atlantic swordfish).

1.2.5.2.5.1 Catch limits and minimum size limit

1. An annual TAC of 13,200 t has been established by ICCAT, and remains in place until 2024.
2. Longline vessels are to submit data on catch, including discards, catch-at-size, location and date of capture.
3. At present, no catch limit is assigned to Grenada. *NB: During the period 2015-2022, Grenada's annual reported catches of north Atlantic swordfish showed wide fluctuation with an average annual total catch of 28 t. In view of the multi-species nature of the Grenada tuna fishery, a catch limit of at least 28 t is required to meet the needs of the existing fleet*.
4. Consistent with the ICCAT recommendation, a minimum fish size limit of 25 kg or 125 cm LJFL is established. Incidental landings of under-sized fish should not exceed 15% of the total number of swordfish caught per vessel per trip.

1.2.5.2.5.2 Vessels 20 m LOA or greater

1. Specific authorisations are issued for vessels 20m LOA or greater, fishing for north Atlantic swordfish. A list of these authorised vessels is submitted to ICCAT each year.
2. For unauthorized vessels taking north Atlantic swordfish as bycatch only, these vessels would need to obtain approval for their level of bycatch, which must be included in the country's overall catch limit.

1.2.5.2.6 SMALL TUNAS

There are no ICCAT regulations in force for small tunas that are applicable to Grenada.

1.2.5.3 CAPACITY MANAGEMENT & REGISTRATION AND LICENSING

1. An active fisher and vessel registration and licensing system is in place. Annex 1 shows the registration and licensing forms and certificates in use.

2. A database is maintained of registered and licensed fishing vessels that includes information on: licence number; registration number; owner name and address, vessel name, mark and class; vessel status (local or foreign); port of registration; port of operation; vessel characteristics, including LOA, tonnage, and storage capacity; capacity for ice; crew number.
3. Tuna fishing vessels that are formally registered and licensed with the Fisheries Division have official authorization to fish for tuna and tuna-like species.
4. The number of tuna and tuna-like fishing vessels will be kept limited to the 2024 level of registration, as a first step towards establishing a limited entry fishery.

1.2.5.4 MONITORING CONTROL AND SURVEILLANCE (MCS)

1.2.5.4.1.1 Monitoring

1. A database on tuna fishery activities/ operations is managed to support review of performance of the present Tuna Fishery Plan, and which supports compliance with ICCAT data and information submission requirements. This is currently implemented by the following arrangements:
    - The Fisheries Division manages a vessel registry database that includes information on: licence number; registration number; owner name and address, vessel name, mark and class; vessel status (local or foreign); port of registration; port of operation; vessel characteristics, including LOA, tonnage, and storage capacity; capacity for ice; crew number.
    - The Fisheries Division has a paper-based system for monitoring fishing activity. A daily log form captures the following information: date, landing site, vessel name and registration number, crew size, area fished, trip duration, hours fishes, gear type and quantity, fishing depth data, weights of species caught and prices. Annex 2 contains a copy of the daily log form used. The daily form is filled out by the data collector, based on information on daily market operations.
    - A weekly tally of species catches is also estimated based on the daily log forms, and hand-written into a weekly fish landing log.
2. An observer programme and vessel monitoring system (VMS) plan are not in place due to limited resources. The minimum requirements for addressing these needs are provided in section 6, and consider alternative options that could make use of less resources.

1.2.5.4.1.2 Control of effort & authorisation to fish

1. The number of fishers and number of fishing vessels in the tuna fishery are being limited to the present level of fishing effort. New fishers and/or fishing vessels will be accommodated only when fishers and/or fishing vessels exit the fishery.
2. A fisher and vessel registration and licensing system is managed. Annex 1 shows the registration and licensing forms and certificates in use.
3. A database of registered and licensed fishing vessels is in place and provides a list of registered and licensed fishing vessels.
4. Tuna fishing vessels that are formally registered and licensed with the Fisheries Division have official authorisation to fish for tuna and tuna-like species.
5. Grenada has been involved in research exploring the impact of circle hooks on reducing unwanted bycatches of certain species, such as sea turtles and marlins. At present, the use of circle hooks remains voluntary.

1.2.5.4.1.3 Surveillance and enforcement

1. At-sea patrols are the sole option and remain dependent on Coastguard support and resources.
2. Measures to improve surveillance and enforcement system are proposed in section 6.

3. A few of the larger vessels are believed to be equipped with a VMS device, but this is not currently compulsory.

1.2.5.5 FISH AGGREGATING DEVICES

1. The fisherfolk organisations have direct responsibility for the maintenance of the aFADs, and for agreeing on the distribution of fishing effort opportunity arrangements within their fishing communities.

1.2.5.6 INDUSTRY, COMMERCE, AND CORPORATE SOCIAL RESPONSIBILITY

1. The sector undertakes measures to optimise the efficiency and effectiveness of the tuna value chain, and to minimize losses associated with poor quality control and handling of fish products along the value chain.
2. If not in place, the sector should establish policies for fulfilling international standards and goals regarding decent work and social protection. At present, GNExTT has in place a Social Grievance Policy that is intended to address any reported violations or concerns related to human rights and social responsibility standards.

1.2.6 DEVELOPMENT MEASURES

1.2.6.1 DEVELOPMENT OF MANAGEMENT SYSTEM

1.2.6.1.1 ADOPTION OF RELEVANT REGIONAL AND INTERNATIONAL INSTRUMENTS

Success of the Tuna Plan requires legally supported international cooperation. The government of Grenada, particularly the Ministries responsible for fisheries management and legal affairs, should therefore undertake the necessary review and evaluation of key regional instruments, e.g. aFAD regional management plan, and international agreements to which it is not yet a party, which could strengthen its position for international cooperation in tuna fishery management.

1. By 2025, Grenada should evaluate the benefits of becoming a party to relevant, international agreements, especially, The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and UN FAO Compliance Agreement: The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas.
2. By 2025, Grenada should evaluate the benefits of adopting the proposed aFAD regional management plan, and customise it for national application.

1.2.6.1.2 IMPROVED NATIONAL FRAMEWORK AND CAPACITY FOR OPTIMISED ICCAT COOPERATION

To optimise the benefits of cooperation with ICCAT, Grenada's Fisheries Division must strengthen its capacity to negotiate with ICCAT concerning its tuna fishery management and development needs. ICCAT represents a global negotiation forum for all aspects of fisheries management, which can impact other bilateral cooperation arrangements of direct interest to Grenada, such as international trade and international development projects. Consequently, it is imperative that the national framework and capacity for ICCAT cooperation, led by the Fisheries Division, engages and includes inputs routinely from those ministries responsible for foreign affairs, trade, economic planning, legal affairs, port management, national coastguard/ police service. The country's compliance record must also improve to support such negotiations. To address this need, the following measures are proposed and are expected to be led by the Fisheries Division, with support from companion ministries, as indicated above.

1. By October 2024, develop a position paper for Cabinet approval to expand ICCAT participation to include membership in Panels 1 and 4, which are the subsidiary bodies of the Commission that responsible for proposing management measures for the tropical tunas, and billfishes and small tunas respectively. The national delegation to ICCAT ideally should include representatives from, or obtain the required inputs and advice of ministries responsible for foreign affairs, trade, port management, national coastguard/ police service.
2. By December 2024, establish a National ICCAT Strategy.

3. By December 2024, establish a Working Group on ICCAT, as a subsidiary body of and reporting to the FAC, to oversee implementation of the National ICCAT Strategy.
4. By December 2024, establish a formal, annual schedule for fulfilling ICCAT reporting obligations, with assigned roles and responsibilities.
5. Annually, keep under review the performance of the present Tuna Fishery Plan, and make amendments to improve compliance with regional guidelines and international standards (e.g. ICCAT recommendations/ measures and minimum standards, and the MSC Standard) for responsible fisheries management.

1.2.6.1.3 DATA, INFORMATION AND RESEARCH

1. The Fisheries Division manages a fisher and vessel registry and licence system. This database includes information on: licence number; registration number; owner name and address, vessel name, mark and class; vessel status (local or foreign); port of registration; port of operation; vessel characteristics, including LOA, tonnage, and storage capacity; capacity for ice; crew number. During the period of this plan, Grenada should develop a proposal to phase out its paper-based data collection system, to be replaced by an electronic data collection system that will facilitate real-time monitoring. This will also ease the work burdens currently associated with the paper-based system, and preparation of statistical data for submission to ICCAT.
2. The Fisheries Division has a paper-based system with specific data forms for fisher and vessel registration and licensing (Annex 1), and for recording daily catches and trips by fishing vessels (daily log form – see Annex 2). The data forms, especially the fishing activity forms, will be kept under review to ensure that Grenada satisfies all the relevant ICCAT data needs to inform stock assessments and the generation of management advice, e.g. catch, including discards, catch-at-size, location (global positioning system coordinates) and date of capture.
3. During 2024 and going forward, cooperation arrangements with ICCAT and other RFBs will continue to be explored to encourage research on the tuna fishery of Grenada, which can be used to inform sustainable development and management decisions, consistent with the long-term management and development objectives of the present Tuna Fishery Plan.

1.2.6.1.4 MONITORING, CONTROL AND SURVEILLANCE

1. An observer programme is proposed to strengthen Grenada's contribution to data and research, and to deepen understanding about the nature of Grenada's tuna fishery for optimised, holistic management and development planning and decision-making. Annex 3 provides the elements of an essential observer plan for addressing ICCAT's minimum standards.
2. A vessel monitoring system (VMS) should be considered for at least the entire tuna longline fleet, to track vessel activity and movement, not only for safety at sea purposes, but to track trends in fishing activity distribution, and to collect data useful for detection of incidents of IUU fishing. Annex 4 provides the elements of the minimum standards of a VMS plan that would satisfy ICCAT's current requirements.
3. Consideration should be given to establishing arrangements to support implementation of ICCAT's recommended port State measures to prevent, deter and eliminate IUU fishing (ICCAT Recommendation 23-17[8] and the earlier Recommendation 18-09[9]). The relevant ICCAT recommendations contain a provision for developing states such as Grenada to seek technical and financial assistance from ICCAT to improve their capacity to implement port State measures. Related to this, ICCAT has established a special Monitoring, Control, and Surveillance Fund (MCSF) and procedures for the provision of assistance to

[8] ICCAT Recommendation 23-17, *Recommendation by ICCAT amending recommendation 18-09 on port State measures to prevent, deter and eliminate illegal, unreported and unregulated fishing* & ICCAT Recommendation 18-09, *Recommendation by ICCAT on Port State Measures to prevent, deter and eliminate illegal, unreported and unregulated fishing*

[9] ICCAT Recommendation 18-09, *Recommendation by ICCAT on port State measures to prevent, deter, and eliminate ilegal, unreported and unregulated fishing*.

developing member states of ICCAT for developing and implementing effective systems of port inspection, consistent with at least the ICCAT minimum standards (ICCAT Recommendation 14-08[10]).

4. A Fisheries Improvement Project (FIP) for the tuna longline, troll and dropline fishing operations is being undertaken to improve conformity of these operations with the internationally recognized MSC standard. In addressing requirements for improvements in data capture and product traceability along the value chain, one of the initiatives being undertaken in 2024 will explore development of an application programming interface (API) to facilitate data sharing between databases held by private sector groups, such as the GNExTT Cluster, and the database managed by the Fisheries Division. The initiative will include testing the use of an Android based App, so that Android phones could be used for more efficient vessel-based data capture activities, as well as applications aimed at satisfying ICCAT's product traceability requirements.
5. Consideration should be given to adoption of FAO's full Calipseo IT Solution for future use, as this system integrates fisheries data along the value chain and supports reporting to tuna-RFMOs like ICCAT.
6. Consideration should be given to options for improved surveillance activities at sea, through strengthening the working relations with the Coastguard/ police and exploring regional cooperation options, e.g. a CRFM collaboration arrangement with the Regional Security System (RSS).

1.2.6.1.5 ANCHORED FAD (AFAD) FISHERY MANAGEMENT

1. While ICCAT measures are focused predominantly on drifting FADs used by purse seine and baitboat vessels, Grenada will minimise the ecological impact of its anchored FADs. CRFM and WECAFC prepared a 5-volume series of manuals, which are applicable to the Grenada situation, and should be considered to guide management of FAD fishing operations.
2. Sub/ regional and regional aFAD fisheries management plans have been developed (CRFM 2015a, FAO in prep.), and a model logbook is available (CRFM 2015b). The regional aFAD management plan proposes several measures to address management and development objectives, which need to be customized to the Grenada situation.
3. By June 2025, the regional instruments noted at 1 and 2 should be reviewed and adapted to provide an approved national aFAD management plan.

1.2.6.2 INDUSTRY, COMMERCE, AND CORPORATE SOCIAL RESPONSIBILITY

1. National industry efforts are urged to evaluate their fishing methods and ensure adoption of fishing methods that minimise ecological risks, e.g. minimise/ eliminate unwanted bycatches, especially of endangered, threatened and protected species, and minimise damage to the marine habitats and ecosystems.
2. National industry efforts are encouraged to keep under review their value chain design for optimised benefits, with special attention given to minimising fish waste that leads to food loss, and continued cooperation with entrepreneurs for business development that explores alternative uses of inedible fish waste. There is already an initiative to commence this process, e.g. GrenadaGrows, a public-private partnership, is currently exploring the use of fish waste for production of animal feed and fertiliser. The performance of such initiatives will be kept under review.
3. Corporate entities are encouraged to prepare an annual report of their contributions to the performance of the present Tuna Fishery Plan, including their contributions to conservation and research, and sustainable development goals particularly in respect of decent work, social protection, and gender equity. Copies of applicable policies, and accompanying performance reports should be shared annually with the Fisheries Advisory Committee.

[10] ICCAT Recommendation 14-08, *Recommendation by ICCAT to support effective implementation of Recommendation 12-07 by ICCAT for an ICCAT scheme for minimum standards for inspection in port*.

1.2.7 CHAPTER BIBLIOGRAPHY

Anon. (1986). *Grenada Fisheries Act*. [Act No. 15 of 1986 amended by Act No. 25 of 1989, Act No. 1 of 1999.]

Anon. (2019). *Grenada National Ocean Policy*. Government of Grenada.

Anon. (2012). *A Fisheries and Aquaculture Policy for Grenada*. Fisheries Division, St. Georges, Grenada.

Anon. (2020). *Scoping Report and Workplan Fisheries Improvement Project for the Grenada EEZ pelagic longline, troll and dropline Atlantic Ocean yellowfin and bigeye fishery 2020 2023*. Internal Report.

CRFM, (2015a). Draft Sub–Regional Management Plan for FAD Fisheries in the Eastern Caribbean (Stakeholder Working Document). *CRFM Technical & Advisory Document* 2015/05. 94p.

CRFM, (2015b). *FAD Fishery Model Logbook*. CRFM Special Publication No. 4. 21p.

Finlay (2002) Fisheries Management and Development Plan. Fisheries Division, St. Georges, Grenada.

Eugène, S., Andrews, C., Dromer, C., Ishida, M. and Mohammed, E. (2015). Manual of Best Practices in Fisheries that use Moored Fish Aggregating Devices: Maintaining Good Quality of FAD–Caught Fish: From the point of capture to the point of sale. *CRFM Special Publication* No. 6, Vol. II. 21pp.

Finlay, J. (2002). *Grenada. Fisheries Management and Development Plan*. Fisheries Division, St. Georges, Grenada.

FAO. (2018). Fishery performance indicator studies for the commercial and recreational pelagic fleets of the Dominican Republic and Grenada, by Brad Gentner, Freddy Arocha, Chris Anderson, Keith Flett, Pablo Obregon and Raymon van Anrooy. *FAO Fisheries and Aquaculture Circular* No. 1162. Rome, Italy.

FAO (in prep.) *The Caribbean Regional Management Plan for the Anchored Fish Aggregating Device (aFAD) Fishery*. Western Central Atlantic Fishery Commission. Bridgetown.

Gentner, B., Arocha, F, Anderson, C., Flett, K., Obregon, P. & van Anrooy, R. (2018). *Fishery performance indicator studies for the commercial and recreational pelagic fleets of the Dominican Republic and Grenada*. FAO Fisheries and Aquaculture Circular No. 1162. Rome, FAO.

Gervain, P., Reynal, L., Defoe, J., Ishida, M. and Mohammed, E. (2015). *Manual of Best Practices in Fisheries that use Moored Fish Aggregating Devices: FAD Design, Construction and Deployment*. CRFM Special Publication No. 6. Vol. I. 55 pp.

ICCAT (2019). *Basic texts*. ICCAT, Madrid, Spain. https://www.iccat.int/en/index.asp

ICCAT (2024a). *Report for Biennial Period 2022-23, Part II (2023), Vol. 2, English Version*, SCRS. ICCAT, Madrid, Spain.

ICCAT (2024b) *Compendium. Management Recommendations and resolutions adopted by ICCAT for the conservation of Atlantic tunas and tuna-like species*. ICCAT, Madrid, Spain. https://www.iccat.int/en/RecRes.asp

Isaac, C. J. (2014). *National Report of Grenada*. In Report of Tenth Annual CRFM Scientific Meeting – Kingstown, St. Vincent & the Grenadines, 10-17 June 2014 - National Reports. *CRFM Fishery Report – 2014*. Volume 1, Suppl. 1. 48p.

Laurent, Y. (2021). *Calipseo Information System. An IT solution to integrate and streamline fisheries data along the national data supply chain*. Cited 15 August 2024. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.fao.org/fileadmin/user_upload/Wecafc/Calipseo_NFI-Seminar_17Nov2021_2.pdf

Le Roy, Y., Reynal, L. (2015). *Manual of Best Practices in Fisheries that use Moored Fish Aggregating Devices: Safety and working conditions onboard fishing vessels using FAD*. CRFM Special Publication No. 6. Vol. IV. 18 pp.

Rennie, J. (in press). *Historical Development of the Fisheries Over the Past two Decades*. CRFM Scientific Conference, in press, CRFM, Belize City, Belize.

Reynal, L., Mathieu, H., Dromer, C., Pau, C., Guyader, O. and Mohammed, E. (2015). *Fishing and Business Strategies for a Sustainable Anchored FAD Fishery*. CRFM Special Publication No. 6. Vol. III. 17p.

Sieben, S. and Gascoigne, J. (2012). Grenada Pelagic Longline, Troll and Dropline Atlantic Ocean Yellowfin and Bigeye Fishery. Marine Stewardship Council Pre-Assessment Report. *FAO Fisheries and Aquaculture Technical Paper* 673, Rome, FAO. https://doi.org/10.4060/cb5323en

Singh-Renton, S. in press. *Best Practices of Anchored Fad Fisheries Volume V – Anchored FAD Fisheries Governance with application to other Fisheries in the Wider Caribbean*. Western Central Atlantic Fishery Commission. Bridgetown.

1.2.8 CHAPTER ANNEXES

1.2.8.1 ANNEX 1 - FISHER AND VESSEL REGISTRATION AND LICENCE FORMS AND CERTIFICATES

Figure 1. Fisher registration application form

Grenada

Application for REGISTRATION OF FISHERS

For official use

Registration No. : _____

Last Name: _____ First Name: _____ Middle Name: _____

Address: _____ Village: _____

Nick Name : _____ Date of Birth: _____ Sex: _____

Phone No. : _____ Nationality_____

ID: National [ ] Social Security (NIS) [ ] Drivers License [ ]

Passport [ ] Other: [_____] ID Number: _____

Contact Information (Next In Kin)

Name: _____Phone No. : _____

Address: _____

Role in Fishery	Education	Qualification in Fishery
[ ] Registered Owner	[ ] Elementary	1. _____
[ ] Owner	[ ] "O" Level	2. _____
[ ] Captain	[ ] "A" Level	3. _____
[ ] Crew	[ ] Post Secondary	4. _____
[ ] Vendor	[ ] College/University	
other: _____		

Alternative Occupation : _____Operating Site : _____

Fisherman Cooperative Affiliation

1. _____
2. _____

None: [ ]

Time Working

[ ] Full Time
[ ] Part Time
[ ] Weekend Only
[ ] None

Marital Status: _____

No. of Dependants: _____

No. of Children: _____

No. of Girls: _____ No. of Boys: _____

Date of Application:

_____
(dd/mm/yy)

Date of Registration

_____
(dd/mm/yy)

Signature: _____ Approved by: _____ F.O.

Figure 2. A sample fishing vessel licence

SCHEDULE 5

LICENCE NUMBER: 1000

LOCAL FISHING VESSEL LICENCE
GRENADA
GRENADA FISHERIES ACT 1986

The person named as the licence holder below is hereby licensed in accordance with section 11 of the Grenada Fisheries Act 1986 to use the vessel described below for fishing in accordance with the conditions set out in this licence and prescribed from time to time in the Fisheries Regulations.

Name of vessel: Pure Grenada **Reg. No.:** J3-1100-CA

Name of licence holder: Justin Rennie

Reg. No. of licence holder: 500

Licence period: **From** 10/12/23 **to** 31/12/24

Radio call sign: Pure Grenada

Vessel Type: Launch **Dimension:** 38' **x** 10'

Permitted trans-shipment operations (where applicable): Not Permitted

Permitted use of fish aggregating devices (where applicable): Not Permitted

Special Conditions:

- The master / captain of the vessel must obtain permission from the Chief Fisheries Officer whenever he intends to enter a port of another jurisdiction other than Grenada.
- No fish shall be trans-shipped from or unto the vessel except with the permission of the Chief Fisheries Officer and the conditions sets out by him.
- The vessel shall display in a visible manner the identification markings assigned to it by the Chief Fisheries Officer.
- A log book shall be maintained by the captain on the daily operations of the vessels including itinerary, quantity and species of fish caught.
- The use of light sticks to target oceanic pelagic species is prohibited under this licence.

□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ .□ **Date:** December 11, 2023

Signature of the Chief Fisheries Officer

Figure 3. Vessel registration application form

GRENADA

REGISTRATION OF A VESSEL

The vessel herein named is hereby registered as a fishing vessel in accordance with section 11 of the Fisheries Act 1986.

Name of Vessel:	Pure Grenada	Registration No.:	1100
Port of Operations:	Carenage, St. George	Radio Call Sign:	F.V. Pure Grenada
Registered by: Fisheries Division (C. Bowen)		Vessel Markings:	J3-1100-CA

NAME	REGISTERED OWNER (S) ADDRESS	FISHER NUMBER
(NAME OF REGISTERED OWNER)	Melville Street, St. George	500

Vessel Type:	Launch	L.O.A.	38.0 ft
Material:	Fiberglass	B.O.A.	10.0 ft
Description:	White / Blue	Draught	
		Tonnage	

Fishery Type:	Surface Longline	Engines: Make and Type	H.P.
Storage Capacity:	5,000 lbs	1. Cummins	300
Ice:	T		
Number of Crew:	4		

Inspection Date:		Registration Date:	November 01, 2023
Inspected by:			

Signature _____ F.O. Date: November 01, 2023

Figure 4. Vessel registration and licence application form (revised)

SCHEDULE 4

GRENADA

APPLICATION FORM FOR A LOCAL FISHING VESSEL LICENCE

GRENADA FISHERIES REGULATIONS 1987

INSTRUCTIONS – Underline Surnames.
For "address" provide as much details as possible.
If not applicable, write NA – leave no blanks.
Specify units of measurement if not metric.

ADDRESS TO: The Chief Fisheries Officer, Ministry of Fisheries.

I hereby apply for a local fishing vessel licence for the vessel described below:

1. Name of vessel: _____
2. Name of owner: _____
   Address: _____
   Nationality: _____ Phone:_____
   D.O.B:_____ Registration No. _____
3. Name, address and registration number of any other person Having an interest in the vessel:
   _____
   _____
   _____
   _____
4. Vessel Registration No. _____ Licence No. : _____
5. International radio call sign (if any): _____
6. Name of master: _____
   Address: _____
   Nationality: _____ Phone: _____
   D.O.B: _____ Registration No. : _____
7. Nature of Fishing Operation to be undertaken:
   Fishery Type:
   I _____
   II _____
   III_____

   Species Targeted:
   I_____
   II_____
   III_____
8. Fishing Gear: Size Quantity
   I _____
   II_____
   III_____

9. Nature of vessel:

Vessel Type: _____

Material: _____

Description: _____

L.O.A.: _____ B.O.A. _____ Draught : _____ Tonnage : _____

Place Built: _____

Year Built: _____

History of Use: _____

Engines: Make and Type	H.P.	Serial Number
I _____	_____	_____
II _____	_____	_____

10. Number of crew expected:

Name:	Address:	Nationality:
I.	_____	
II.	_____	
III.	_____	
IV.	_____	
V.	_____	
VI.	_____	

11. Fish storage capacity for each storage method :

_____

12. Ice: Yes [ ] No [ ]

13. Operational Base: _____

14. Fishing Area: _____

15. Landing Site (s): _____

16. Concessions granted: _____

_____

I declare that the vessel described above is a local fishing vessel within the meaning of the Grenada Fisheries Act 1986.

I understand that I am required to report any changes in the information contained in this form to the Chief Fisheries Officer within 7 days of the change.

Signature of Applicant: _____ Date: _____

Specify whether owner or charterer: _____

Print name of Applicant: _____

Date of Inspection: _____ Expiry: _____Licence Expiry: _____

Approved by: _____ F.O. Date: _____

Note: Any licence issued on the basis of this application form is liable to cancellation if any of the information given in this application form is incorrect.

1.2.8.2 ANNEX 2 - DAILY FISH LANDING LOG

FISHERIES DIVISION - GRENADA																								
DAILY FISH LANDING LOG																								
LOCATION:			**LANDING STIE:**						**TIME OF DATA COLLECTION:**								**START:**				**END:**			
DATA COLLECTOR:									**INTERVIEW DATE:**															
Boat Name:																								
Reg. No.																								
Boat Length:																								
Crew Size:																								
Area Fished:																								
Days Out/ Days Fished:																								
Hours Fished:																								
Type of Gear Used:																								
Quantity of Gear:																								
Min. Depth / Max. Depth:																								
Why Fishing was Terminated:																								
Species	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.	Qty (lbs)	Ws. Pr.
TOTAL																								
COMMENTS:																								

P.T.O.

1.2.8.3 ANNEX 3 - OBSERVER PLAN[11]

Prefatory note – During the 1980s-1990s, Grenada had an observer programme, aimed at monitoring the activities of foreign fishing vessels in Grenadian fishery waters. The costs of the programme were covered under a Royalty fee system. A similar fee system may need to be considered to support a national observer programme that deploys human observers.

Objectives:

1. To fulfil obligations in meeting the ICCAT minimum standards for observer programmes.

2. To contribute to improved scientific information on Grenada's tuna fishery

Fleet participation: The plan applies to the tuna longline fleet.

Required measures (adapted from ICCAT Recommendation 16-14):

1. Minimum criteria of observers - Observers must satisfy the following minimum criteria.

i. Sufficient knowledge and experience to identify ICCAT species and fishing gear configurations.
ii. Ability to observe and record accurately the information to be collected under the programme.
iii. Capability to perform the observer tasks noted at 6.
iv. Ability to collect biological samples.
v. Minimum and acceptable training in safety and survival at sea.
vi. Are not crew members of any tuna longline fishing vessels.
vii. Do not have family or financial relations or interests with any tuna longline fishing vessel operators.

2. Obligations of the observer – The observer is obliged:

i. Not to interfere with the vessel's electronic equipment, or with fishing activities, or with normal vessel operations.
ii. To communicate in a timely fashion with the master/ captain about the relevant observer issues and tasks.
iii. To be familiar with emergency procedures and location of emergency and safety equipment.
iv. To attend a debriefing session following every observer mission.

3. Obligations of the master/ captain – The master/ captain is obliged:

i. To provide reasonable accommodation, food, health care, medical supplies, and a safe working environment.
ii. To facilitate the observer's tasks
iii. To permit appropriate access to the vessel and its operations, electronics and other equipment relevant to the observer's tasks.
iv. To protect the observer from acts of intimidation, harassment, violence and bribery, attempted violence and attempted bribery, as well as acts that may interfere with or prevent the execution of observer duties.
v. To protect the observer's equipment from acts of tampering and destruction.

4. Observer coverage - Ensure a minimum of 5% observer coverage for the fishing effort of the tuna longline fleet, measured in fishing days, number of sets or number of trips. Such coverage must also be representative of the temporal and spatial distribution of fishing effort. In view of this, data on the temporal and spatial spread of fishing effort will be examined annually, to inform preparation of annual observer programme

[11] The plan is aligned to comply with the minimum standards recommended by ICCAT (ICCAT Rec 16-14, *Recommendation by ICCAT to establish minimum standards for fishing vessel scientific observer programmes*)

schedules, which provide the 5% representative coverage of fishing effort over the fleet, and through space and time.

5. Electronic monitoring system (EMS) - For longline vessels unable to accommodate a human observer (< 15 m LOA), an alternative, acceptable form of independent electronic monitoring will be applied to collect the required scientific data. A description of the technology and methodology will be made available to the SCRS for its endorsement, and subsequent recommendation to the ICCAT Commission for approval.

Additionally, Grenada will monitor and document the performance of any applied alternative electronic system to replace human observers, and share its findings with the ICCAT SCRS. Grenada will keep under review technology developments, including use of Artificial Intelligence, and the experiences shared by other countries, to inform further development and expansion of its observer programme and/ or EMS.

The adopted EMS will meet at least the minimum standards and programme requirements as recommended by ICCAT (Recommendation 23-18[12]).

6. Observer Tasks – These tasks may include one or more of the following:

i. Record catches, i.e. target catch, discards, bycatches of sharks, sea turtles, marine mammals and seabirds.
ii. Collect biological samples, as requested, e.g. gonads, otoliths, spines, scales.
iii. For live releases, record general condition of released animals related to survival rates, i.e. dead/ alive and active, wounded, etc.
iv. Collect and report any fish tags, and collect data on the tagged fish, including taking photographs.
v. Record fishing operation, i.e. GPS coordinates of areas fished, number of fishing sets/ hooks, dates and times of fishing operations and catches, use of FADs, use of natural floating objects.
vi. Record the use of mitigation measures to avoid catches of unwanted catches, especially endangered, threatened, and protected species.
vii. Record environmental conditions during fishing, e.g. sea state, weather, etc.

Evaluation and reporting:

1. The Fisheries Division will include the following details of its observer programme in its annual national report to ICCAT: the target level of observer coverage, and how it was determined based on the characteristics of the tuna longline fleet, and the spatial and temporal distribution of fishing effort; data collected; and implementation protocols, e.g. handling of catch, measurement procedures, etc. Any changes in the observer programme over time will be captured in the annual national report to ICCAT.

2. Annually, the Fisheries Division will use the designated electronic formats that are developed by the SCRS to report the observer data to the SCRS, as required.

3. The Fisheries Division will keep under review the efficiency and effectiveness of the performance of its observer programme, and prepare an annual report for informing any required adjustments to the plan and in tuna fishery management measures. This report should be accessible to the FAC and all sector stakeholders to accommodate their engagement in the management decision-making process.

Technical Assistance to support the plan:

ICCAT Recommendation 16-14[13] contains provisions for developing states such as Grenada to seek technical assistance from ICCAT concerning its special requirements for building capacity to achieve the minimum standards for successful implementation of a scientific observer programme.

---

[12] ICCAT Recommendation 23-18, *Recommendation by ICCAT to establish minimum standards and programme requirements for the use of electronic monitoring systems (EMS) in ICCAT fisheries*.

[13] ICCAT Rec 16-14, *Recommendation by ICCAT to establish minimum standards for fishing vessel scientific observer programmes.*

1.2.8.4 ANNEX 4 - VESSEL MONITORING SYSTEM (VMS) PLAN[14]

Objective: To implement ICCAT's recommended minimum standards for a vessel monitoring system (VMS), which facilitates 'real time' reporting of data on fishing vessel activity and hence supports monitoring, control and surveillance operations that require timely responses.

Fleet participation: In the first instance, the plan applies to the tuna longline fleet, and is compulsory for tuna fishing vessels that are 15 m LOA or greater.

Required measures:

1. Fishing vessels are to be equipped on board with an autonomous, tamper-evident satellite-tracking device that continuously, automatically, and independent of any intervention by the vessel, transmits messages to a system authorised to receive data concerning the position, course, and speed of a fishing vessel.

2. Fishing vessel owners and masters/ captains are to ensure that the satellite tracking device fitted on board the fishing vessel collects and transmits continuously the following data, at least every 2 hours, to a receiving system authorised by the Fisheries Division:

i. the vessel's identification (registration number);

ii. the geographical position of the vessel (longitude, latitude) with a margin of error lower than 500 meters, a confidence interval of 99%; and

iii. the date and time.

3. The Fisheries Division should access the data and maintain a record of interruptions in the transmission of VMS data, to inform follow up investigations on any suspicious activities and application of relevant punitive actions in accordance with the relevant provisions of the Fisheries Act.

4. In the case of foreign fishing vessels, arrangements will be made with the relevant flag states for automatic transmission and receipt of vessel position messages while such vessels are operating in Grenada's fishery waters. Grenada Fisheries Division will notify the relevant flag state of any interruptions in the reception of consecutive position messages.

5. In addition, vessel operators will ensure that:

i. the satellite tracking device is not tampered with in any way;
ii. VMS data are not altered in any way;
iii. the antennae connected to the satellite tracking device are not obstructed in any way;
iv. the satellite tracking device is hardwired into the fishing vessel and the power supply is not intentionally interrupted in any way; and
v. the satellite tracking device is not removed from the vessel except for the purposes of repair or replacement.

6. If a satellite tracking device is found to be defective, the fishing vessel will seek to repair or replace the device as soon as possible, and certainly within a month if the repairs can be done locally. If the repair/ replacement period must exceed 1 month, the vessel owner/ master will submit a request to the Chief Fisheries Officer seeking permission for an extension. The maximum extension time granted will be limited to 2 months.

7. A fishing vessel with a defective satellite tracking device shall communicate with the Fisheries Division and/or Coastguard, at least daily, providing the information contained in paragraph 2 by other means of communication (radio, web-based reporting, electronic mail, telefax or telex). A separate record of the vessel's

[14] The plan is aligned for compliance with the minimum standards recommended by ICCAT (ICCAT Rec 18-10, *Recommendation by ICCAT concerning minimum standards for vessel monitoring systems in the ICCAT Convention Area*).

position every 2 hours will be kept by the vessel's master/ captain until the satellite tracking device's functionality is restored.

8. A vessel is allowed to power down its satellite tracking device only if the vessel will not be fishing for an extended period of time (e.g., in dry dock for repairs), and must notify the Chief Fisheries Officer of this status. The satellite tracking device must be re-activated, and collect and transmit at least one report, prior to the vessel leaving port.

Surveillance and enforcement:

1. An inter-ministerial arrangement among the ministries responsible for fisheries matters, national security, maritime security and law enforcement, is proposed to serve as a Fisheries Surveillance and Enforcement Sub-Committee. It is anticipated that the Fisheries Surveillance and Enforcement Sub-Committee will report to the FAC.

2. The Fisheries Surveillance and Enforcement Committee shall be responsible for overseeing the implementation of this plan, including keeping under review approaches to fisheries surveillance and enforcement, and guiding legal actions necessary for instances of persistent non-compliance.

Monitoring, evaluation, and reporting:

1. The Fisheries Division will maintain a VMS database, and share these data with the ICCAT SCRS, as required.

2. The Fisheries Division will prepare monthly VMS implementation reports. The reports shall be supported by data and maps on vessel activity and movement for each month and will identify incidents of non-compliance.

3. The Fisheries Division will keep under review the efficiency and effectiveness of the performance of its VMS plan, and prepare an annual report for informing any required adjustments to the VMS plan. This report will be accessible to the FAC and all sector stakeholders to accommodate their engagement in the relevant decision-making process.

2 NATIONAL ICCAT STRATEGY FOR GRENADA WITH ASSESSMENTS

Citation:

CH Business Consulting (2024). *National ICCAT Strategy for Grenada with Assessments* Portugal, CH Business Consulting.

Chapter 1 was prepared by Susan Singh-Renton.
Chapter 2 was prepared by Joseph Powers

EXECUTIVE SUMMARY

Tuna and tuna-like fish species are highly migratory, spanning vast ocean areas. Management of these shared resources requires international cooperation. The International Commission for Conservation of Atlantic Tunas (ICCAT) is the regional fisheries management organization responsible for ensuring sustainable management of tuna and tuna-like species within the Atlantic Ocean and its adjacent Seas, including the Caribbean Sea.

Grenada's fisheries target a range of resources. However, the country's large pelagic fishery is the most important fishery, contributing to 73% of reported landings. Fresh tuna exports comprised 18% of the total value of exported goods from Grenada in 2016. The trend in importance has continued, with fish exports contributing to 40% of the total fish production value in 2023. Throughout the years, especially following the introduction of longline gear in 1979, public and private sector investments in the large pelagic fishery have steadily increased. Investments have included several fishery development projects, the introduction of various sizes of longline vessels, the developing use of anchored fish aggregating devices, membership in ICCAT, and cooperation with regional fisheries bodies. These investments have established certain successes for the tuna fishery. Membership in ICCAT is a critical step for safeguarding the growing investments in Grenada's tuna fishery. To maximise the benefits of such membership, Grenada would have to demonstrate its commitment to the ICCAT process at both the science and management levels.

The present strategy proposes an informed, comprehensive approach that allows Grenada to fulfil its obligations as a member of ICCAT, while also enabling Grenada to obtain support for its tuna development interests, and to enjoy improved, overall sustainable tuna fishery performance. The strategy's vision recognizes the value of optimised use of knowledge and stakeholder inputs for effective ICCAT participation that allows Grenada to protect existing social and economic benefits derived from the tuna fishery, and to realise further sustainable development and equitable distribution of the benefits across the stakeholder landscape. Several issues impact current ICCAT participation, with the root cause being the state of the national enabling environment. Four key components of the national enabling environment are identified for attention, included as the following strategic priorities:

- **Strategic Priority 1** – Effective management and usage of evidence base;
- **Strategic Priority 2** – Effective, equitable stakeholder participation;
- **Strategic Priority 3 –** Active, adaptive national tuna fishery policy/ management cycle;
- **Strategic Priority 4** – National holistic approach for policy coherence.

Under Strategic Priority 1, the strategy proposes digitalisation of Fisheries Division data and information management activities for the tuna fishery, facilitating 'real-time' collection and storage of data, 'real-time' national-level reporting commitments to ICCAT, and 'real-time' inter-ministerial collaboration on data sharing, analysis and reporting. The shift towards a digitalised system will require capacity building for management and use of the system both by the public and private sectors. Other key actions aim to improve: the usage of data and information by both public and private sectors, and broadening the evidence base to address the full suite of social, economic and environmental objectives, via expanded data collection and research activities.

Under Strategic Priority 2, the strategy proposes the establishment of an ICCAT Working Group (ICCAT WG) as a subsidiary body of the national Fisheries Advisory Committee. The strategy recognises that community and vulnerable stakeholder groups involved in the fishery will likely require support to increase their skills and capacities for organised representation and participation at tuna fishery meetings. In addition to strengthening the organisation and representation of all tuna fishery groups, the strategy proposes that tuna fishery stakeholders be formally educated about ICCAT and tuna fishery management issues for improved understanding of the issues at stake. In addition, quality of stakeholder participation, for ensuring industry practices that promote holistic sustainable development, is addressed.

Under Strategic Priority 3, the strategy aims to revive the national Fisheries Advisory Committee (FAC). There is consideration of new membership and functions for the FAC. Re-established FAC arrangements should ensure good governance, the capacity to establish technical working groups, such as the ICCAT WG proposed under

Strategic Priority 2, and the need for an active, time-based fisheries policy/ management cycle, with a special policy/management cycle for the tuna fishery. The arrangement facilitates the ICCAT WG leading the coordination of the tuna policy/ management cycle, to be supported by a 5-year tuna fishery management and development plan and a Monitoring, Control and Surveillance (MCS) system that can meet ICCAT cooperation demands.

Under Strategic Priority 4, the strategy aims to promote the establishment of an inter-ministerial coordination mechanism for improved coherence of fisheries policy decisions with those of other national sectors. By this means also, the fisheries sector can achieve synergies to boost results for the sector's ongoing social and economic development and associated benefits. At present, the FAC has some capacity to achieve inter-ministerial coordination, and actions are proposed to support this. Actions include capacity building for the ICCAT WG and the FAC in team leadership and management, and strengthening understanding of fisheries management science. Additionally, the FAC is expected to provide guidance on sustainable industry practices for achieving social and economic goals embodied in the 2030 Agenda for Sustainable Development.

Both the public and private sector have key roles and responsibilities that are identified for ensuring good governance practices and proactive, effective ICCAT participation. Additionally, to support implementation of the strategy, some options for international donor sponsorship are identified.

Additional goals for this project were 1) to complete a risk assessment of current tuna fishing practices to ensure target and other species within the marine ecosystem are protected and develop harvest control rules that reflect the risks and 2) to evaluate likely bait usage in the Grenada longline fishery and also regional bait usage in the longline fisheries for tuna and tuna-like species. Risks of current tuna fishing practices of Grenada were evaluated by reviewing the status of the ICCAT stocks that Grenada catches: whether stock-wide overfishing is occurring or not or whether the stock is or is not currently overfished. Also, the status of development of ICCAT harvest control rules (HCRs) was reviewed. No HCRs have been developed as of yet for the marlins, western Atlantic sailfish, yellowfin and bigeye; whereas the HCRs for western Atlantic skipjack, northern Atlantic Albacore and northern Atlantic swordfish have HCRs that are fully implemented or are awaiting final adoption. It is likely that further regulatory actions will be taken in the future to address Atlantic yellowfin and Atlantic bigeye by ICCAT. Grenada should be prepared for those eventualities. Additionally, Grenada's reported landings of the marlins and sailfish are a relatively high proportion of the stock-wide ICCAT-agreed catch limit. Thus these catches may be inhibiting recovery of these stocks from their overfished status. Further evaluations of non-tuna species were conducted by updating previous productivity-susceptibility analyses (a risk-based framework).

Bait usage in the longline fisheries of Grenada and of other regional longline fisheries were inferred from estimated kg of yellowfin per longline hook (derived from previous studies), then expanded to total annual catch of yellowfin currently occurring in the regional longline fisheries. This provides an estimate of number of hooks fished per year. This, in turn, was expanded into bait usage (mt per year) by multiplying by the average weight of the bait used on each hook. No information was available to parse the usage into the three common bait species: flyingfish, bigeye scad and threadfin herring. However, anecdotal information has consistently indicated that the proportion of usage that is flyingfish has declined in recent years. Additionally, a stock-assessment of regional flying fish conducted in 2008 was reexamined in this report. Results indicate that it is unlikely that current catches have exceeded the recommendation of 2008 for a precautionary catch limit of approximately 5000 mt annually.

2.1 ICCAT NATIONAL STRATEGY

2.1.1 INTRODUCTION

2.1.1.1 INTERNATIONAL COOPERATION AND THE ROLE OF THE INTERNATIONAL COMMISSION FOR CONSERVATION OF ATLANTIC TUNAS (ICCAT)

Tuna and tuna-like fishes are large fish species that inhabit the pelagic zone (open water) of many of the world's oceans. Some species have been shown to be highly migratory, with fish stock distributions extending over vast areas of ocean (ICCAT, 2024), crossing multiple national maritime boundaries and including the High Seas. The successful, responsible management of these extensive fish stock units is possible only through effective international cooperation. Several voluntary and binding international fisheries instruments and conventions have been developed to guide the required cooperation for shared fishery resources, e.g. the UN Fish Stocks Agreement[15], the FAO Compliance Agreement[16].

As expected, the UN Fish Stocks Agreement gives special attention to the rights and duties of States regarding mechanisms of multilateral cooperation, acknowledging that some regional arrangements or organisations are already in place. It is important to note that the UN Fish Stocks Agreement lists criteria for determining the nature and extent of new members or participants of regional arrangements or organisations, e.g. current stock status and existing fishing effort levels, conservation and management contributions, interests of developing states from the sub-region/ region (Article 11). To access the shared resources, States are expected to be members of, or to participate in, these regional cooperation arrangements or organisations, or to agree to comply with their agreed measures (Article 8, paragraph 4). In the absence of direct participation, States are still obliged to cooperate in the conservation and management of the relevant fish stocks concerned (Article 17, paragraph 1).

The International Commission for Conservation of Atlantic Tunas (ICCAT)[17] is the regional fisheries management organisation with the mandate to coordinate management of Atlantic tunas and tuna-like fish stocks. ICCAT was established by the International Convention for Conservation of Atlantic Tunas that was opened for signature in May 1966 (ICCAT, 2019a). The ICCAT Convention covers the Atlantic Ocean and adjacent Seas, including the Caribbean Sea. The principal objective of the ICCAT Convention is to support international cooperation for maintaining populations of tuna and tuna-like fish stocks within the Convention Area at levels which will permit the maximum sustainable catch for food and other purposes.

2.1.1.2 GRENADA'S TUNA FISHERY – NATIONAL CONTEXT AND IMPORTANCE, ONGOING DEVELOPMENT, INVESTMENT, AND SUCCESS EXPECTATIONS

Grenada has a coastline of 121 km, with inshore fishing areas estimated at 1 902 km^2 (CRFM, 2021), and a continental shelf area of 3 100 km^2. The Exclusive Economic Zone has not been formally delimited (Rennie, in prep.). Three main types of fisheries are practiced and use a variety of gears (Isaac, 2014). Reef and demersal fisheries typically use trap and scuba gear to target reef fishes and shellfish resources. Small coastal pelagic fisheries use seine nets to catch species such as scads (Carangidae), and offshore pelagic fisheries use longline and other configurations of hook and line gear to catch a range of tunas and tuna-like species (op. cit.). The fisheries sector is considered valuable for its contribution to a range of national objectives, especially food and nutrition security, employment and income generation, foreign exchange earnings and savings, sustainable livelihoods, and poverty alleviation (Rennie, in prep.). Reef and small, coastal pelagic resources have traditionally been preferred for local consumption, but recent apparent declines in these resources have caused

[15] *The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA)*. [Entered into force on 11 December 2001]

[16] *Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas*. [Entered into force on 24 April 2003]

[17] https://www.iccat.int/en/

a shift in local consumption patterns, with increasing consumption of certain offshore pelagic species, particularly dolphinfish, king mackerel and wahoo (Gentner *et al*. 2018).

The large pelagic fishery is the most important fishery, both in terms of landings and value. Mangi and Townhill (2019) noted that large pelagic fish landings contributed to 73% of total fish landings, with reef fish being second in importance, contributing 18% of total landings; the remainder of landings was composed of small pelagic fish resources (7%), and shellfish resources (2%). These estimated percentages are based on available official data, but Mangi and Townhill (2019) pointed out that only about 75% of vessels are registered, and landings were recorded only at the main markets. They noted that landings from inshore fishing operations, which do not use the main markets and were mostly harvesting reef and small coastal pelagic fishes, were under-reported (op. cit.). On the other hand, the data records were considered reasonable for those resources destined for export, such as tunas, lobster and conch.

In terms of monetary value, Rennie (in prep.) indicated that both fish production and fish exports increased in the past twenty years (2003-2023), by over 50% and 37% respectively. Added to this, fresh tuna exports comprised 18% of the total value of exported goods from Grenada in 2016 (Gentner *et al.* 2018), highlighting the high level of importance of this resource for foreign exchange earnings. In 2023, national fish production was estimated to have a value of XCD 40 million. A total of 636 t of fish were exported, with an estimated value of XCD 16 million or 40% of the total fish production value (Rennie, in prep.). These data reaffirm the valuable contribution of the seafood export industry to Grenada.

The introduction of longline technology in 1979 (Rennie, in prep.), together with government efforts during 1980-2000 to commercialise fishing operations and marketing, stimulated private sector investments in the large pelagic fishery. Additionally, in view of its location in the southeast Caribbean and just north of the South American continent, the Caribbean current and productive Amazon waters flowing along the northeast tip of South America are believed to bring migrating tunas and tuna-like fish resources close to Grenada's coasts and within easy reach of coastal fishing operations. Upwelling conditions in the southern Caribbean, just north of Venezuela, may also help to keep tunas and tuna-like fishes at shallower depths, compared to more northern areas of the Caribbean. The use of anchored fish aggregating devices (aFADs) was made popular in 2012, with the support of a regional fisheries co-management project [18] focused on promoting pelagic resource development and a community-based co-management approach (CRFM, 2017).

There are four types of fishing vessels that participate in Grenada's large pelagic fishery. There are three types of longliners, categorised according to: size (Type I - 4.5-7m LOA, Type II - 7.3 to 8.8.m LOA, and Type III - 9.7 to 16m LOA), with corresponding varying levels of gear capacity (Type I - 50 hooks, Type II – over 200 hooks, Type III – over 400 hooks); cold storage capacity (Type I - day boat with no ice-box, Type II - ice box, Type III - greater cold storage capacity); engine capacity (Types I & II - outboard motors, versus inboard diesel engine used by Type III longliners); and, length of fishing trips (Type I - day boats, Type II - 2-day trips, Type III - multi-day trips). The fourth type of fishing vessel is an open-decked wooden or fibreglass pirogue, which uses troll and/ or drop lines. In 2014, there were reportedly 210, 120 and 75 of Types I, II and III longliners respectively in operation, and 250 open pirogues with capacity for using hook and line gear (Isaac 2014). By 2018, the number of active Types I and II longliners had reduced to 65, while the number of active Type III longliners had increased to 127 (Gentner *et al.*, 2018), suggesting an ongoing growth of private sector investment in larger fishing vessels.

Grenada currently operates an open access arrangement for all its fisheries, which could encourage continued new entrants into the large pelagic fishery. While some additional increases in fishing effort may be possible, the natural limitation of the fish resource base should be appreciated and be determined for informing fishing effort investments and sustaining these investments at a level that protects the quality of livelihoods currently enjoyed by sector participants. Not surprisingly, large pelagic fishers, both from the longline and aFAD fisheries, have indicated a willingness to support a limited entry arrangement (Gentner *et al.*, 2018).

In view of the value of the sector's contribution to national objectives, the increasing private sector investment in the large pelagic fishery and the tuna fishery's significant contribution to export revenue, both government

[18] Caribbean Fisheries Co-management Project (see CRFM 2017)

and private sector expectations are high for maintaining the successes achieved, and for expanding benefits through improved value chain design for product quality and diversification, and conversion of inedible waste material into alternative, commercial products.

Grenada's decision to become a member of ICCAT, and its cooperation efforts with regional fisheries bodies such as the CRFM and WECAFC, which have been addressing common fisheries management challenges and which both have relations with ICCAT, would also raise public and private investor expectations. For example, both CRFM and WECAFC have active working groups and/ or projects that have supported countries to improve cooperation with ICCAT, and to improve management of aFAD fisheries; in some instances, countries established dedicated aFAD working groups (e.g. CRFM, 2015; CRFM, 2017; Singh-Renton, in prep.). In the 1990s, Grenada participated regularly in the *ICCAT Enhanced Research Program for Billfish* through conduct of shore-based sampling of billfish landings from the artisanal and recreational fisheries (e.g. ICCAT, 1996; ICCAT, 2000), but this formal cooperation was eventually discontinued due to apparent, decreased ability to continue sampling for the ICCAT Programme.

2.1.1.3 Grenada's potential power and impact as a stakeholder in Atlantic tuna fisheries

As already noted, membership in ICCAT is essential to safeguard Grenada's continued investment in its Atlantic tuna and tuna-like fishery. In view of ICCAT's mandate of conservation and management measures for Atlantic tuna and tuna-like species, Grenada's cooperation with ICCAT, that is, submission of required data and compliance with adopted measures, would be a minimum requirement of international law for continued tuna fishery participation. That noted, the membership status allows Grenada to participate more actively in ICCAT's work, from data contribution to engaging in deliberations and decisions about stock status and agreed conservation and management measures. Such active participation would ensure that Grenada's tuna fishery interests are suitably considered in ICCAT's tuna fishery management decisions.

To achieve the full benefits of ICCAT membership, Grenada would have to fulfil its reporting obligations to ICCAT, and develop negotiating positions to inform national interventions during ICCAT meetings where key decisions on country quotas and species regulations are being made. It is also necessary to maintain a reliable, quantitative evidence base on Grenada's tuna fishery, which can provide undisputed proof of the nature and extent of social and economic dependence on the fishery, and how the fishery contributes to related national objectives. It is recommended to have in place a tuna fishery management and development plan, with agreed objectives and measures to inform negotiating positions, and to foster ICCAT's appreciation of the special interests, as well as the challenges, of Grenada as a Small Island Developing State. Moreover, increasing Grenada's participation in ICCAT and being an actively contributing member will earn Grenada an improved overall global profile in responsible fisheries management. While strengthening the tuna fishery evidence base will ensure primarily that the tuna fishery interests can be defended at ICCAT, a strengthened tuna fishery evidence base will enable Grenada to fulfil performance accountability for other essential demands, e.g. accountability of the sector's contribution to national objectives, and to the agreed United Nations' Sustainable Development Goals[19].

2.1.2 Mission

2.1.2.1 What the strategy achieves

Participation in ICCAT is essential to guarantee Grenada's stake in a natural renewable, ocean resource, tuna and tuna-like fishes, to support a national, commercial scale industry that can participate in reputable, international trade. Moreover, as ICCAT is an international forum with members from across the globe, effective participation in ICCAT would elevate Grenada's international profile as a State that conducts responsible fisheries management, which can yield added benefits for Grenada in dealing with the international community.

2.1.2.2 Who the strategy serves

[19] https://sdgs.un.org/goals

An effective strategy on ICCAT serves primarily the tuna fishery stakeholders, as it will safeguard both public and private sector investments, associated livelihoods and government revenue. Tuna fishery stakeholders include: foreign and local investors alike, tuna processors, tuna export companies, all fishers of tuna and tuna-like species (longline, troll and dropline, recreational fisheries), and the government of Grenada. Companies in importing countries also benefit, as their business arrangements with Grenada's export companies enjoy protection.

The State of Grenada also benefits from an overall, enhanced international profile, which can be used to strengthen Grenada's negotiating position in defending its interests at regional and international fisheries and related management fora, as well as other international fora dealing with important economic development issues, e.g. World Trade Organisation and its fisheries subsidies agreement[20] (WTO, 2022). The enhanced responsible fisheries management profile is also valuable for attracting increased technical and financial support from international development partners.

2.1.2.3 WHAT DRIVES THE STRATEGY TO MAKE IT EFFECTIVE

The ICCAT strategy incorporates an informed multiple objective approach, that considers the needs of all tuna fishery stakeholder groups alongside the special interests of Grenada as a developing State. The multiple objective approach guarantees continued, focused, contribution by the fisheries sector to multiple national objectives, incorporating considerations for employment and decent work for a range of societal groups that guarantees sustainable livelihoods for poverty alleviation, national food and nutrition security, foreign earnings from international trade, and recreational/ sport fishing revenue for the tourism sector. The strategy improves the evidence base for accountability of the sector's contributions to national objectives, and by this means, also to international sustainable development goals[21] in terms of delivering the desired balance of social, economic and environmental outcomes.

2.1.2.4 MISSION STATEMENT

In summary, the strategy's mission is "*To pursue an informed, comprehensive approach, aligned with ICCAT requirements for management of tuna and tuna-like fishery resources for protection of Grenada's rights to fish for tuna and tuna-like species, for fulfilment of Grenada's tuna fishery management and development objectives, and for improved accountability regarding international sustainable development goals*."

2.1.3 VISION

2.1.3.1 DESIRED IMPACT OF STRATEGY (WHAT IMPACT, FOR WHOM, AND WHY)

The tuna fishery already delivers multiple social and economic benefits. The strategy ensures that this benefit potential is protected and sustainably developed within the limitations of the natural resource base, and optimised in a manner to allow benefits to be distributed equitably across the stakeholder landscape. By this means also, social and economic needs are guaranteed for present and future generations.

2.1.3.2 WHAT TO CHANGE

The strategy seeks to improve the national enabling environment for ICCAT cooperation and participation. Major areas of the enabling environment are linked and require strengthening.

5. Evidence base management for ICCAT participation, usage and accessibility, particularly:
    a) National tuna fishery information development for improved understanding of the fishery's characteristics and trends, social and economic contributions, potential for further development and diversification;

[20] https://www.wto.org/english/tratop_e/rulesneg_e/fish_e/fish_e.htm

[21] https://sdgs.un.org/goals

b) National statistics and research efforts that improve understanding of national fishery status, while also contributing to ICCAT's scientific work;

c) Fulfilment of basic, annual ICCAT statistical and reporting obligations;

d) Development of evidence-based and hence easily supported national positions for effective participation in ICCAT's scientific work and management deliberations.

6. Equitable stakeholder participation for ICCAT-related decisions that address stakeholder needs fairly and that enjoy wide support, particularly:

   a) Revival of the national Fisheries Advisory Committee (FAC), and its capacity to represent stakeholder groups' interests fairly in the government commitment mechanism.

   b) Strengthening tuna fishery co-management, supported by effective stakeholder and public outreach and education and improved organisation and management of stakeholder groups for informed participation.

7. A proactive, government/ ministry-led mechanism for evidence-based, timely policy and management responses, aligned with the annual ICCAT management cycle:

   a) A formal, distinct tuna fishery policy/ management cycle, that involves strategic planning, data collection and analysis, review and evaluation, consultation and negotiation, and evidence-based adjustment of policy and management decisions.

   b) National monitoring, control and surveillance (MCS) system and information that guarantees protection for national legal fishing operations, and actively contributes to Grenada's ICCAT compliance record;

8. A 'whole-of-government' approach for balanced, sustainable outcomes, that make the best use of ICCAT participation particularly:

   a) Inter-ministerial coordination for information sharing and processing to evaluate and inform national positions regarding ICCAT cooperation.

   b) Inter-ministerial cooperation for policy coherence and hence a holistic approach to addressing multiple objectives, particularly considering ongoing challenges of climate change, social protection, gender equity and other human rights issues, and multiple sector participation in the blue economy.

   c) Policy reforms to facilitate private sector and foreign direct investment, as needed, in new and improved tuna value chains.

2.1.3.3 HOW TO MAKE THE CHANGE

The strategy promotes a culture of partnership (co-management) primarily among public and private sector stakeholder groups of the national tuna fishery, and between Grenada and ICCAT. The proposed partnerships should be beneficial to all parties. For effective partnership among public and private sector stakeholders, the strategy promotes a culture of knowledge-strong strategic planning, alongside representative stakeholder participation/ inclusion and cooperation in the partnership arrangement.

Strengthening the tuna fishery evidence base and regular analysis of tuna fishery data and information build and maintain knowledge useful for strategic planning. This is to be undertaken in a transparent fashion to build trust among the concerned stakeholder groups. The improved, informed strategic planning then informs and ensures a mutually beneficial Grenada-ICCAT partnership.

Required changes in stakeholder behaviours and practices in both the public and private sector are to be supported by informed communication, outreach and education strategies.

2.1.3.4 VISION STATEMENT

In summary, the strategy's vision is that "*Grenada enjoys an international reputation as a responsible fishing State for tuna and tuna-like fish resources, supported by a national enabling environment that is characterised by good governance practices, and which ensures the best use of knowledge and stakeholder participation to*

achieve effective ICCAT participation and an optimised, equitable balance of benefits for present and future generations."

2.1.4 CORE VALUES, PRINCIPLES AND GUIDELINES

(i) Application of the following characteristics of good governance: accountable, transparent, responsive, equitable and inclusive, participatory, effective and efficient, consensus-oriented, follows the rule of law.
(ii) Application of a holistic approach to guarantee sustainable development of the tuna fishery, including incorporation of the precautionary approach, and the ecosystem approach to fisheries management.
(iii) Application of regional and international guidelines to prevent, deter and eliminate illegal, unreported and unregulated (IUU) fishing practices that threaten stability of marine ecosystem goods and services and benefits to legal operators.
(iv) Application of regional and international policies and guidelines concerning the responsible management and protection of small-scale fisheries interests.
(v) Application of the pertinent provisions of international fisheries-related agreements, which have been signed or ratified by Grenada, to guarantee effective implementation of the duties of Grenada as a flag State, port State, coastal State.
(vi) Application of national instruments adopted to support implementation of the National ICCAT Strategy for Grenada.

2.1.5 IMPACTS, ISSUES AND ROOT CAUSES

The desired impacts can be broken down into three components.

(i) Protection of existing social and economic benefits derived from Grenada's tuna fishery.
(ii) Further development of social and economic benefits, obtained from the tuna fishery, in a manner that does not harm the ability of the tuna fish stocks and marine ecosystem to sustain the benefits in the long term (across generations).
(iii) Equitable distribution of the social and economic benefits, through affording equitable participation in the tuna fishery.

The following issues appear to hinder achievement of the desired impacts.

(i) Limited/ passive management and development of tuna fishery evidence base and its usage and accessibility, which prevents good, quantitative understanding of current benefits to be protected, the potential for new benefits, and the linkages with benefits in other sectors, e.g. trade and tourism. The weakness of the evidence base also limits the fisheries sector's capacity to quantify and defend its contributions to national social and economic objectives and sustainable development goals.
(ii) Linked to the weakness of evidence base management, weak ICCAT cooperation / participation, particularly the annual routine ICCAT communication and reporting requirements, is negatively impacted.
(iii) Limited monitoring, control and compliance, perhaps due to limited resources or displaced by other priorities, which translates to weak ICCAT management compliance and management accountability. This can result in punitive actions by ICCAT, with possible cessation of the tuna export trade.
(iv) An open access tuna fishery, without a tuna fishery management and development plan, which limits Grenada's ability to protect current benefits, and to negotiate, in an informed manner, for new tuna fishing opportunities at ICCAT.
(v) The FAC is currently not active, but by law, the FAC would be the formal mechanism to foster representative stakeholder participation and effective co-management, and to support more responsive policy actions.
(vi) In view of the inactivity of the FAC, the private tuna fishery stakeholder community is not actively seeking to educate itself on tuna fishery management needs, including the impacts of fishing and the role of industry to follow good management practices.
(vii) Inter-ministerial/ sectoral coordination for addressing cross-cutting issues that could benefit from expertise resident and available in other ministries. These include foreign affairs, finance and investment, trade and economy, health, social protection, disaster and emergency management, women and youth, decent work

and other human rights issues, marine spatial planning, environmental protection, port inspections, sea patrols, etc.

The main root cause that contributes to the prevailing issues is the state of the national enabling environment, especially components responsible for:

- Management of the tuna fishery evidence base, its usage and accessibility, for maximising the benefits of ICCAT membership and participation;
- Equitable and effective tuna fishery stakeholder engagement, participation and education;
- Government's commitment to an established policy cycle that can facilitate tuna fishery policy and management adaptations in a timely fashion;
- Inter-ministerial coordination for a national, holistic approach and balanced outcomes across multiple objectives.

Strategic priorities (goals) and objectives are established to address these specific components of the national enabling environment that are necessary to support the tuna fishery and ICCAT participation.

2.1.6 Action/ Execution Plan

2.1.6.1 Strategic Priority 1 – Effective management, usage, and accessibility of tuna fishery evidence base

Current status

At present, the Fisheries Division maintains a database of registered and licensed fishing vessels, which includes data and information on: licence number; registration number; owner name and address, vessel name, mark and class; vessel status (local or foreign); port of registration; port of operation; vessel characteristics, including Length Overall (LOA), tonnage, and storage capacity; capacity for ice; crew number. However, the licensing system may not include all active fishing vessels (Sieben and Gascoigne, 2021). This database includes some information that potentially allows estimation of the numbers of fishers employed in the industry as vessel owners and crew. However, it does not capture other key social and economic data, e.g., gender, vessel price, average monthly/ annual income, nature and extent of participation in social protection programmes, family size, whether the fisher is the sole income provider for the family, whether fisher is full-time or part-time, and other social and livelihood data. The monthly/ annual income could be estimated from collection of harvest/ landings data by vessel by day, but this is not possible due to current gaps for collection of representative data on individual fishing trips and landings.

A paper-based system is used to collect data on fishing trips and landings. A daily log form has capacity to collect data on: date, landing site, vessel name and registration number, crew size, area fished, trip duration, hours fished, gear type and quantity, fishing depth data, weights of species caught and prices. The daily form is currently filled out by market staff. Market/ data clerks may not receive formal training data collection, and there are often gaps and inconsistency errors (Isaac, 2014). Catches are compiled on a weekly basis, and entered in a weekly fish landing log. Regarding data collection at the tuna processing plants and export companies, the Fisheries Division staff conducts periodic visits, and work with paper receipts provided by the plants to compile the landings information. The paper receipts are voluminous and are the property of private companies. Hence, these data are usually compiled on site; access by Fisheries Division staff is dependent on the time and resources allocated to data collection, which is currently limited. Considering the system and processes in place for collection of market and processing plant / export data, these are unlikely to guarantee representative sampling and data. Moreover, the plant/ exporting establishments record purchase and price data, and not total catches or landings (Isaac, 2014).

There are about 23 secondary sites, i.e. sites without any infrastructure, that are not covered by the existing statistical monitoring system, although some of the fish landed at these secondary sites may pass through the markets (op. cit.). While a raising factor of 1.4 is used to cater for under-reporting of large pelagic catches, this raising factor is based on pre-1980 fishing activities, and should be updated (Sieben and Gascoigne, 2021). No system exists to record discards, interactions with bycatch species, including endangered, threatened, and

protected species, and habitat and ecosystem interactions. Hence, no data are currently collected, that would allow evaluation of the ecological and environmental impacts of tuna fishing activities. In view of the paper-based system that is still in use, and staffing constraints at the Fisheries Division, the computerisation of data and overall quality control both suffer delays.

Reports of the status/ performance of the fisheries sector and of the tuna fishing industry are generated in response to requests, e.g. by CRFM, WECAFC, ICCAT, or during sponsored projects that are theme-focused, e.g. the JICA-sponsored Caribbean Fisheries Co-management project (CARIFICO) (CRFM, 2013, 2017). In the 1990s and up to 2013, Grenada's national tuna fishery data and information were incorporated into the annual Caribbean Community (CARICOM)[22] report to ICCAT. At around that time, a shift in ICCAT policy required countries to report their national data using specific ICCAT electronic forms; data submitted by other means were no longer being accepted and hence considered unreported. Due to the delay in computerising the data entered on paper forms and perhaps other resource limitations, Grenada has suffered disruptions in fulfilling its annual reporting obligations to ICCAT, including not being able to submit an annual report to ICCAT since becoming an ICCAT member in 2017 (e.g. ICCAT 2018, 2019b, 2023). The limited electronic capability for data and information management may likely also be a factor that prevents an arrangement for stakeholder and public access to at least those non-confidential data and information within the computerised Fisheries Division's database. Such access is essential for building trust and cooperation among all national stakeholders.

Strategic priority summary

The strength of the tuna fishery evidence base, its usage and accessibility are essential for underpinning all major steps of a successful, active and adaptive policy/ management cycle: establishing suitable goals, planning, data collection and analysis, review and evaluation, representative stakeholder consultation and negotiations, and adaptive decision-making. Moreover, to achieve a holistic approach for sustainability of social, economic and environmental benefits simultaneously, management of the evidence base and its usage would have to consider the social, economic and environmental data and information needs of the policy/ management cycle. At minimum, the strengthened evidence base and usage will enable accountability against the objectives and measures included in Grenada's tuna fishery management and development plan (CH Business Consulting, 2024a).

In the case of the tuna fishery policy/ management cycle, the social objectives/ needs include, *inter alia*: national food and nutrition security; social protection for livelihood risk management, in response to all forms of risk; youth and gender issues, considering the need for fishing industry livelihood continuity and fair and efficient use of available national human resources; the fishery's contribution to poverty alleviation as it relates to social and livelihood protection and resilience. The economic objectives include the fishery's continued and possible increased contribution to: export revenue and livelihood/ income opportunities; industry diversification through improved value chain design and management; reduced food loss through improved fish handling and processing standards; economic risk management; and, foreign direct investment. The environmental objectives include: sustainable exploitation of tuna stocks and recovery of any depleted stocks, prevention of IUU tuna fishing activities and other environmentally damaging tuna fishing practices; ensuring measures to maintain the structure, productivity, function and diversity of the ecosystem and associated habitats and ecological communities; and, ensuring tuna fishery measures that complement in a positive way other economic activities within the marine space.

The evidence demands are broad, but in view of the notable value of the tuna fishery in respect of its social and economic contributions, including to export revenue, additional public sector investment in strengthening the evidence base is warranted. Such investment can be directed towards those aspects of the evidence base that would not be covered through collaboration with companion ministries with overlapping mandates, or through regional cooperation arrangements. Among the most urgent needs is the need for the Fisheries sector to be

[22] CARICOM has held observer status at ICCAT since 1991

supported by an electronic system of data and information collection. Such a system will enable easier, and more timely capture of data and information on all aspects of fishing operations along the value chain, from 'real time' reporting of fish catch and effort data, to market and processing data, and exports. It will also support good governance practices, as the electronic system should enhance transparency and accessibility of data and information by the stakeholder community, to inform their contributions to the policy/ management cycle process. For tuna fishery data analysis related to fish stock status, ecology and environment impacts, the Fisheries Division can request assistance and expertise of both regional (CRFM and WECAFC) and ICCAT technical/ scientific committees and/ or working groups. National, regional and ICCAT technical assistance arrangements also provide opportunities for collaboration in research, which would ease the burden on the national human and financial resource base.

At the national level, there are companion ministries that may conduct data and information collection on subjects of interest across all economic sectors, e.g. ministries responsible for social protection, labour, emergency management, environment, climate resilience, blue economy. In such cases, the Fisheries Division can establish formal working relations for the purpose of broadening data collection, data and information sharing, compilation, analysis, etc. The Fisheries Division can ensure that the relevant industry data of interest are captured by the routine data and information collection activities conducted by these companion ministries. A memorandum of agreement between the Fisheries Division and the participating companion ministries is desirable for the purpose of sharing data and information, for joint analyses and interpretation, reporting, knowledge management, communication and outreach/ education functions. By this means, the Fisheries Division can join its resources (human, technical and financial resources) with those of available companion ministries for achieving synergies that are mutually beneficial. This inter-ministerial coordination and cooperation will also result in greater policy coherence across the ministries concerned.

On behalf of the industry, the Fisheries Division is expected to lead coordination of the various sources of evidence contribution pertaining to the tuna fishery. This coordination effort should be incorporated into the tuna fishery policy/ management cycle, in a manner that aligns with the annual ICCAT fisheries policy/management cycle that runs from January to December each year. Additionally, Fisheries Division's coordination work would have to include, at minimum: management of the fisheries electronic data system; collaboration with companion ministries on data, information and knowledge management for development of a broader evidence base capable of addressing multiple objectives; collaboration with national and regional partner institutions and ICCAT working groups for tuna fishery data analysis and research. By this means, Grenada will be in a strong position to fulfil its annual reporting obligations to ICCAT, to prepare for tuna fishery management and catch quota negotiations at the annual ICCAT Commission meetings, to account for the fishery's contributions to agreed management and development objectives. Facilitating transparent accessibility of the data and information by at least fishery stakeholders will support informed, private sector investment and development activities.

2.1.6.1.1 GOALS / OUTCOMES AND OUTPUTS

The long-term goal/outcome that represents the desired state is:

- Effective management, usage and accessibility of the tuna fishery evidence base for maximising the benefits of ICCAT membership and participation.

The intermediate outcome that represents improvements in public and private sector behaviours and practices required for the desired long-term outcome, is:

- Improved public-private governance arrangements and practices for ensuring effective management of tuna fishery data, information and knowledge. The following improvements contribute to this outcome.
    - Fisheries Division's digitalised data and information system covers all aspects of tuna fishery sector operations.
    - Fisheries Division staff actively manage the electronic system, and implement inter-ministerial cooperation arrangements to broaden the types of data and performance analyses, and are

capable of providing holistic advice for informing tuna fishery policy/management plans and decisions by both the public and private sector.

- Fisheries Division is actively collaborating with ICCAT, regional and national organisations and institutions to undertake research that informs effective participation in ICCAT.
- Private sector tuna fishery stakeholders cooperate to contribute complete data and information to the Fisheries Division's electronic system, enjoy good access to the system and understanding of the national reports and positions developed to inform ICCAT participation, and can make evidence-based business and investment decisions.

Immediate outcomes that provide new and improved knowledge, skills and capacities, required to realise desired arrangements, behaviours and practices, are:

- Digitalisation of Fisheries Division data and information management activities for the tuna fishery, including improved organisation of data storage, access and sharing among potential public and private sector users, including among ministries with overlapping objectives/ interests.
- Improved Fisheries Division knowledge/ understanding, skills and capacity for effective and efficient data and information management and usage, facilitation of data and information sharing, analysis and reporting among users and ministries.
- Improved Fisheries Division capacity and arrangements for undertaking supporting research to strengthen scientific knowledge.
- Improved tuna fishery private sector skills to contribute to and to access the Fisheries Division data and information system.
- Improved private sector understanding of the national reports and positions developed to inform ICCAT participation, and business and investment decisions.

Outputs required to deliver new and increased knowledge, skills and capacities are:

- Prepared and implemented proposal for digitalisation of Fisheries Division data and information management activities for the tuna fishery, facilitating 'real time' collection and storage of data, 'real time' national-level reporting commitments to ICCAT, and 'real time' inter-ministerial collaboration on data sharing, analysis and reporting.
- Trained Fisheries Division staff in: use of digitalised system for data and information management including facilitation of data and information access by tuna fishery stakeholders, and for inter-ministerial collaboration; and preparation of tuna fishery reports, as required by ICCAT.
- Strengthened skills and capacities of Fisheries Division staff to provide multiple-objective, evidence-based management guidance for tuna fishery sub-sector development and diversification and to account for balanced achievement of social, economic and environmental outcomes.
- Strengthened skills and capacities of Fisheries Division staff to develop tuna fishery communication, education and outreach products for various publics.
- Research collaboration arrangements established and implemented with national and regional partner institutions and with ICCAT, for strengthening the tuna fishery evidence base.
- Tuna fishery stakeholder groups trained in: options for contributing to the digitalised Fisheries Division data and information system; access and use of agreed, non-confidential tuna fishery sector data and information to support private sector business and investment decisions; and interpretation of national reports and positions developed to inform ICCAT participation, business and investment decisions.

2.1.6.1.2 OBJECTIVES AND SUPPORTING ACTIONS

2.1.6.1.2.1 Objective 1.1 and actions

Objective 1.1 – To digitalise Fisheries Division data and information management for the tuna fishery for facilitating 'real time' collection and storage of data on all key aspects of tuna fishery operations, 'real time' national-level reporting commitments to ICCAT, and 'real time' inter-ministerial collaboration on data collection and sharing.

Key Actions

1.1.1. Develop and implement proposal to establish/ strengthen and maintain a digitalised Fisheries Division data and information system for the tuna fishery that can facilitate receipt of data via electronic means and in 'real time', especially to facilitate greater monitoring, control, management and reporting of fishing operations. This system will be kept under regular review, and will support, *inter alia*, Grenada's annual reporting obligations to ICCAT.

1.1.2. Design the digitalised Fisheries Division data and information system to capture data and information on all aspects of tuna fishery and value chain operations (e.g. fishing operations, post-harvest operations, export operations, port operations, transshipment operations, waste management operations). This system is expected to be kept under regular review, and to produce at least one annual report, providing an evaluation of tuna fishery performance against agreed objectives and measures, which are documented in the tuna fishery management and development plan.

1.1.3. Design the digitalised Fisheries Division data and information system to facilitate data and information exchange with other relevant databases held by other ministries, to broaden the information base on industry practices and performance for generation of holistic advice to improve the coherence of the relevant national policy responses and afford accountability regarding required balanced outcomes at the national and international levels, e.g. SDGs.

2.1.6.1.2.2 Objective 1.2 and actions

Objective 1.2 - To improve Fisheries Division skills and capacity to manage and use its digitalised system for data and information management, for fulfilling all annual reporting obligations under ICCAT, for informing/ educating tuna fishery stakeholders and companion ministries about the issues of concern, and for inter-ministerial collaboration on data analysis and reporting.

Key Actions

1.2.1. The Fisheries Division will establish and implement an annual schedule of essential ICCAT participation activities, including fulfilment of ICCAT reporting obligations by the stipulated deadlines.

1.2.2. The Fisheries Division will maintain and keep its ICCAT participation process under review, i.e. annual participation schedule, reporting deadlines, and quality of submissions (data, compliance information, annual report and other contributions to ICCAT).

1.2.3. Fisheries Division skills and capacity are to be strengthened to establish and maintain a cycle of data analysis practices capable of accounting for performance of agreed tuna fishery management and development objectives. Data analyses are to include, *inter alia*:

(i) Analyses to improve understanding of tuna fishery's characteristics and trends, to quantify contributions and challenges to biological, ecological and environmental objectives;
(ii) Analyses to improve understanding of tuna fishery's social and economic contributions to agreed, related national and international goals and objectives;
(iii) Analyses to improve understanding of tuna fishery's potential to address additional national fishery development and diversification needs, and which could inform and promote new entrepreneurship and investment.
(iv) Trade-off analyses to inform multiple-objective plans and decisions, at the fishery, sector, and national (inter-ministerial) levels.

1.2.4. The Fisheries Division is to strengthen its scientific collaboration arrangements to make use of external expertise to assist with data/ evidence analysis and preparation of documentation, including:

(i) Identify CRFM and WECAFC working groups for regional level support in analysis.
(ii) Make use of ICCAT assistance programmes to obtain support from ICCAT for strengthening the evidence base and analysis functions.

1.2.5. The Fisheries Division is to establish/ strengthen its reporting, communication and outreach functions, to document results and conclusions of tuna fishery data analyses for: informing / educating tuna fishery stakeholders on findings, conclusions and recommendations: informing ICCAT participation; and informing/ educating companion ministries on key fisheries management and development issues.

1.2.6. The Fisheries Division is to establish and implement an ICCAT inter-ministerial coordination mechanism to facilitate sharing of useful information and knowledge on ICCAT cooperation and sustainable tuna fishing practices. This is expected to include:

(i) Development and implementation of a proposal and associated Cabinet paper for establishment of the ICCAT inter-ministerial coordination mechanism, aimed at including at least those ministries responsible for foreign affairs, finance, trade, health, port and maritime security, and social protection.
(ii) Implementation of the ICCAT inter-ministerial coordination mechanism, that should include:
- Convening of regular meetings, at least quarterly, for information and knowledge exchange, particularly scientific and management updates as these relate to ICCAT participation, tuna fishery contributions to national objectives, and tuna fishery development and diversification potential.
- Development of evidence-based national positions for effective participation in ICCAT's scientific work and management deliberations.
- Evaluation and development of national positions on foreign direct investment and international donor support in linked areas of social and economic development.

2.1.6.1.2.3 Objective 1.3 and actions

Objective 1.3 – To establish and implement tuna fishery research collaboration arrangements with ICCAT, as well as with national and regional partner institutions, for improved understanding of national fishery status, while also contributing to ICCAT's science and management process and elevating Grenada's ICCAT cooperation status.

Key Actions

1.3.1. On an annual basis, identify and participate in suitable ICCAT statistics/ research programmes and maintain a national record of these contributions.

1.3.2. Evaluate and promote ecosystem-friendly tuna fishing practices, with research partnership collaboration options identified.

1.3.3. Identify and pursue tuna fishery research collaboration arrangements with ICCAT, regional fisheries organisations, and national and regional research institutions such as the Marine Wildlife and Conservation Biology Department at Saint George's University (SGU), and keep this process under review, to take advantage of expertise and funding available to collaborating organisations/ institutions.

1.3.4. Keep under review and report on the implementation and effectiveness of tuna fishery management measures applied to Grenada's fishery and communicate this to ICCAT to build enhanced ICCAT cooperation profile.

1.3.5. Document ICCAT cooperation efforts and achievements, together with regularly updated tuna fishery performance reports, to satisfy current and potential fishing industry investors, as well as current and potential new trading partners, including:

(i) Production of annual reports on the efficacy of Grenada's ICCAT cooperation efforts, including *inter alia*: approved tuna fishing opportunities; tuna fishing performance trends.

(ii) Production of various communication products to enhance visibility of the success of the tuna fishing industry and ICCAT participation.

(iii) Use of modern social media for communication and outreach activities.

2.1.6.1.2.4 Objective 1.4 and actions

Objective 1.4 – To improve the skills and capacity of tuna fishery stakeholder groups to provide their data and information inputs to the digitalised Fisheries Division data and information system/ process, to understand national reports and positions developed to inform ICCAT participation, and to access and use agreed, non-confidential tuna fishery sector data and information to support private sector business and investment decisions.

Key Actions

1.4.1. Identify and implement suitable options for private sector tuna fishery stakeholders to provide their tuna operation data and information, in electronic format, for 'real time' incorporation into the digitalised Fisheries Division system/ process.

1.4.2. Strengthen the skills and capacities, as needed, of private tuna fishery stakeholder groups to contribute via the various, identified electronic data reporting options.

1.4.3. Strengthen the skills and capacities of private tuna fishery stakeholder groups, especially community-level and other vulnerable tuna fishery stakeholder groups to access the Fisheries Division's electronic system, to use the data to support private sector management decisions, e.g. regarding livelihood, industry and investment. This action can be advanced in collaboration with the Ministry of Finance which was working on an initiative aimed at creating a web portal for stakeholder access to information on fishery performance and projections (Sieben and Gascoigne, 2021)

1.4.4. Strengthen the skills and capacities of private tuna fishery stakeholder groups to interpret the tuna fishery technical reports and related national positions developed by the Fisheries Division for submission to ICCAT, and to inform ICCAT participation.

2.1.6.2 STRATEGIC PRIORITY 2 – EFFECTIVE, EQUITABLE STAKEHOLDER PARTICIPATION

Current status

World Bank (2019) noted that Grenada had a diverse set of fisherfolk organisations, with some operating as commercial enterprises and others aimed only at representing fisherfolk issues and interests. Notwithstanding, the Fisheries Division has made efforts to strengthen fisherfolk capacity for co-management (op. cit.). These efforts have often been assisted by projects, e.g. the JICA-sponsored CARIFICO project. The Fisheries Division uses its Fisheries Extension Offices and officers to engage with stakeholders, and may also hold ad hoc meetings to facilitate information inputs by stakeholders (Sieben and Gascoigne 2021). However, a formal process/ arrangement for use of stakeholder information to inform fisheries management decisions and for sharing of information with stakeholders was not evident (op. cit.). In the case of the tuna longline fishery, Gentner *et al*. (2018) noted an absence of stakeholder meetings and a formal process for public and stakeholder inputs into the fisheries management process. In addition to these current challenges, stakeholder capacity for effective participation in a co-management arrangement may not be at the desired level (op. cit.). Of 200 fisherfolk who were surveyed, only 5% were members of any fisherfolk organisation (World Bank 2019). Additionally, where the fisherfolk organisations exist, staffing skills and capacities were found to be limited, especially for management of funds, and technical work such as data collection and bookkeeping (op. cit.).

Certain key factors pose challenges to achieving effective, equitable stakeholder participation in the fisheries management process. A regional assessment of poverty within the fisheries sector found that just over 25% of Grenadian fishing households (25% of 127 participants interviewed) confirmed the lack of at least one basic unsatisfied need, of which access to services (access to drinking water and excreta disposal services) and dwelling quality (construction materials and overcrowding) criteria were most important, followed by economic capacity (income level) and education (children's schooling) (CRFM 2012). Additionally, many fish handlers, processors and vendors are women, but they are not recognised as fish workers by the government (CRFM 2020).

Strategic priority summary

In Grenada, the fisheries sector contributes to national food and nutrition security, poverty alleviation, sustainable livelihoods through employment and income provision, and foreign trade (Rennie, in prep.). Grenada's dependence on the sustainability of these critical social and economic benefits are, in turn, directly dependent on the sustainability of the natural, renewable fishery resources of Grenada. Guidance for achieving a balanced sustainability of social, economic and environmental benefits is embodied in the 2030 Agenda for Sustainable Development[23]. In particular, the relevant social and economic sustainable development goals address quality of human life, well-being and prosperity within the context of sustainability of nature's resources. Fisheries management faces the challenge of balancing fishery resource sustainability needs with multiple social and economic goals and objectives for a range of stakeholder groups. In this undertaking, success is more likely to be achieved if stakeholders understand the justification for management decisions, appreciate that their social and economic interests are considered, and are willing to cooperate in ensuring management compliance.

To enable effective, equitable stakeholder participation in a tuna fishery policy/management cycle, it would be important for stakeholder groups to be organized, informed and active about the issues at stake. Consequently, the tuna fishery policy/ management cycle is expected to be formally established and to include a formal process for: engaging with stakeholder groups, facilitating stakeholder inputs routinely, and allowing stakeholder groups to access all the relevant data and information that are used to guide the tuna fishery management planning, and decision-making process. Stakeholder groups' skills and capacity levels for organization, knowledge management and participation in meetings and negotiations will vary. Strengthening these skills and capacities, especially for community-level and vulnerable stakeholder groups, is a key step to achieving effective, equitable stakeholder participation in the fisheries management process. Additionally, Rennie (in prep.) highlighted the need for strengthening fisherfolk skills and capacity in business, leadership, and technology.

2.1.6.2.1 GOALS/ OUTCOMES AND OUTPUTS

The long-term goal/ outcome that represents the desired state is:

- Effective, equitable stakeholder participation guarantees just treatment of stakeholder groups, cooperation for tuna fishery management actions, and sustainable social and economic development.

The intermediate goal/ outcome that represents the improvements in public and private sector behaviours and practices, required for the desired long-term outcome, is:

- Improved public-private governance arrangements and practices for ensuring effective, equitable stakeholder participation and by this means, just treatment of stakeholder groups, cooperation for tuna fishery management actions, and sustainable social and economic development. The following represent contributions to this outcome.
    - Active ICCAT Working Group (ICCAT WG), with equitable stakeholder representation and effective participation at meetings.
    - All tuna fishery stakeholders enjoy good understanding of tuna fisheries issues, and actively provide inputs through their group representatives to inform FAC and ICCAT WG meetings.
    - The tuna fishery sub-sector promotes practices to yield social and economic benefits that are balanced with tuna resource sustainability needs and which are also aligned with the 2030 Agenda for Sustainable Development.

Immediate outcomes that support new and improved knowledge, skills and capacities required to realise desired arrangements, behaviours and practices are:

- Establishment by the FAC of an ICCAT WG, with responsibility for implementation of the tuna fishery policy/management cycle, for reporting its work progress to the FAC, and for participating in relevant inter-

[23] https://sdgs.un.org/2030agenda

ministerial collaboration activities as required. [*This is linked to FAC revival addressed under Strategic Priority 3*]

- Established equitable representation by tuna fishery stakeholders in the ICCAT WG, including establishing/ strengthening a dedicated aFAD Working Group to represent the needs of the aFAD fishery participants.
- Improved stakeholder knowledge and understanding of tuna fishery management issues, and improved skills for organised group representation at fisheries meetings.
- Continual improved understanding by tuna fishery stakeholders of good standards for navigation and safety at sea.
- Improved tuna fishery sector understanding of social and economic goals and possible actions for achieving sustainability.

Outputs required to deliver increased knowledge, skills and capacities are:

- Development and implementation of proposal and Terms of Reference for establishment and operation of ICCAT WG, with membership reflecting representation of all tuna fishery stakeholder groups, and identifying the ICCAT WG's relations with the FAC.
- Strengthened skills and capacities of vulnerable tuna fishery stakeholder groups for organised representation and participation at tuna fishery meetings.
- Tuna fishery stakeholders educated on ICCAT and tuna fishery management issues.
- Delivery of continued Fisheries Division education /outreach activities to maintain and improve standards of navigation and safety at sea, which occurs during the annual period of fishing vessel inspection.
- Strengthened tuna fishery sub-sector for improved and sustainable social and economic performance, consistent with the social and economic goals embodied in the 2030 Agenda for Sustainable Development.

2.1.6.2.2 OBJECTIVES AND SUPPORTING ACTIONS

2.1.6.2.2.1 Objective 2.1 and actions

Objective 2.1 – To establish and operate an ICCAT WG, with equitable tuna fishery stakeholder representation, and with capacity to access external expertise to support the WG in its tasks.

Key Actions

2.1.1. Develop and implement proposal for establishment of an ICCAT WG with associated Terms of Reference, considering, at minimum: the need for the Working Group membership to guarantee fair representation by all tuna fishery stakeholder groups, including support for establishment/ strengthening of a dedicated aFAD Working Group; the option for the Working Group to serve as a subsidiary body to the FAC; the responsibility to oversee/ guide implementation of a national tuna fishery policy/ management cycle; and facilitate formal inter-ministerial representation/ participation, as needed.

2.1.2. Establish a cycle of technical/ scientific and management contributions by the ICCAT WG that are aligned with the implementation of a national tuna fishery policy and management cycle and the annual cycle of ICCAT management activities. The arrangement should enable the ICCAT WG to access external technical/ scientific and management expertise, as needed. In instances of inter-ministerial collaboration, other ministries may be able to supply additional technical/ scientific and management inputs.

2.1.6.2.2.2 Objective 2.2 and actions

Objective 2.2 – To strengthen the skills and capacity of community-level and other potentially vulnerable tuna fishery stakeholder groups for effective (informed and organised for delivery of agreed objectives) participation in the ICCAT WG and the national tuna fishery policy/ management cycle.

Key Actions

2.2.1. Develop and implement proposal for strengthening the skills and capacity of community-level and other potentially vulnerable tuna fishery stakeholder groups, including establishing and/or strengthening a dedicated aFAD Working Group, for effective participation in the ICCAT WG, particularly capacity building in organisation management. This is expected to include, at minimum, training in: team leadership; team management; strategic planning; information management for active, meaningful inputs into the national tuna fishery policy/ management cycle; preparing for and conducting negotiations; conflict resolution management; communication, reporting, outreach, and networking.

2.2.2. Design and implement a programme to educate tuna fishery stakeholders on ICCAT and tuna fishery management issues, for improved, holistic performance and contributions to environmental, social and economic objectives.

2.1.6.2.2.3 Objective 2.3 and actions

Objective 2.3 – To implement initiatives to strengthen tuna fishery sub-sector capacity to implement good management practices for enhanced and sustainable holistic performance and contributions, aligned with the relevant goals embodied in the 2030 Agenda for Sustainable Development.

Key Actions:

2.3.1. Using the ICCAT WG and/ or other public private partnership (PPP) arrangement, identify and document good and responsible management practices within the tuna fishing industry.

2.3.2. Facilitate knowledge sharing and other types of exchanges among stakeholder groups to build capacity and expand good and responsible management practices across the industry. Knowledge sharing within the sub-sector should focus on lessons and best practices regarding compliance with the 2030 Agenda for Sustainable Development, especially regarding goals for achieving environmental-friendly practices, safety at sea, decent work conditions, gender equality and equity, adequate social protection, livelihood and sector risk and resilience management.

2.3.3. Using the ICCAT WG and/ or other (PPP) arrangement, develop guidance for government on policy/ management/ regulation options to encourage good and responsible management practices suitable for the Grenada situation and which can optimise the sub-sector's social, economic and environmental performance and hence fulfil its contribution to the 2030 Agenda for Sustainable Development.

2.3.4. Using the ICCAT WG and/ or other PPP arrangement, provide guidance to government on options to encourage livelihood and economic diversification options that make improved use of the current raw material provided by the tuna fishery, i.e. improved value chain management and design, waste minimisation to reduce food loss, development of new commercial products from inedible fish waste.

2.3.5. Capacity building needs of the private sector for strengthening good and responsible tuna fishery management practices, should routinely be included in projects and programmes, alongside the capacity building needs of the public sector.

2.3.6. Fisheries Division is expected to continue its annual education/ outreach activities to promote improved understanding of good standards of navigation and safety at sea, delivered during the annual period of fishing vessel inspections.

2.1.6.3 Strategic Priority 3 – Active, adaptive national tuna fishery policy/management cycle

Current status

The Fisheries Act provides for a Fisheries Advisory Committee (FAC), which is appointed by the Minister responsible for fisheries to advise on fisheries management and development (Anon. 1986). The 1986 Act indicates that the Minister is responsible for determining the constitution, functions, and duties of the FAC, and also who should serve on the FAC besides the Chief Fisheries Officer. Regulations introduced in 1987, established the FAC, and provided specific guidance on both the membership and functions of the FAC (Anon. 1987). It identified specific representation by the artisanal fishery and professional fisherfolk on the FAC. FAC functions were also elaborated, and included provision of advice on proposals for access agreements, development projects, joint investment ventures, regional harmonisation of fisheries management actions, and inter-ministerial policy and activity coordination (op. cit.).

According to the legislation, the FAC is an advisory body only. While the FAC was active in earlier years, it has not been active in recent years (Genter *et al*. 2018, CH Business Consulting 2024b). It is not clear if the FAC produced reports on a regular basis during its active years; such reports would have been necessary for transparency and accountability for Ministry-level policy and management decisions.

Strategic priority summary

The absence of an active FAC and of a routine FAC policy/ management cycle means that there is currently no formal government mechanism in place to guarantee a structured, accountable fisheries policy and management process, and which could facilitate stakeholder participation in a fair and transparent fashion. Given this scenario, tuna fishery stakeholders would be unable to appreciate Ministry-level policy and management decisions, and whether stakeholders' interests and concerns were taken into account.

Though the FAC is an advisory body only, it can still be a strong advocate for the sector and for the interests and concerns of stakeholders. This can be achieved by: (i) nurturing a good working relationship with the responsible Minister, as Belize's Fisheries Advisory Board practiced successfully for many years (Singh-Renton, in prep.); ensuring full access by the public and stakeholders to the data and information used by the FAC to inform its deliberations and negotiations; and (iii) producing reports documenting FAC advice on policy and management decisions. Once the FAC is revived, it is expected to establish a time-based (preferably, annual) fishery-specific formal policy/management cycles, including a specific tuna fishery policy/ management cycle, with activity phases for: planning and setting of goals and objectives, data collection, analysis and interpretation, review and evaluation, consultation and negotiations, conflict resolution and adaptative response action.

Among the provisions included in the 1987 regulations (Anon. 1987), the FAC is to advise the Minister on fisheries management and development, and the FAC is to accommodate other functions assigned by the Minister. In renewing the FAC, its Terms of Reference could include additional functions, sanctioned by the Minister as required, to ensure good governance practices, especially effective, equitable stakeholder participation, consensus building, transparency and accountability. For the tuna fishery sub-sector, good governance can be supported by the establishment of a tuna fishery policy/ management cycle, and setting up a subsidiary body, the ICCAT Working Group (ICCAT WG) (as described under Strategic Priority 2), to oversee and guide implementation of the tuna sub-sector policy/ management cycle process for and on behalf of the FAC. This arrangement allows the FAC to serve as an umbrella body, and the ICCAT WG to have a separate working space, but still be accountable to the FAC. The separate working space of the ICCAT WG will enable more focused discussions of tuna fishery sub-sector issues and analyses, and more frequent and extensive stakeholder consultations. By this means also, the ICCAT WG can support the FAC to achieve stronger consensus building for tuna fishery policy and management decisions, as well as a deeper level of understanding and cooperation by the tuna fishery stakeholder community.

2.1.6.3.1 GOAL/ OUTCOMES

The long-term goal/outcome that represents the desired state is:

- A proactive government/ ministry-led mechanism for evidence-based, timely and adaptive tuna fishery policy and management responses, aligned with the annual ICCAT management cycle.

The intermediate outcome, aimed at reflecting improvements in public and private sector behaviours and practices required for the desired long-term outcome, is:

- Improved public-private governance arrangements, behaviours, and practices for ensuring a proactive government/ ministry-led mechanism for evidence-based, timely and adaptive tuna fishery policy and management responses, aligned with the annual ICCAT management cycle. The following represent contributions to this outcome.
    - FAC enjoys a stakeholder membership composition that is truly representative of all components of the fisheries sector.

- FAC actively implements a formal fisheries policy/management cycle, that incorporates an active tuna fishery policy/management cycle.
- Actively implemented tuna fishery policy/ management cycle.
- An established ICCAT WG that oversees implementation of the tuna fishery policy/ management cycle and serves as a subsidiary body of the FAC. [*This outcome is addressed under Strategic Priority 2*]

Immediate outcomes that provide new and improved knowledge, skills and capacities required to realise desired arrangements, behaviours and practices are:

- Revival of FAC, with a stakeholder membership composition that is truly representative of all components of the fisheries sector. [*Refer to related outcome under Strategic Priority 4*]
- Establishment of a general time-based (preferably, annual) FAC fisheries policy/management cycle.
- Establishment by the FAC of a formal, annual, national tuna fishery policy/ management cycle, with activities aligned with the corresponding annual ICCAT management cycle activities.
- Establishment by the FAC of an ICCAT WG, with responsibility for implementation of the national tuna fishery policy/management cycle, for reporting its work progress to the FAC, and for participating in relevant inter-ministerial collaboration activities as required. [*This outcome is addressed under Strategic Priority 2*]

Outputs required to deliver increased knowledge, skills and capacities are:

- Proposal for revival of FAC that considers:
  - a suitable membership arrangement to ensure that all fisheries stakeholder groups are represented and also ministries with overlapping objectives/ interests shared with the fisheries sector [*Refer to related output under Strategic Priority 4*];
  - functions to support good governance practices by the FAC;
  - establishment of a time-based (preferably annual) fisheries sector policy/ management cycle;
  - the need for establishment of a tuna fishery policy/ management cycle;
  - the need for establishment of technical working groups, such as the proposed ICCAT WG. [*Refer to related output under Strategic Priority 2*]
- Proposal for annual national tuna fishery policy/management cycle, aligned with the corresponding ICCAT annual management process.
- A 5-year tuna fishery management and development plan for informing implementation of the national tuna fishery policy/management cycle.
- A Monitoring, Control and Surveillance (MCS) system to support implementation of the national tuna fishery policy/management cycle, and ICCAT cooperation demands.
- Development of proposal, with Terms of Reference for establishment of ICCAT WG, which considers: membership reflecting representation of all tuna fishery stakeholder groups; functions of the ICCAT WG, including responsibility for implementation of the tuna fishery policy/ management cycle; the ICCAT WG's relations with the FAC. [*This output is addressed under Strategic Priority 2*]

2.1.6.3.2 OBJECTIVES AND SUPPORTING ACTIONS

2.1.6.3.2.1 Objective 3.1 and actions

Objective 3.1 – To re-establish the national Fisheries Advisory Committee (FAC) to serve as the ministry-led, government commitment mechanism and to promote good governance practices for fisheries policy/ management. [*See also Strategy Priority 4 on FAC membership and actions for a 'whole-of-government' approach for and on behalf of the tuna fishery sub-sector*]

Key Actions

3.1.1. Develop a proposal for re-establishing the FAC that considers: a suitable membership arrangement to ensure that all fisheries stakeholders groups are represented and also ministries with overlapping objectives/ interests shared with the fisheries sector; functions to support good governance practices by the FAC; establishment of a time-based (preferably annual) fisheries sector policy/ management cycle; the need for establishment of a tuna fishery policy/ management cycle; the need for establishment of technical working groups, such as the proposed ICCAT WG.
Regarding good governance, special attention should be given to addressing the need for effective and equitable stakeholder participation, consensus building, transparency and accountability. To support good governance, consideration should be given to allow the FAC to serve as an umbrella body, and facilitating the establishment of fishery-specific working groups that can carry out more detailed work and report to the FAC. In the case of the tuna fishery, the ICCAT WG is proposed have responsibility for implementing an annual tuna fishery policy/ management cycle, and for reporting to the FAC. The annual cycle of activities by the ICCAT WG ought to be aligned with the annual demands of ICCAT participation requirements. In addition, the FAC proposal is to include team leadership and management training, as well as training in conflict resolution management, for senior FAC and ICCAT WG members.

3.1.2. Implement proposal at 3.1.1.

2.1.6.3.2.2 Objective 3.2 and actions

Objective 3.2 – To establish and implement a formal, annual national tuna fishery policy/ management cycle that is aligned with the annual ICCAT management cycle.

Key Actions

3.2.1. The Fisheries Division, in collaboration with the ICCAT WG is to establish, and implement an annual national tuna fishery policy/ management cycle. This cycle consists of several steps, supported by activities, including: routine meetings; strategic planning; data collection and research; analysis and interpretation; review and evaluation; consultation and negotiations; preparing tuna fishery management and development advice routinely for consideration by the FAC and to inform inter-ministerial collaboration as needed; communication and reporting on the policy/ management analysis process, including use of data and information for informing final decisions. The cycle should be aligned with the annual schedule of ICCAT participation demands.
Some key responsibilities for routine ICCAT participation include:

(i) Identification of core ICCAT meetings and panels for routine participation.

(ii) Establishment of an annual schedule of essential ICCAT participation activities, in alignment with ICCAT information submission deadlines, and with emphasis on establishment and management of national submission of data, compliance information, annual report and all essential routine annual national contributions to ICCAT.

(iii) Identification and agreement of public and private sector roles and responsibilities pertaining to ICCAT participation.

(iv) Identification and agreement of data and information sources for fulfilling statistical and management compliance reporting obligations to ICCAT, and the process and resources required for management of this.

(v) Identification and agreement of data and information sharing protocols and supporting arrangements at the national level, and between Grenada and ICCAT.

(vi) Identification and agreement of options for contributing actively to ICCAT's science and management process that also benefits Grenada's tuna fishery's interests and aspirations. This is intended to elevate Grenada's cooperation status, with an annual cycle of review and reporting. It includes the need: to identify and participate in suitable ICCAT statistics/ research programmes and

to maintain a national record of these contributions; to keep under review and report on the implementation and effectiveness of tuna fishery management measures applied to Grenada's fishery and communicate this to ICCAT to build enhanced cooperation profile. [*This activity is linked to Strategic Priority 1*]

(vii) Identification and implementation of reporting and communication requirements for the ICCAT WG, and with the FAC and other national bodies, including inter-ministerial arrangements, as needed.

2.1.6.3.2.3 Objective 3.3 and actions

Objective 3.3 - To develop and keep under review a 5-year tuna fishery management and development plan to guide implementation of the tuna fishery policy/ management cycle, and to support review of Grenada's contributions to tuna fishery management and of Grenada's tuna fishery development needs.

Key Actions

3.3.1. The Fisheries Division, supported by the ICCAT WG, is to prepare and implement 5-year tuna fishery management and development plan (hereinafter Tuna FMP), which should include the following:

(i) Tuna fishery management and development objectives and measures;

(ii) Details of current fleet and any fleet expansion plans, including tuna fishing opportunity requirements;

(iii) Harvest control rules, in accordance with relevant agreed ICCAT measures.

3.3.2. Review and update the Tuna FMP, at least every 2 years, or more regularly as new ICCAT measures may require.

2.1.6.3.2.4 Objective 3.4 and actions

Objective 3.4 – To establish and implement a MCS system, which could support implementation of ICCAT management recommendations, including combatting IUU and other fishing practices that threaten the sustainability of legal tuna fishery operations.

Key Actions

3.4.1. Develop a proposal for a suitable tuna fishery MCS system and plan, with sustainable financing options.

3.4.2. Establish a formal MCS inter-ministerial collaboration arrangement, by means of a Memorandum of Agreement (MoA), with ministries responsible for the police service, coastguard service, port services, and legal affairs, and which defines tasks, roles, and responsibilities for each of the ministries involved. Similar to the ICCAT WG, this inter-ministerial arrangement could be established as a subsidiary body of the FAC, once the latter is re-established.

3.4.3. Implement the MCS MoA, which would have responsibility for meeting organisation, information management, tuna fishery MCS management advice, communication and reporting.

3.4.4. Document Grenada's tuna fishery MCS efforts annually, incorporating the relevant details into the required annual national reports to ICCAT.

2.1.6.3.2.5 Objective 3.5 and actions

Objective 3.5 - Development of proposal, with Terms of Reference for establishment of ICCAT WG, which considers: membership reflecting representation of all tuna fishery stakeholder groups; expected functions of the ICCAT WG, including responsibility for implementation of the tuna fishery policy/ management cycle; the ICCAT WG's relations with the FAC.

Key Actions [Addressed under Strategic Priority 2]

2.1.6.4 STRATEGIC PRIORITY 4 – NATIONAL HOLISTIC APPROACH FOR POLICY COHERENCE

Current status

At the regional level, work has been ongoing for many years to promote ocean governance within the Wider Caribbean (CLME, 2013). This effort has promoted ocean governance through a Caribbean Large Marine Ecosystem (CLME) approach, and underscores the need for an inter-sectoral approach to sustainable fisheries management at both the national and regional levels. In the Eastern Caribbean, the Organisation of Eastern Caribbean States (OECS) adopted an ocean governance policy and strategic action framework, the *Eastern Caribbean Regional Ocean Policy* (ECROP) for guiding harmonised development of the blue economy within the OECS sub-region (Reynard and Walker, 2021), consistent with the provisions of the Revised Treaty of Basseterre (OECS 2010). ECROP is supported, in turn, by individual country-level national ocean policies (NOPs) and strategic action plans (e.g. Anon., 2019).

The OECS NOPs share a common template and are guided by several principles, including ecosystem-based management, the use of sound science, application of the precautionary approach, and public and private participation in governance (Singh-Renton, in prep.). Moreover, each NOP, including Grenada's NOP (Anon. 2019) identifies a suite of policy outcomes for various economic sectors, requiring a 'whole-of-government' policy/ management cycle approach. Furthermore, Grenada's NOP notes the intention to establish a National Ocean Governance Committee (NOGC) to facilitate the necessary inter-sectoral coordination and ensure greater policy coherence for the management of Grenada's marine space (op. cit.).

When established and actively implemented, the NOGC is the most suitable body to deliver a coordinated 'whole-of-government' (inter-sectoral) policy/ management cycle, and to serve as a platform for integrating the fisheries sector's interests within the overall national social and economic development framework. By this means, the fisheries sector can achieve synergies to boost results for the sector's ongoing development and associated benefits, e.g. synergies to explore new export markets, sustain a successful path toward product quality and diversification, enhance livelihood and social protection outcomes. In the case of the tuna fishery, these synergies are needed to safeguard current investments through an improved, holistic approach to ICCAT participation, and to strengthen the focus of tuna industry development and diversification towards an improved, acceptable balance of social and economic benefits.

Besides the NOGC, the Fisheries Advisory Committee (FAC) also has capability to facilitate inter-ministerial/ inter-sectoral coordination, but has not been active in recent years (CH Business Consulting 2024b). The FAC can facilitate membership and participation from other government ministries, as well as from non-governmental organisations and the private sector. The fisheries legislation makes formal provisions for the operation of the FAC, and hence it may be the best current option to support a required inter-ministerial collaboration arrangement (op. cit.). Additionally, external experts can be engaged to contribute to FAC activities, as required.

Strategic priority summary

It is assumed that the government of Grenada remains committed to the concept of the NOGC for effective implementation of ECROP. This suggests that the NOGC, once established and operational, would serve as the inter-ministerial coordination mechanism on ocean governance. When this happens, the FAC can represent the fisheries sector's interests within the NOGC, and both can be supported by scientific and policy/management expertise to carry out the range of technical and management tasks. The FAC can be supported directly by the ICCAT WG (proposed under Strategic Priority 2), which can use scientific and management experts for implementation of the tuna fishery policy/ management cycle, and which can make proposals for synergies achievable through inter-ministerial collaboration. As needed, specific inter-ministerial task forces, or working groups can then be charged with the implementation of these proposals.

Until the NOGC is fully active, the FAC should be revived and set up to coordinate a 'whole-of-government' approach for and on behalf of the tuna fishery sub-sector. To achieve this, it is essential that the FAC membership includes ministries and national institutions with overlapping objectives/ interests. National ministries and institutions with potential overlapping objectives/ interests include, at minimum, those responsible for: social protection, trade and economic development, seafood quality control standards,

maritime security, marine conservation and disaster and emergency risk management. The ICCAT WG would carry out the same supporting functions, as in the case of the NOGC setup.

Important issues for the 'whole-of-government' approach are the fisheries sector's capacity to sustain and increase its contributions to national social and economic development. In the case of the tuna fishery, this is expected to include examination of feasible options for sustainable industry development and diversification, foreign direct investment and associated international donor support.

2.1.6.4.1 GOAL/ OUTCOMES

The long-term goal/outcome that represents the desired state is:

- A 'whole-of-government' approach for integration and enhancement of sustainable tuna fishery development outcomes through a holistic approach to ICCAT participation.

The intermediate outcome, aimed at reflecting improvements in public and private sector behaviours and practices required for the desired long-term outcome, is:

- Improved public-private governance arrangements, behaviours, and practices for ensuring a 'whole-of-government' approach for integration and enhancement of sustainable tuna fishery development outcomes through a holistic approach to ICCAT participation. The following improvements contribute to this outcome.
    - The NOGC holds regular meetings, facilitates both scientific and management inputs/ activities to inform its plans and decisions, and provides feedback to stakeholders. [*Actions provided in Anon. 2019*]
    - The FAC is active and includes among its membership key members from other ministries with objectives/ interests that overlap with those of the Fisheries Sector. [*Extension of FAC requirements defined under Strategic Priority 3*]
    - The ICCAT WG includes among its membership key members from other ministries with objectives/ interests that overlap with those of the tuna fishery sub-sector. [*Facilitated under Strategic Priority 2*]
    - The FAC and ICCAT WG are adequately managed and supported by technical, financial and human resources for evidence-based management of an active, holistic tuna fishery policy/ management cycle. [*Facilitated under Strategic Priority 1*]
    - The FAC and ICCAT WG provide evidence-based policy, management and technical guidance and inputs on tuna fishery initiatives with potential for advancing development and diversification of the industry. [*Facilitated also under Strategic Priority 1*]
    - The FAC and ICCAT WG actively and routinely produce evidence-based reports and other communication, education and outreach products to demonstrate achievements by the tuna fishery of a sustainable balance of social, economic and environmental outcomes. [*Facilitated under Strategic Priority 1*]
    - Tuna fishery development and diversification initiatives enjoy practices that promote the social and economic goals of the 2030 Agenda for Sustainable Development [*Facilitated under Strategic Priority 2*]

Immediate outcomes that reflect new and improved knowledge, skills and capacities required to realise desired arrangements, behaviours and practices are:

- NOGC established, with adequate membership across ministries affected by or influencing ocean governance, and NOGC functions identified and agreed. [*Actions proposed by Anon. 2019*]
- FAC revived, and with membership including ministries and national institutions with overlapping objectives/ interests in: social protection, trade and economic development, seafood quality control

standards, maritime security, marine conservation and disaster and emergency risk management. [*Extension of FAC membership and role defined under Strategic Priority 3*]

- The ICCAT WG established, with a facilitation to include technical/scientific and management contributions from other ministries and national institutions. [*Facilitated under Strategic Priority 2*]
- Strengthened technical/ scientific, team leadership and management skills and capacities of FAC and the ICCAT WG for successful, implementation of a 'whole-of-government' approach for the tuna fishery policy/management cycle. [*Extension of training addressed under Strategic Priorities 1 and 2*]
- Strengthened skills and capacities of FAC and ICCAT WG to provide multi-disciplinary evidence-based management guidance for tuna fishery development and diversification and to account for balanced achievement of social, economic and environmental outcomes. [*Extension of training addressed under Strategic Priority 1*]
- Strengthened skills and capacities of FAC and ICCAT WG to develop tuna fishery communication, education and outreach products for various publics. [*Extension of training addressed under Strategic Priority 1*]
- Improved institutional capacity and arrangements in place for guiding sustainable tuna fishery development and diversification, in accordance with the 2030 Agenda for Sustainable Development.

Outputs required to deliver increased knowledge, skills and capacities are:

- Proposal for NOGC, with agreed inter-ministerial membership and an established time-based policy/ management cycle of activities, and supported by technical/ scientific and management experts from the various member ministries. [*Actions provided in Anon. 2019, with specific tuna fishery sub-sector representation addressed here*]
- Proposal for FAC, with agreed inter-ministerial membership and an established time-based policy/ management cycle of activities, and supported by technical/ scientific and management experts from the various member ministries and key national institutions. [*Extension of FAC membership and role defined under Strategic Priority 3*]
- Proposal for ICCAT Working Group, with inter-ministerial representation facilitated, as well as representation from key national institutions. [*Addressed under Strategic Priority 2*]
- Improved evidence base, and strengthened data analysis and scientific capabilities for the NOGC, FAC, and ICCAT Working Group. [*Extension of training addressed under Strategic Priority 1*]
- Strengthened skills in team leadership and management of senior members of FAC and ICCAT Working Group. [*Extension of training addressed under Strategic Priority 2*]
- Formal NOGC/FAC ICCAT inter-ministerial coordination mechanism arrangement to oversee tuna fishery development and diversification initiatives, and provide guidance on sustainable industry practices for achieving social and economic goals embodied in the 2030 Agenda for Sustainable Development.[*Linked to the proposed ICCAT inter-ministerial coordination arrangements for information sharing addressed under Strategic Priority 1*]

2.1.6.4.2 OBJECTIVE AND SUPPORTING ACTIONS

2.1.6.4.2.1 Objective 4.1 and actions

Objective 4.1 – To include formal tuna fishery sub-sector representation within the NOGC if/ when fully operational, through the FAC and its ICCAT WG.

Key Actions

4.1.1. NOGC is to establish policy/management cycle for ocean governance. [*Actions provided in Anon. 2019*]
4.1.2. Fisheries Division is to facilitate representation of sub-sector interests through participation in the NOGC by the FAC, supported by the ICCAT WG.
4.1.3. The ICCAT WG is to use scientific and management experts for implementation of the tuna fishery policy/ management cycle, and for informing proposals for synergies achievable through inter-

ministerial collaboration. As needed, specific inter-ministerial task forces, or working groups can then be charged with the implementation of these proposals.

2.1.6.4.2.2 Objective 4.2 and actions

Objective 4.2 – To include inter-ministerial membership within the FAC and establishment of an ICCAT inter-ministerial coordination mechanism for facilitating a 'whole-of-government' approach in the implementation of the tuna fishery policy/management cycle.

Key Actions

4.2.1. Besides membership considerations proposed under Strategic Priority 3, FAC membership would need to be extended to include ministries responsible for health, foreign affairs, trade, finance, business development, social protection, national security, maritime security, marine conservation, disaster and emergency management. Membership should also be considered for key national institutions, e.g. the Produce Chemist's Laboratory, Bureau of Standards, Grenada Solid Waste Management, and SGU's Marine and Wildlife and Conservation Biology Department, and public private partnership (PPP) arrangements that are directly involved in tuna fishery sub-sector activities, e.g. GrenadaGrows.

4.2.2. An ICCAT inter-ministerial coordination mechanism is to be established by the FAC, with membership similar to the FAC. Tasks of the ICCAT Inter-ministerial coordination mechanism are to be supported by the ICCAT WG and are to include, at minimum:

(i) Convening of regular meetings, at least quarterly, for information and knowledge exchange, particularly scientific and management updates as these relate to ICCAT participation, tuna fishery contributions to national objectives, and tuna fishery development and diversification potential.

(ii) Use of evidence base to evaluate and inform national positions regarding ICCAT cooperation.

(iii) Use of evidence base to propose synergies achievable through inter-ministerial collaboration. As needed, specific inter-ministerial task forces, or working groups can then be charged with the implementation of these proposals. This can inform inter-ministerial cooperation for a holistic approach to:

a. addressing multiple objectives, particularly considering ongoing challenges of climate change, social protection, gender equity and other human rights issues, and multiple sector participation in the blue economy.

b. oversee tuna fishery development and diversification initiatives, with immediate emphasis on improving value chain design and management, and provide guidance on sustainable industry practices for achieving social and economic goals embodied in the 2030 Agenda for Sustainable Development [*see detail under objective 4.4.*].

(iv) Use of evidence base to identify and pursue required policy reforms to facilitate private sector and foreign direct investment, as needed, for industry development and diversification.

(v) Use of evidence base to develop national positions on international donor support in linked areas of social and economic development.

(vi) Documentation of decisions and communication of decisions with stakeholder community and the wider public in accordance with general, routine communication, education and outreach activities.

2.1.6.4.2.3 Objective 4.3 and actions

Objective 4.3 – To strengthen Fisheries Division, FAC and ICCAT WG skills and capacities in fisheries management science, team leadership, team management, and communication and reporting.

Key Actions

4.3.1. Design and deliver a suitable training programme for strengthening Fisheries Division, FAC and ICCAT WG skills and capacities to improve understanding of fisheries management science products.

4.3.2. Design and deliver a suitable training programme for strengthening senior-level Fisheries Division, FAC and ICCAT WG skills and capacities in team leadership and management.

4.3.3. Design and deliver a suitable training programme for strengthening Fisheries Division, FAC and ICCAT WG skills for preparing tuna fishery communication, education and outreach products for various publics.

2.1.6.4.2.4 Objective 4.4 and actions

Objective 4.4 – NOGC/FAC ICCAT inter-ministerial coordination mechanism to oversee tuna fishery development and diversification initiatives, with immediate emphasis on improving value chain design and management, and providing guidance on sustainable industry practices for achieving social and economic goals embodied in the 2030 Agenda for Sustainable Development.

Key Actions

4.4.1. NOGC/FAC ICCAT inter-ministerial coordination mechanism is to:

(i) Consider and pursue the establishment/use of suitable public-private sector partnerships to work with and support the NOGC/ FAC's work on tuna fishery development and diversification initiatives, and achievement of balanced outcomes under the 2030 Agenda for Sustainable Development.

(ii) Provide guidance on sustainable industry practices for existing tuna fishery value chains and identify options for improvement/ development and diversification;

(iii) Support and guide initiatives for realising tuna fishery value chain improvement/ development and diversification options.

(iv) Support the conduct of an audit of tuna fish waste to determine suitable options for management and minimisation of this waste;

(v) Support and guide initiatives to explore alternative uses of inedible tuna fish waste, and provide guidance on options for promoting youth and women involvement in the sub-sector.

2.1.7 ROLES AND RESPONSIBILITIES

Public sector

The Fisheries Division, under the direction of the Ministry of Agriculture & Lands, Forestry & Marine Resources, is the competent national authority for fisheries sector management. In the case of the present strategy, the Fisheries Division is expected to lead all tasks. Ideally, the Fisheries Division should be supported by the FAC in this leadership role.

The NOGC has been proposed for coordination of Grenada's National Ocean Policy, with its establishment originally planned for completion in 2020 (Anon. 2019). At this time, it is not clear if the NOGC is operational and the NOGC was not mentioned during national-level consultation sessions for development of the present ICCAT Strategy (CH Business Consulting 2024b). In the absence of the NOGC, an alternative arrangement is required to advance inter-ministerial coordination for and on behalf of the tuna fishery sub-sector.

As noted earlier, the 1986 Fisheries Act and 1987 Regulations make distinct provisions for the establishment of a FAC, FAC serving members and FAC functions. According to the 1987 Regulations, the FAC can advise the Minister on: proposals for access agreements, development projects, joint investment ventures, regional harmonisation of fisheries management actions, and inter-ministerial policy and activity coordination. These areas of focus suggest that the FAC can engage an inter-ministerial group to assist it with generation of advice that considers all relevant perspectives. The FAC is currently inactive, but its potential to host inter-ministerial membership has been confirmed (CH Business Consulting 2024b). In view of this, the FAC can play a crucial role in supporting the Fisheries Division for implementation of the present strategy.

Once revived, the FAC can have the responsibility for establishing the ICCAT WG to afford equitable tuna fishery stakeholder representation, and for establishing the ICCAT Inter-ministerial coordination mechanism to afford a 'whole-of-government' approach for continued and improved, sustainable development of the tuna fishery sub-sector.

The ICCAT Inter-ministerial coordination mechanism is expected to include representatives from several ministries to ensure that policy and management decisions on tuna fishery management and development are aligned across the social, economic and environmental dimensions for balanced and sustainable outcomes that comply with international standards and agreed goals. Moreover, such inter-ministerial collaboration offers strong potential to achieve synergies for enhanced results, including *inter alia*: by collective attention to address common needs and efficiency in use of all relevant programmes, projects, and resources; by collaboration in sharing data and information; by collaboration for a multi-disciplinary approach to data analysis to optimise the trade-offs among ministry/ sector objectives for the best possible sustainable balance of positive social, economic and environmental impacts.

Each ministry, which is expected to serve on the FAC, is responsible for its individual contribution towards more enhanced results. For example, the Ministry of Trade can seek to have the tuna fishery included in export market and product research and market diversification studies, which may not happen without collaboration and joint information sharing about project opportunities. The Ministry of Health is the Competent Authority for fish and fishery products in Grenada, and so should be fully engaged on matters pertaining to value chain management, particularly fish handling and quality control. This includes initiatives aimed at reducing tuna fish waste management through poor product handling. Initiatives focused on capacity building should strive to include all the relevant ministries, e.g. value chain management training for the tuna fishery is expected to include not only fisheries sector participants, but representatives from the Ministry of Health and key supporting national institutions such as Produce Chemist's Laboratory, and the Bureau of Standards. By this means, these other national partner ministries and institutions can become more knowledgeable on fisheries sector needs, and respond more meaningfully to fisheries sector requests for support and advice.

Private sector

The private sector's role involves the direct investments required to realise the anticipated social and economic development and to adjust industry practices for outcomes that are balanced also with environmental goals.

For implementation of the present strategy, the fisherfolk organisations/ cooperatives and the ICCAT WG serve as the platforms for private sector participation in the formal national fisheries policy/ management process. In the case of the fisherfolk organisations, these require capacity building for team leadership and management, conflict resolution, and capacity to attract broader membership and participation, especially by vulnerable groups.

The fisherfolk organisations and cooperatives, together with other tuna fishery stakeholder groups such as market vendors, exporters and processors, are expected to collaborate with each other on tuna fishery issues as members of the ICCAT WG. Many women work in the sector as informal labourers. Special efforts may be required to ensure their inclusion and participation in the ICCAT WG. The Fisheries Division is also expected to have permanent representation in the ICCAT WG, in view of its responsibility for the evidence base and generation of policy/ management advice. Data analysis and research experts who may be proposed by national and regional partner institutions, are expected to assist the ICCAT WG in data analysis and development of policy/ management advice.

2.1.8 FINANCING OPTIONS

The Think Tank on ICCAT has proposed several financing opportunities through engagement with international donors (CH Business Consulting 2024b). These are listed here.

(i) The Compete Caribbean Partnership Facility (CCPF) has been supported by several international donors that include the UK and Canadian governments of Canada, the Caribbean Development Bank and the Inter-American Development Bank. The CCPF is concluding its current phase of projects, but a new phase is possible, and could be a source of funding to support strategy implementation. In view of specific

development interests by the various donors, certain initiatives could benefit from single donor support as well.

(ii) ICCAT has special funds to support meeting attendance by its members which are developing states. In the case of Grenada, the US delegation to ICCAT is committed to assist in accessing this assistance to support Grenada's attendance at ICCAT meetings.

(iii) The Deepwater Horizon Recovered Oil Fund is interested in undertaking data and research studies to improve understanding of tuna fishery performance in the Caribbean region.

(iv) FAO's Climate Change Adaptation in the Eastern Caribbean Fisheries Sector (CC4FISH) Project is being funded to support data improvement work.

(v) The International Pole and Line Foundation (IPNLF) manages a special fund to support ICCAT participation by Small Island Developing States (SIDS).

In view of the many donor-supported opportunities, inter-ministerial coordination and synergy are necessary to maximise the possible benefits (op. cit.).

At present, the government of Grenada is making an investment to recruit new staff for the Fisheries Division. This is intended to strengthen the institution's capacity to address the increasing fisheries management and development demands, including effective ICCAT participation in the future.

2.1.9 CHAPTER BIBLIOGRAPHY

Anon. (1986). *Grenada Fisheries Act*. Act No. 15 of 1986

Anon. (1987). *Grenada Fisheries Regulations 1987.* Statutory Rules and Orders No. 9 of 1987.

Anon. (2019). *Grenada National Ocean Policy*. Government of Grenada. https://oecs.int/en/our-work/knowledge/library/ocean-governance/grenada-national-ocean-policy [Accessed 2 October 2024]

CARICOM (2014). *Annual Report of the Caribbean Regional Fisheries Mechanism (CRFM) on behalf of CARICOM*, p 554-560, In Report for biennial period, 2014-15 PART I (2014) - Vol. 3 Annual Reports. Madrid, Spain, ICCAT.

CH Business Consulting (2024a). *ICCAT Compliance Documents*. Portugal, CH Business Consulting.

CH Business Consulting (2024b). *Grenada ICCAT Strategy Think Tank – Meeting Reports*. Portugal, CH Business Consulting.

CLME. (2013). *The Strategic Action Programme for the sustainable management of the shared living marine resources of the Caribbean and north Brazil shelf large marine ecosystems (CLME+ SAP)*. Cartagena, UNEP. 143 pp. www.clmeproject.org/download/sap/ [Accessed 2 October 2024]

CRFM. (2012). Diagnostic Study to Determine Poverty Levels in CARICOM Fisheries Communities, Technical Document. CRFM Technical & Advisory Document – Number. 2012 / 3. Volume I, 398p.

CRFM, (2013). Report of the CRFM - JICA CARIFICO / WECAFC - IFREMER MAGDELESA Workshop on FAD Fishery Management, 09 - 11 December 2013, St. Vincent and the Grenadines. *CRFM Technical & Advisory Document*, No. 2013 / 9. 42p.

CRFM, (2017). Report of the CRFM / CARIFICO Seminar: Strengthening Fisheries Co-management in the Region. *CRFM Technical & Advisory Document*, No. 2017 / 4. 68p.

CRFM, (2021). *CRFM Statistics and Information Report – 2020*. Belize City, Belize, CRFM. 92pp.

Gentner, B., Arocha, F, Anderson, C., Flett, K., Obregon, P. & van Anrooy, R. (2018). *Fishery performance indicator studies for the commercial and recreational pelagic fleets of the Dominican Republic and Grenada*. FAO Fisheries and Aquaculture Circular No. 1162. Rome, FAO.

ICCAT (1996). *Report for Biennial Period 1994-95, Part II (1995), Vol. 2, English Version, SCRS*. Madrid, Spain, ICCAT.

ICCAT (2018). *Report for biennial period, 2016-17 PART II (2017) - Vol. 3*, Annual Reports. Madrid, Spain, ICCAT.

ICCAT (2019a). Basic Texts. Madrid, Spain, ICCAT.

ICCAT (2019b). *Report for biennial period, 2018-19 PART I (2018) - Vol. 3*, Annual Reports. Madrid, Spain, ICCAT.

ICCAT (2000). *Report for Biennial Period 1998-99, Part II (1999), Vol. 2, English Version, SCRS*. Madrid, Spain, ICCAT.

ICCAT (2023). *Report for biennial period, 2022-23 PART II (2023) - Vol. 3*, Annual Reports. Madrid, Spain, ICCAT.

ICCAT (2024). *Report for Biennial Period 2022-23, Part II (2023), Vol. 2, English Version, SCRS*. Madrid, Spain, ICCAT.

Isaac, C. J. (2014). *National Report of Grenada*. In Report of Tenth Annual CRFM Scientific Meeting – Kingstown, St. Vincent & the Grenadines, 10-17 June 2014 - National Reports. CRFM Fishery Report – 2014. Volume 1, Suppl. 1. 48p.

Mangi, S. and Townhill, B. (2019). *COAST Insurance: An Assessment of Grenada's Fisheries Sector*. World Bank Report.

OECS (2010). *Revised Treaty of Basseterre establishing the Organisation of Eastern Caribbean States Economic Union*. https://oecs.int/en/our-work/knowledge/library/legal/revised-treaty-of-basseterre [Accessed 2 October 2024]

Renard, Y. & Walker, L. (2021). *End-of-Project Review and Evaluation of the Caribbean Regional Oceanscape Project (CROP)*. 104 pp. OECS, St. Lucia.

Rennie, J. (in prep). Historical Development of the Fisheries Over the Past two Decades. CRFM Scientific Conference, in press, CRFM, Belize City, Belize.

Sieben, C. and Gascoigne, J. (2021). Grenada pelagic longline, troll and dropline Atlantic Ocean yellowfin and bigeye fishery – Marine Stewardship Council pre-assessment report. *FAO Fisheries and Aquaculture Technical Paper* No. 673. Rome, FAO.

Singh-Renton, S. (in prep). *Best Practices of Anchored Fad Fisheries Volume V – Anchored FAD Fisheries Governance with application to other Fisheries in the Wider Caribbean*. Western Central Atlantic Fishery Commission. Bridgetown.

World Bank (2019). *COAST Insurance: An Assessment of Grenada's Fisheries Sector*. Washington, USA, The World Bank.

WTO, 2019. Agreement on Fisheries Subsidies. Adopted at the 12th Ministerial Conference (MC12) on 17 June 2022.

2.2 GRENADA LONGLINE BAIT USAGE ASSESSMENT

2.2.1 GRENADA BAIT USAGE

The three main bait species used in the Grenada longline (LL) fishery are flying fish (*Hirundichthys affinis*), bigeye scad (*Selar crumenophthalmus*) and Atlantic threadfin herring (*Opisthonema oglinum*). Flyingfish have been the traditional bait used, which occurs seasonally in Grenadian waters during the period of October through June. Longline fishers also purchase imported threadfin herring (Gentner et al. 2018) used as chum to catch flyingfish or (infrequently) as bait, themselves. Alternatively, fishers may deploy drifting gillnets during longline fishing trips to catch flyingfish. If flyingfish are unavailable, longline fishers purchase bigeye scad caught in the local inshore beach seine fishery and kept alive in seapens. There is a local market for flyingfish and bigeye scad and, thus, landings of those species for that market are recorded to some extent. However, there is no monitoring in place for any of these bait fisheries. The amount of bait use varies significantly between longline operators ranging from 200 fish per day on the smaller vessels to 900 fish per set on the larger ones (Sieben and Gascoigne 2021). They also note that "…bait use in longline fisheries tends to make up a significant proportion of the total longline catch, likely exceeding the 5 percent threshold applied by MSC to 'main' species." In the following section, we provide some quantification of the likely scale of annual bait usage in the Grenada longline fishery.

The basic approach to estimating annual bait usage is to estimate the number of hooks set per year and then multiplying by the average weight of a baitfish set on each hook. A simple method to estimate annual hooks set is to divide the annual catch of YFT of the Grenada LL fishery (or annual catch of pelagics) by the catch per hook of YFT (or pelagics). Alternatively, hooks per year might be estimated more directly (sets/trip, hooks/set, trips/year and number of vessels for each of the main three LL vessel types). In the latter case, there is information available on the average number of hooks per set by vessel type and number of vessels by type (Rennie 2024 pers comm). But this method requires information on the number of sets per trip and per year for each vessel type and that data is not available. However, there was a project (Samalsingh et al. 2005) that provided catch of YFT and pelagics per set and per hook in the developing Grenada longline fishery. These catch rates may be used to estimate hook usage. Thus, we have opted to use the former approach (annual YFT catch/annual catch per hook of YFT times baitfish weight). This method uses the current yellowfin catches it is estimating the current annual bait usage. The number of hooks used per year is estimated by dividing the kg of yellowfin catch per hook (from Samalsingh et al. 2005) by the annual catch kg of yellowfin. Then the number of hooks is multiplied by the weight of a baitfish on each hook resulting in the aggregate annual baitfish usage.

First consider the expected weight per fish for each of the three baitfish species. The common metric for flyingfish is "3 per pound" (Medley et al. 2010) which equates to 0.15 kg/fish. This is consistent with a 23 cm fish (Fishbase). Additionally, 0.15kg/fish is consistent with estimates for comparable length fish of bigeye scad and Atlantic threadfin herring (Fishbase). Thus, as an initial estimate, that metric is used for kg/fish for all bait species. Second, Samalsingh et al. (2005) reported on the developing longline fishery in Grenada, following that progress from 1982-93. They reported on the catch per trip of YFT and YFT, BUM and SAI combined, as well as the number of hooks per trip for several stages of the project. From their Table 1 there were three stages of the project with differing vessel characteristics: stage one wooden vessels with box and line gear type setting an average of 45 hooks/set; stage two fiberglass, box and line, 45 hooks per set; and stage 3 fiberglass, line and reals, 110 hooks per set. The catch (kg) per hook of "targeted" species (YFT, BUM and SAI) and for YFT alone are in their Figure 8. Recent landings of YFT, BUM and SAI from Grenada come from the Task 1 database of ICCAT. The mean over the three stages of catch per hook of YFT+BUM+SAI from these data was 1.138 kg/hook (standard deviation 0.187. The aggregate usage (Table 1) is for all bait species and no attempt was made to disaggregate the estimates into the three bait species.

Year	Task 1 Grenada Catch of YFT ICCAT (mt)	Task 1 Grenada Catch of YFT, BUM. SAI ICCAT (mt)	Est Annual Bait Usage (mt)	Estimated hooks set/yr (x 10^3)	kg YFT/kg bait
2015	1108	1369	180	663	6.14
2016	1535	1721	227	833	6.77
2017	1177	1384	182	670	6.45
2018	1297	1492	197	722	6.60
2019	708	874	115	423	6.15
2020	739	876	115	424	6.40
2021	287	366	48	177	5.95
2022	957	1034	136	501	7.02
Approx mean			150		
Approx Coefficient of Variation			40%		

Table 1 - Approximate estimates of bait usage in the Grenada longline fishery. Grenada Catch of YFT, BUM. SAI (mt). Catch of YFT, BUM and SAI from ICCAT Task 1 database; Catch per hook of YFT+BUM+SAI from Samalsingh et al. 2005 (mean 1.138/hook standard deviation 0.187.

These estimates are meant to provide a broad understanding of the scale of bait usage in the LL fishery, thus less confidence can be placed on individual annual estimates. The statistics make a number of assumptions:

that size of individual bait fish is around 0.15 kg;

that the current catch of target species per hook has not deviated much from the 1990's and that it does not deviate much between vessel types;

that there is one baitfish used for each hook that is set (ignores when fishers have fewer baitfish than hooks or when there are more baitfish than hooks and the excess baitfish are discarded);

that there has been relatively little variation in hooks/set over time within a vessel type; and other issues.

Of these the assumption of ~1.138 kg of target species catch per hook is probably (assumption 2) is the most suspect for at least two reasons. One reason is that the original Samalsingh report does not indicate if the catches that are recorded were in whole weight or gilled and gutted weight. We have assumed they were in whole weight. However, the report describes the gutting at sea, so it is unclear if the conversion to whole weight was made. If, in fact, the catches were in gutted weight, then the estimates of bait usage would increase by about 20% (the conversion rate to whole fish). The second reason is that the Samalsingh study took place in the 1990's and catch efficiencies may have changed since then. In the future, if bait usage is to be quantified more precisely, there needs to be a concerted effort to associate hook usage with individual catches and trips (perhaps through a logbook or more usefully, an electronic logbook associated with a phone app). Thus, we suspect that the coefficient of variation is underestimated. Nevertheless, these results indicate a "rule of thumb" that at least 1 kg of baitfish is needed to realize a catch of 6-7 kg of yellowfin. Also, results indicate that baitfish usage likely exceeds 5% of the yellowfin catch and of the aggregate of YFT, BET, SKJ, BUM and SAI. Nevertheless, these data provide a basis for evaluating likely impacts of the fishery on regional and national baitfish resources.

2.2.2 REGIONAL CARIBBEAN BAIT USAGE

In order to evaluate the possible usage of bait in the Caribbean region Table 2 gives the recent reported catches of YFT for six Caribbean countries including Grenada. If all of the YFT catch from these countries were obtained from similar gears and baiting practices, then using a "6-7 kg rule of thumb" implies that average annual YFT catches of 2958 mt are supported by annual bait usage of 423-493 mt. However, it is unclear what baiting practices occur, especially for the Trinidad and Tobago catches. In any case, this implies a regional usage of less than 700 mt annually. (the highest entry in Table 2 is 3797 mt total YFT catch divided by 6 is less than 700 mt). As discussed previously, these estimates rely on a number of assumptions. Nevertheless, the estimates provide a first approximation of usage.

Year	Barbados	Dominica	Grenada	Saint Kitts and Nevis	Saint Vincent and the Grenadines	Saint Lucia	Trinidad and Tobago	Total	Bait Usage (mt) using rate 6	Bait Usage (mt) using rate 7
2015	262	194	1167	1	153	175	1179	3131	522	447
2016	324	179	1607	5	434	191	1057	3797	633	542
2017	270	209	1257	29	772	232	890	3659	610	523
2018	248	116	1391	13	373	199	1214	3555	593	508
2019	121	180	818	1	105	172	982	2379	396	340
2020	173	120	784	6	226	190	973	2471	412	353
2021	213	75	287	0	104	156	1244	2078	346	297
2022	202	75	957	0	104	174	1080	2592	432	370
Average	227	143	1033	7	284	186	1077	2958	493	423

Table 2 - Reported catch of yellowfin tuna from Caribbean countries. Rates of usage of 6 or 7 kg of YFT per kg of bait are presented as examples

2.2.3 OTHER CARIBBEAN REGIONAL SOURCES OF MORTALITY ON BAIT SPECIES

Reported landings of the flyingfish and bigeye scad species within the Caribbean region from the FAO database (FishStatj) are shown in Figure 1. Note that these data are reported landings and some countries might not fully report. For example, there are no reported catches of flyingfish from Trinidad and Tobago in this database (although they do report a large catch of aggregated species). However, persistent conflicts between Barbados and Tobago fishers over flyingfish access (Fraser 2024) suggests that Trinidad and Tobago would have been exploiting the flyingfish resource to some extent. Also, it is unlikely that bait usage is being fully reported or reported at all. Additionally, it has been noted in multiple publications (e.g. Gentner et al 2018, Fraser 2024, Sieben and Gascoigne 2021, CRFM 2014, 2018) that the catch of targeted fisheries for flyingfish (primarily from Barbados) has declined substantially. Hypotheses for the cause of this includes a shift in the flyingfish distribution and/or the interaction of the fishers and their gear with the proliferation of Sargassum throughout the Caribbean.

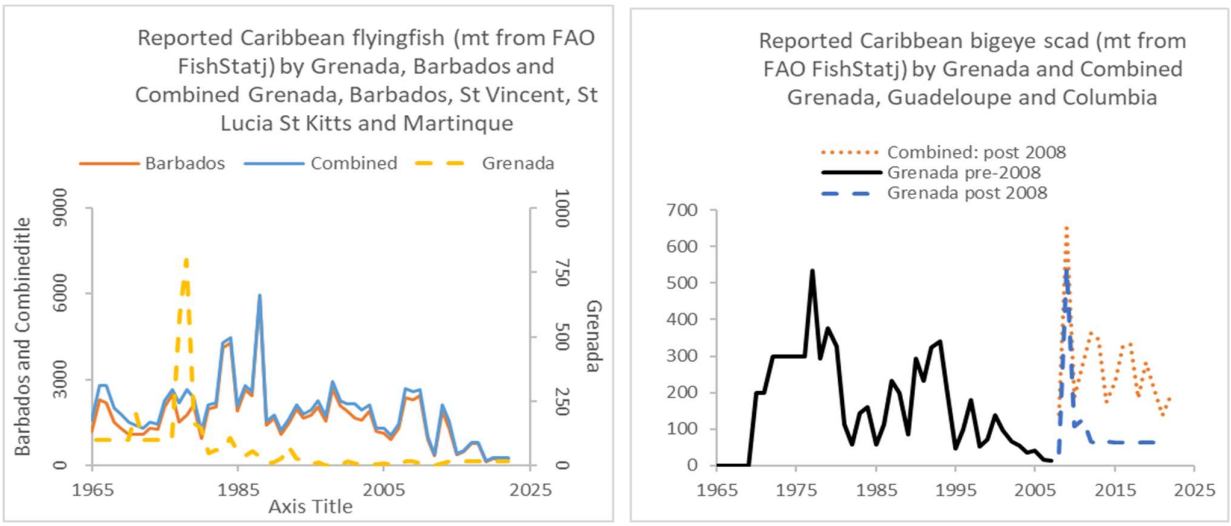


Figure 1 - Reported Caribbean catches of flyingfish and bigeye scad

From Figure 1, the directed flyingfish fishery experienced annual catches of approximately 2500 mt for more than four decades. The decline in catches since ~2008 may have been accompanied by an increased usage of flyingfish as bait in the regional longline fisheries as that fishery developed. However, it has been noted previously that that usage has decreased. Thus, even if all the bait usage now were flyingfish (which it is not; most of the bait used now is bigeye scad, Gentner et al 2018) and given the likely bait usage in the region (Table 2), it is very unlikely that current annual fishing mortality exceeds the 2500 mt that the directed fishery experienced in the past over many years.

The statistics on bigeye scad are more equivocal (Figure 1 right panel). Reported catches seem to be more ad hoc with reports from most Caribbean countries not appearing in the database. Grenada reported annual catches have declined over the years.

2.2.4 Assessment of Bait Species

2.2.4.1 Flyingfish

Medley et al. 2008 assessed the regional status of flyingfish through a working group of regional experts on the fisheries and flying fish biology. Total catches were compiled from Barbados, Dominica, Grenada, Saint Lucia, Saint Vincent, and Tobago. These catches were considered to be the best estimates available, but were probably not highly accurate. In particular, it was noted that catches used for bait were poorly recorded but preliminary estimates were made by the working group based on the available data and their local knowledge. Catch and effort data were available from Barbados, Tobago and Saint Lucia. These data were combined into a single standardized index of abundance using a generalized linear model. The index covered 1988-2008, whereas the catch data at that time extended from 1950 to 2008.

Medley et al. 2008 provided a synopsis of the biology of the four wing flyingfish as it relates to the construction of stock assessment analyses which is summarized here. The flyingfish is a short-lived, essentially annual species with a maximum age of around 18 months and grows relatively fast (best estimates of standard von Bertalanffy growth parameters are: L = 24.5 cm FL, k = 0.01 per day, t0 = 2.85 days. They reach first maturity as small as 18.0 cm FL (around five months of age). The majority of fish are mature by 20.3 cm FL (around seven months of age. Individual fish are believed to spawn several times within the November to July spawning season. Eggs are non-buoyant and highly adhesive, and are spawned on floating materials including natural flotsam and the fish aggregation devices and gillnets used to catch adult flyingfish. Since the average life span is around one year, mortality rates are high (instantaneous annual rates have been estimated to be greater than 1 and as high as 4.4). Flyingfish are patchily distributed across the eastern Caribbean with tagging data demonstrating that individuals move freely between the islands of the eastern Caribbean. Also, survey data from 1988 suggest that

flyingfish are likely to be available in commercially viable quantities beyond range of most local fishing fleets. Given this background, Medley et al. implemented a stock assessment model commonly used with flyingfish (Mahon 1989) with a Bayesian estimation implementation. Note, Bayesian estimation uses prior probability distributions for important parameters based on expert opinion which are statistically adjusted using the data (catch rates and catches) to achieve a "best" final estimate of the parameters. Further discussion of the models are given in the Technical Appendix.

Since the completion of the Medley et al. analysis, the database has deteriorated significantly: directed catches that were reasonably well-reported have declined and catches being used for bait have increased. These bait catches were not monitored. An updated assessment was conducted (CRFM 2019). That analysis assumed that landed (reported) catches post-2008 composed all of the catch and that the catch rates were proportional to the catches, using the prior to 2008 data to obtain the proportionality. That assumption is unlikely to have been true. Instead, we stipulate that the Medley database remains the best available since it included the catches for bait and used considerable expertise is its compilation. The estimated biological parameters of the dynamics prior to 2008 are still useful for interpreting the likely dynamics and status of the stock at this time. Additional analyses were conducted herein (Technical Appendix) to reflect further model testing.

1. The evolution of research since 2008 of appropriate ratios of biomass at maximum sustainable yield to biomass when there was no fishing (i.e. Bmsy/B0) for stocks of specific life histories
2. The interpretation of the Medley results for B0 based upon the ensuing events in this fishery (sargassum/changes in distribution).

The essential results of the analyses both here and in Medley was that the catch rate data during the period prior to 2008 does not contain much information about trend. However, these rate data are important in estimating the intrinsic productivity rate (how quickly the stock grows and declines within a year after the recruitment of eggs to juveniles). A summary of the Medley results medians: Biomass 2007/Bmsy=2.71, MSY=7897mt, B0=26351 mt, 2007 fishing mortality rate relative ti the rate at MSY=0.17, intrinsic rate of annual increase=3.40. Also, these results indicate that BMSY/B0 is 0.35. Recent stock assessment research indicates that even slow-growing multi-cohort stocks have BMSY/B0 ratios of less than 0.35. So, it seems unlikely that 0.35 is appropriate for a single cohort stock. An alternative model that is more flexible was fit where Bmsy/B0 was fixed at 0.2. This resulted in higher MSY levels (Technical Appendix). Nevertheless, the Medley conclusions were aware of this possibility when they made their recommendations which are summarized below.

An improved stock assessment may lead to further international fishing controls. The most significant uncertainty in the current assessment stems from the poor data available on catches and effort. Improved data collection and monitoring is required to ensure sustainable use of this and other fishery resources.

The catch rates (during the time prior to 2008 used in the Medley analysis) were stable overall in the time series as catches increased. Given the potential stock area, and estimates of a relatively large stock size from tagging and survey estimates, it is likely that the potential yield exceeds total catches taken throughout the history of the fishery.

A catch trigger point of 5 000 mt should be established when action may be taken to ensure the stock does not become overfished. The trigger point defines when further management action should be undertaken. The maximum recorded catch has been 4 700 mt. The assessment indicates that any fisheries development exceeding 5 000 mt would have unpredictable consequences. Among the actions that should be taken if catches rise to, or above, the trigger point, are a freeze on further fishery development until a full scientific reassessment of the stock has been completed.

Note that this latter point was a key recommendation of the subsequent draft management plan: "Implementation of a precautionary sub-regional freeze on expansion of flyingfish fishing effort and/or fishing capacity applied to all authorised vessel types, should the agreed catch trigger point be realized, to be followed by reassessment of resource status and adaptive management" (CRFM 2014).

While the flyingfish catch database has deteriorated, the above analysis of bait usage indicates that it is unlikely that recent catches have reached the 5000 mt trigger. Additionally, given the high productivity of flying fish

(intrinsic rate 3.40) and the broad geographical distribution it is unlikely that a stock would not recover quickly given reductions in catches. Thus, we concur with the Medley et al. (2008) recommendations.

2.2.4.2 BIGEYE SCAD

Given the paucity of data on both catches and catch rates, there is no basis for conducting analytic assessments of bigeye scad at this time. However, it is likely that this species is quite productive and has a broad geographical distribution (Sieben and Gascoigne 2021). But the stock tends to be more coastal than flyingfish, being caught by beach seines. At one time a fishery targeting bigeye scad for consumption in Grenada supported annual catches of 200 mt or higher (Figure 1) but have declined. Declines were originally thought to be related to the increasing longline activities and their demands for bait. However, an alternative explanation is that environmental conditions may have changed and could be impacting these resources either their availability close to shore or their actual abundance. Given the analysis of bait usage above, it is entirely possible that current bigeye scad catches are greater than 200 mt. It is recommended that bait usage of bigeye scad be quantified (beyond the cursory analyses of usage above) and that a trigger be established for annual catches with appropriate variation based on those results.

2.2.4.3 THREADFIN HERRING

It is likely that the stock is quite productive and has a broad geographical distribution extending to temperate Atlantic waters in both the northern and southern hemispheres (Sieben and Gascoigne 2021).

Also, it has been indicated that threadfin herring baits are typically imported to Grenada from outside the region. Thus, it is likely that attempts of local management would be fruitless. Nevertheless, it is recommended that the use of this species by the longline fishery be quantified and that these values be compared to the potential catches both within and without the Caribbean region.

2.2.5 ON HARVEST CONTROL RULES AND MANAGEMENT STRATEGY EVALUATIONS FOR BAIT SPECIES

Harvest control rules (HCRs) are prespecified directions to limit fishing mortality rates or catches in response to the status of the stock. For example, Medley et al. suggested the control rule that fishing mortality rates should not exceed 2/3 of the fishing mortality rate at MSY for flying fish. Other examples include reducing the fishing mortality rate below that at MSY proportionally to the ratio of current biomass relative to Bmsy. The CRFM (2014) draft management plan recommendation "…should the agreed catch trigger point be realized, to be followed by reassessment of resource status and adaptive management" is an example of the first step of a control rule.

However, there are characteristics of the longline bait species and the monitoring systems available that should be considered when constructing an HCR. First, the bait species are highly productive, thus both the abundance and the annual catches are expected to be quite variable. If catches exceeded a trigger point in one year due to a large recruitment event, then it would not be unreasonable that the following year would have lower recruitment and lower catches independent of any HCR that might be imposed. In this example by the time a management action to reduce catches could be implemented, the stock had already adjusted. Therefore, there always needs to be a meshing of the timing of the dynamics, the ability to monitor and detect changes in status and the ability to implement management actions.

Ideally, HCRs should be based on biomass indices (such as catch rates). However, with these baitfish species indices are not available. Thus, catch triggers (as in Medley et al. 2008) are what is available. Additionally, the proportional mixture of species in the longline catches might be considered.

Since the bait species are highly dynamic, typically these call for controls on effort (e.g. limiting seasons or trips or access) versus controls on catch such as catch quotas or TACs. These are also referred to as input controls and output controls, respectively.

Given these characteristics, we can foresee a candidate rule in which a catch trigger for each of the species is established. If it is exceeded for "x" consecutive years then the fishing effort be reduced "y" percent. In the case of bigeye scad, that effort might relate to beach seine effort. Additionally, when the bait usage distribution

among the species deviates "substantially" from "the norm", then this might indicate other ecosystem issues and might trigger a reevaluation of the system.

The definition of "x", "y", "substantially" and "the norm" should be examined through management strategy evaluations where the robustness of the rules and their definitions are tested through computer simulations of suites of models reflecting various hypotheses about the dynamics of the baitfish stocks. This activity is well beyond the scope of this consultancy.

Additionally, an HCR and its implementation should consider the ecosystem effects and competing interests of users of Grenadian resources. Still the key issue in successfully implementing an HCR is the ability to monitor catches. It is imperative that baitfish usage be monitored such that appropriate rules can be defined and that eventually stock assessments can be conducted.

2.2.6 CHAPTER REFERENCES

CRFM Fishery Report. 2014. Volume 1, Suppl. 1 – National Reports. Report of Tenth Annual CRFM Scientific Meeting – Kingstown, St. Vincent and the Grenadines, 10-17 June 2014

CRFM. 2019. Fishery Assessment Report - Eastern Caribbean four-wing flyingfish, *Hirundichthys affinis*. CRFM Fishery Report – 2019/2. 224p.

CRFM. 2014. Sub-regional Fisheries Management Plan for flyingfish in the eastern Caribbean. CRFM Special Publication No. 2. 42 p. + annexes.

CRFM. 2021. CRFM Statistics and Information Report – 2020. Belize City, Belize. 92pp.

Fraser, J. 2024. Plenty more flying fish in the sea? Tobago's fears as Bajan boats move in | Global development | The Guardian. Jan 9, 2024.

Gentner, B., F. Arocha, C. Anderson, K. Flett, P. Obregon and R. van Anrooy. 2018. Fishery performance indicator studies for the commercial and recreational pelagic fleets of the Dominican Republic and Grenada. FAO Fisheries and Aquaculture Circular No. 1162. Rome.

Mahon, R. 1989. Developing a management strategy for the flyingfish fishery of the eastern Caribbean. Proceedings of the Gulf and Caribbean Fisheries Institute 39: 389-402.

Medley, P., K. Caesar, P. Hubert-Medar, K. Isaacs, J. Leslie, E, Mohammed, H. Oxenford, C. Parker, P. Phillip, A. Potts, R. Ryan, R. Walters, 2010. Part II: Management Summary and Stock Assessment Report for flyingfish in the eastern Caribbean. *In* FAO Western Central Atlantic Fishery Commission. Report of the Third Meeting of the WECAFC Ad Hoc Flyingfish Working Group of the Eastern Caribbean. Mount Irvine, Tobago, 21–25 July 2008. FAO Fisheries and Aquaculture Report. No. 929. Rome.

Samalsingh, S., H. Oxenford, J. Rennie. 2005. A successful small-scale longline fishery in Grenada. 2222. Proceedings of the Gulf and Caribbean Fisheries Institute 46: 3-21.

Sieben, C., and J. Gascoigne. 2021. Grenada pelagic longline, troll and dropline Atlantic Ocean yellowfin and bigeye fishery: a Marine Stewardship Council pre-assessment report. FAO Fisheries and Aquaculture Technical Paper 673. Rome.

2.2.7 TECHNICAL APPENDIX

The Mahon (1989) population dynamics model used to assess flyingfish Is

$$B_{t+1} = \frac{B_0\, r\, B_t}{B_0 + (r-1)B_t} - C_t \quad \frac{B_{msy}}{B_0} = \frac{\sqrt{r}-1}{(r-1)} \quad MSY = \sqrt{r}\frac{(\sqrt{r}-1)}{(r-1)} \quad equilibrium\ \frac{dB}{dt} = \frac{B_0\, r\, B}{B_0 + (r-1)} - B$$

where B_t is the biomass at the beginning of year t, B_0 is the equilibrium biomass when there is no fishing, r is the intrinsic rate of increase and C_t the catch (wt) in year t. The data observations in Medley et al. (2008) were

time series of catches and standardized catch per effort of Caribbean flyingfish where the catch per effort X_t was modeled as $X_t = qB_t$ where q is a catchability coefficient. The catch per effort data was obtained primarily from the Barbados targeted fishery for flyingfish while the catches were from Caribbean nations' catches plus estimates of Grenada's bait usage at the time. Medley et al. (2008) fit the model to these data using Bayesian methods with prior probabilities on B_0, r and q. The prior on B_0 was based upon a tagging study, the prior on r was based upon life history parameters of growth, mortality and reproduction estimated for flyingfish and the prior distribution of q was assumed to be log-uniform. Additionally, process error was fixed at a relatively high level consistent with a population that exhibits large variability in recruitment. The Medley et al. 2008 results were:

	Prior Median	Posterior Median
r	4.047	3.40
B0 tonnes	~ 220,000	26,351
MSY tonnes		7,897
Bmsy/B0		0.35
B 2007 tonnes		25919
C 2007 tonnes		2512
B/Bmsy		2.71
F/Fmsy		0.17

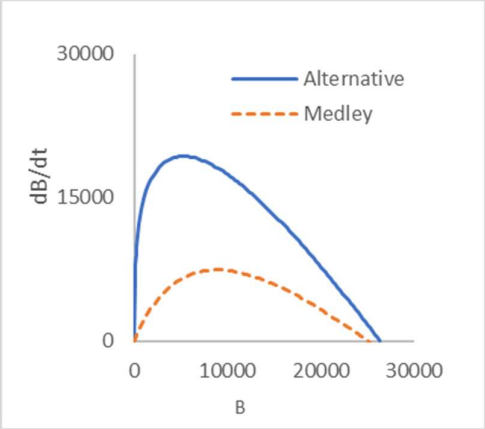
There are several issues with these results that might be explored based upon the history of flyingfish catches subsequent to this assessment in 2008 and also evolving best practices since 2008 when specifying productivity parameters. The first issue is that the prior on B0 was very uninformative: the posterior estimate was an order of magnitude smaller than the prior. These results tell us that the basic catch per effort data are informing us about r, but little else. Additionally, the shifting of the location of catches since the early 2000's and their decline argues that B0 may be much larger. Medley was well aware of this and noted it.

The second issue is the estimate of Bmsy/B0 =35%.. This is contrary to current practices, where Bmsy/B0 of even low productivity age-structured stocks have Bmsy/B0=25%. It would be expected that Bmsy/B0 for a highly dynamic flyingfish species would be lower than 25%. But, this characteristic is a feature of the Mahon model =where Bmsy/B0 is a function of r alone.

As a simple sensitivity test, an alternative model was fit:

$$\frac{dB_t}{dt} = a\,B_t^p - m\,B_t - C_t \qquad B_{msy}/B_0 = \left(\frac{1}{p}\right)^{\frac{1}{(p-1)}} \qquad a = m\,B_0^{1-p}$$

Note that with a judicious choice of p and m, this model can be made to be identical to the Medley results. However, in this test Bmsy/B0 was fixed at 20% and B_0 was fixed at the posterior estimate from Medley, i.e. 26,351 t. This test was designed to explore the effects of an alternative p. The model fit the catch per effort series at the beginning and end of each year compared to the biomass at the beginning and end of the year. Parameters estimated were m, q and B_{1955} the biomass at the beginning of the time series and the differential equation was solved numerically. The results are summarized in the following equilibrium dB/dt graph. The MSY (the maximum on each graph increases) and Bmsy/B0 decreases. Medley alluded to this in acknowledging the limitations of that assessment.



Based on Medley and the sensitivity test explored here, we remain in support of the draft control rule and the draft management plan that was discussed in the body of this report.

2.3 ASSESSMENT OF POTENTIAL RISKS OF FISHING PRACTICES AND IDENTIFICATION OF BARRIERS TO IMPLEMENTING CHANGE

2.3.1 INTRODUCTION

The Grenada longline/troll fishery developed in the 1980's primarily targeting yellowfin tuna. The Grenadian government recognized the importance of participating in the management of highly migratory species in the Atlantic by formally becoming a member state of the International Commission for the Conservation of Atlantic Tunas (ICCAT) in 2018. Additionally, the longline/troll sector expressed an interest in attaining certification by the Marine Stewardship Council (MSC) as a sustainable fishery. To that end, a preliminary analysis was conducted in 2019 (MSC Pre-Assessment (Sieben and Gascoigne, 2021)) to identify strengths and deficiencies in achieving certification criteria. In response to that pre-assessment, a workplan was developed to address weaknesses in the fishery (Comprehensive Fisheries Improvement Project (C-FIP 2020)).

One goal of the C-FIP was to complete a "risk assessment of current tuna fishing practices to ensure target and other species within the marine ecosystem are protected and develop harvest control rules that reflect the risks." How those risks are evaluated and management implemented in the ICCAT arena are an important factor in this evaluation. Therefore, the scientific functions of ICCAT and the use of science in the development of management advice are discussed. Additionally, this report draws upon the analyses of the MSC Pre-Assessment year (Sieben and Gascoigne, 2021) and the C-FIP to evaluate progress based upon additional data, *if any*. Potential impacts of the practices of the Grenada fishery on the status of target and non-target/bycatch species and on habitat and ecosystem sustainability are examined. Also, control measures to mitigate impacts are suggested.

2.3.2 ICCAT AND GRENADA

Tuna and tuna-like species occur throughout the Atlantic Ocean and Mediterranean and Caribbean Seas in both temperate and tropical waters. They are exploited by fisheries flagged by coastal states of the Atlantic and its Seas and also by distant water fleets from outside the Atlantic. A Regional Fisheries Management Organization (RFMO) was developed in the 1970's to address the management of these resources, i.e. the International Commission for the Conservation of Atlantic Tunas (ICCAT). ICCAT is comprised of member countries who formally agree to promote the goals and objectives of the ICCAT treaty. Grenada has chosen to be a member state of ICCAT. The term CPC refers to Contracting Party and Cooperating Non-Contracting Party, Entity or Fishing Entity in ICCAT. Thus, Grenada is a Contracting Party.

ICCAT makes binding recommendations for management measures through member state agreements. With membership comes the responsibility to report catch and compliance data, as well as other information as stipulated in individual management measures. ICCAT also monitors compliance with extant regulations by both member and non-member states. The members of ICCAT can (and have) imposed sanctions on imports to member states of tuna exported from countries that are not in compliance.

The ICCAT Secretariat serves as the collator of ICCAT databases on catches, fishing effort and size frequency and other data. Through ICCAT's Standing Committee on Research and Statistics (SCRS), scientists from both member states and cooperating parties use these data to develop research to support stock assessments of the ICCAT species. Assessments provide the Commission with scientific advice on the status of the resources, overall recommendations on exploitation and the effectiveness of regulations.

Primary tuna and tuna-like species that are caught by Grenada fisheries are yellowfin tuna (YFT), bigeye tuna (BET), skipjack tuna (SKJ), albacore (ALB), blue marlin (BUM), white marlin (WHM), swordfish (SWO) and sailfish (SAI). Their status (SCRS 2024) and implications for Grenada fisheries are provided in Appendices

Appendix 1. Grenada Tuna Catches and Stock Status.

2.3.3 GRENADA TUNA PELAGIC LONGLINE, TROLL AND DROPLINE FISHERIES

Longline, troll and dropline fisheries are directed at large pelagic fishes in the Grenadian Exclusive Economic Zone (EEZ). The pelagic species comprise the dominant proportion of Grenadian total landings of ca 2000 tonnes (FAO FishStatj). Higher-grade fresh yellowfin and bigeye tunas are exported to the United States, while lower grade yellowfin tuna and other marketable species are sold into the domestic market. The main domestic market species of this fishery are yellowfin tuna, common dolphinfish (*Coryphaena hippurus*) and sailfish, while white marlin, blue marlin, swordfish and wahoo are rare/seasonal components of the retained marketable catch (Burns, 2019). Small catches of albacore, blackfin tuna and skipjack appear as Grenada landings in ICCAT databases (SCRS 2024). It is unclear the source and markets of these species. Additionally, Burns (2019) noted non-retained catches of several pelagic and coastal sharks and other teleosts from this fishery.

Currently (2024), the Grenada Fisheries Division reported approximately 385 registered longline vessels (10 vessels with length < 12 ft, 120 vessels 12-26 ft, 75 vessels 26-31 ft, 150 vessels 32-54 ft and 20 vessels 55-80 ft) employing 1700 full time fishers and 150 part time (Rennie pers comm 2024). Additionally, there were 265 vessels trolling/FAD vessels (500 fulltime and 95 part time fishers, Rennie pers comm 2024). Vessels using pelagic longline and troll gear target free-swimming schools of yellowfin tuna, and other tuna and tuna-like species and billfishes. This longline/troll fishery occurs on fishing grounds along the west coast of Grenada. Small-sized longline vessels make day trips using a ca 50 hooks per set. Vessels of about 9 m length make trips of between two and five days with approximately 200-300 hooks per set and larger vessels make trips of up to two weeks deploying between 400-1000 hooks per set (Sieben and Gascoigne, 2021). The fishery occurs year-round but the main yellowfin tuna season is from October to July. The longline vessels make shallow sets, with hooks fishing at depths between 10 and 55 m. Longline vessels primarily use J hooks but some larger vessels use circle hooks. Leaders (the fishing line adjacent to hooks) are made of nylon monofilament (Sieben and Gascoigne, 2021). Longline vessels use drift gillnets to catch flyingfish (*Hirundichthys affinis*) to be used as longline bait, purchase imported frozen bait (e.g. thread herring, *Opisthonema oglinum*) which they use as chum to catch flying fish to use as bait, or purchase pelagic forage fish, mainly bigeye scad (*Selar crumenophthalmus*) caught by a Grenada inshore beach seine fishery and kept alive in pens, for use as bait (Gentner et al., 2018). In recent years the use of scad as bait has predominated relative to flyingfish, as the availability of flyingfish has declined (Gentner 2024 *pers comm*).

The Grenada FAD fishery is conducted by vessels using troll and dropline gears aggregated around anchored fish aggregating devices (FADs). There are four FADs, anchored at approximately 10 nm, 12 nm, 20 nm and 25 nm along the east coast of Grenada, and a fifth off Carriacou (Sieben and Gascoigne 2021). The Grenville FAD Fishers Organisation (GFFO) maintains and manages the ownership of the anchored FADs (Sieben and Gascoigne 2019). The droplines are deployed from the smaller artisanal vessels around FADs at ca. 35 to 100 m depth using lures or live bait. Participants based mainly from Grenville, with a few participants based from Carriacou and Petit Martinique (Gentner et al., 2018; Sieben and Gascoigne, 2021). The FAD high season is between January and June, but operates throughout the year (Sieben and Gascoigne, 2021).

2.3.4 RISKS TO TARGET AND NON-TARGET SPECIES IN GRENADA LONGLINE, TROLL AND DROPLINE FISHERIES

The target species of these fisheries are defined as yellowfin tuna and bigeye tuna. This specification is based largely on the fact that these are the two species in the tuna export market. Catches of other tuna and tuna-like species occur and are sold in domestic markets and sometimes landings exceed those of bigeye. However, those species will be covered under the category of *Non-Target Species*. This analysis draws heavily on the C-FIP and the study conducted by Sieben and Gascoigne (2021), noting where the information base has changed and, most importantly, where it has not. So, for purposes of this analysis, yellowfin and bigeye are the target species. Skipjack, albacore, the marlins, sailfish and swordfish are non-target species termed “bycatch” locally because they are not targeted.

The primary information on tuna and tuna-like species catches used in this evaluation is the Task 1 ICCAT database. Task 1 data are the landings and discards reported by each CPC to ICCAT. Grenada’s reports are for landings only, as discards are not estimated. The most recent update of Task 1 data were provided in the report of SCRS in October of 2024. Grenada’s reported landings for recent years (Table 3) show the dominance of yellowfin tuna in the landings followed by sailfish, a non-target species. In many of these years, non-target landings of tuna species exceed that of bigeye, a target species. The decline overall of landings in the last three

years coincides with the impact of COVID; however, we suspect that some of the reports are incomplete, as well.

Year	2016	2017	2018	2019	2020	2021	2022	2023	%
Atlantic Yellowfin	1607	1257	1391	818	784	369	1036	730	77.5%
Atlantic Bigeye	23	33	27	19	11	0	1	4	1.1%
Western Atlantic Skipjack	17	17	18	30	10	13	12	11	1.2%
North Atlantic Albacore	50	62	37	23	22	6	3	0	2.0%
Atlantic Blue Marlin	53	54	62	69	49	31	30	37	3.7%
Atlantic White Marlin	15	9	11	19	14	1	5	7	0.8%
West Atlantic Sailfish	137	165	150	111	97	61	58	71	8.2%
North Atlantic Swordfish	29	36	36	22	15	4	7	6	1.5%
Blackfin tuna	0	0	0	94	73	0	36	40	2.4%
Atlantic bonito	2	2	1	0	1	1	0	0	0.1%
King mackerel	4	5	4	18	11	2	1	0	0.4%
Little tunny	1	0	0	0	0	0	0	0	0.0%
Atlantic Spanish mackerel	1	1	1	1	1	0	0	0	0.0%
Wahoo	0	0	0	32	18	15	16	16	0.9%
Total	1939	1641	1738	1256	1106	503	1205	922	100.0%

Table 3 - Grenada Landings of tuna and tuna-like species 2016-2023 in tonnes (SCRS 2024)

Sieben and Gascoigne (2021) in their Table 9 include the additional species of dolphinfish, great barracuda, rainbow runner and generic sharks. However, no updates on their landings post-2016 have been provided. Additionally, there are recorded Grenada landings of flyingfish and bigeye scad from the FAO database (FishStatj) which are discussed separately under bait species.

The current status of each of the target and non-target tuna and tuna-like species in the Grenada fishery have been updated from that given in Sieben and Gascoigne (2021). Assessments have been conducted for all of the tuna stocks subsequent to 2021 (SCRS 2024). Status updates are given in Appendix 1, as well as a discussion of management measures, progress in the development of harvest control rules (HCRs) at ICCAT and Grenada's participation in the fishery. ICCAT status determinations are defined as "overfished or not" and "overfishing or not" . A species-stock is overfished if its current biomass is less than that which would support maximum sustainable yield (MSY), i.e B/Bmsy < 1. A stock is undergoing overfishing if the current fishing mortality rate is greater than that which would eventually produce MSY, i.e. F/Fmsy > 1.

Additionally, a description of HCRs with examples from ICCAT and paths for Grenada's input into their development are provided in Appendix 2.

2.3.4.1 Bycatch Assessment of Relative Risks

The C-FIP Workplan requests in Activity 3 that there be "*a comprehensive ecological risk assessment of the open ocean longline/troll and troll/dropline FAD fisheries. (a) Assess relative risks to affected species, populations and stocks by comparing threat status categorizations, both within and between taxonomic groups in combination with assessing raised fishery-wide annual catch levels. (b) Determine the relative risks from the fishery on the viability of affected species, populations and stocks especially vulnerable to overexploitation, within and across taxonomic groups, by comparing indices for productivity and for susceptibility. (c) Identify contemporary fishing methods and gear, and opportunities for improved bycatch mitigation, accounting for potential cross-taxa conflicts or tradeoffs that might result from some bycatch mitigation approaches.*"

2.3.4.1.1 Non-Target Data Deficient Species

The bycatch species for which no stock assessments have been done (termed main secondary species using MSC parlance) were defined by Sieben and Gascoigne (2021) as dolphinfish, great barracuda, blackfin tuna, wahoo and Atlantic thread herring. As such they are data deficient. Therefore, they performed a productivity-susceptibility analysis (PSA) for these species. No new information on these species has become available since then so their results are given here (Table 4). The PSA scoring assigns a low risk to sustainability for each of the species, except a medium risk for the baitfish threadfin herring. Based on this information, it can be concluded that these species are ***highly likely to be above biologically-based limits.***

	Dolphinfish	Wahoo	Barracuda	Blackfin tuna	Threadfin Herring	Bigeye Scad
Average Age at Maturity	1	1	1	1	1	1
Ave Max Age	1	1	2	1	1	1
Fecundity	1	1	1	1	1	1
Ave Max Size	2	2	2	2	1	1
Ave Size at Maturity	2	2	2	2	1	1
Reproductive Strategy	1	1	1	1	1	1
Trophic Level	3	3	3	3	2	3
Ave Total Productivity	1.57	1.6	1.7	1.57	1.14	1.29
Availability	2	1	1	2	3	1
Encounterability	2	3	3	2	3	2
Selectivity	3	2	2	2	3	3
Post Capture Mortality	3	3	3	3	3	3
Total (multiplicative)	1.88	1.4	1.4	1.58	3.00	1.48
PSA Score	2.45	2.1	2.2	2.22	3.21	1.91
Risk Category	Low	Low	Low	Low	Med	Low

Table 4 - Risk based framework: productivity-susceptibility analysis for secondary species taken from Sieben and Gascoigne (2021) their Appendix 1. Entries are PSA scores described in their report

2.3.4.1.2 NON-TARGET SPECIES WITH STOCK ASSESSMENTS

Skipjack, albacore, the marlins, sailfish and swordfish all have had stock assessments conducted since 2021 (Appendix 1). Skipjack, albacore and swordfish are not overfished and are managed through Total Allowable Catch (TACs) and harvest control rules. Grenada catches are minimal relative to the TACs. Therefore, the Grenada fisheries impose ***a low risk of deleterious impacts on these stocks***.

The marlins and sailfish are overfished and stock-wide limitations on annual landings have been imposed by ICCAT without country-specific allocations. Grenada's reported landings are a significant proportion of the landings limits. Grenada's blue marlin landings are 3% of the landings limit of 1670 t which, itself, is less than the total landed catch. Grenada's white marlin landings are 3% of the 335 t landings limit. And the sailfish landings are 10% of the 1030 t limit (Appendix 1 and SCRS 2024). Given this, the Grenada fishery imposes ***a risk of impeding the recovery of these three stocks***

2.3.4.1.3 ENDANGERED, THREATENED AND PROTECTED SPECIES (ETPS)

While anecdotal evidence indicates that the Grenada longline/troll fishery rarely interacts with ETP species of sea turtles, seabirds and cetaceans, at present there is insufficient information to evaluate risk. The level of ETP interactions need to be verified including possible interactions with the use of gillnets for baitfish fishing.

2.3.4.1.4 BAITFISH SPECIES

The three baitfish species identified in the Grenada longline/troll fishery are flyingfish, bigeye scad and threadfin herring. No stock assessments have been conducted for bigeye scad and, thus, a PSA analysis was conducted,

concluding that there was a low risk to sustainability (see Table 2). Similarly, for threadfin herring there is a medium risk with the higher risk attributable to lack of information on the source of the threadfin herring. Recent information indicates that much of the threadfin herring bait purchased by fishers as imports from outside the Caribbean region.That source needs to be identified to verify that thredfin herring are being sustainably managed.

Flyingfish were traditionally the source of bait for the longline fishery with gillnets being used by the longline fishers to capture flyingfish. Additionally, there was an important targeted fishery for flyingfish that began to decline in the 2000's primarily centered in Barbados and Tobago. Hypothesized reasons for the decline include oceanographic shifts and interaction with increased sargassum. However, the development of the Grenada longline fishery undoubtedly contributed to an increase in flyingfish catches used as bait (but unreported). A flyingfish assessment was conducted in 2008 (Medley et al. 2008) which assessed the regional resource including landed catches and estimates of Grenada's baitfish usage at that time. Since that time regional reports of landings declined and bait usage was monitored. However, anecdotal information has indicated that bait usage has shifted from flyingfish to predominantly bigeye scad at the present time. The regional usage of baits in yellowfin fisheries was revisited (see Grenada Longline Bait Usage Assessment). Additionally, that report reexamined the flyingfish stock assessment in light of bait usage. That report used simple kg YFT per hook information to estimate bait usage as a first approximation. However, no information was available to divide it into the three bait species. Nevertheless, even if all the usage was flyingfish (which clearly it is not) then the assessment indicates ***the regional flyingfish resource is not overfished and not undergoing overfishing.*** An initial harvest control rule for flying fish was proposed by Medley et al. (2008) and was incorporated into a Caribbean regional flyingfish management plan (CRFM 2014). We support efforts to implement both the Plan and the HCR. Nevertheless, there is a need to monitor baitfish catches to improve accuracy and precision relative to the Grenada Longline Bait Usage Assessment and to divide the aggregate usage estimates into individual species.

2.3.4.1.5 HABITAT AND ECOSYSTEM

The longline/troll fishery occurs in pelagic waters. The FAD fishery includes a small number of FADs at fixed anchored locations. Thus, the risk of the fishery to the habitat is low. Ecosytem risks are largely unknown due to the lack of information on the baitfish fisheries in terms of the suite of species caught in baitfish gillnets and bigeye scad beach seines.

2.3.5 CONCLUSIONS AND RECOMMENDATIONS ON OPPORTUNITIES FOR IMPROVED BYCATCH MITIGATION

The analyses in this report addressed activities in the fisheries improvement plan for Grenada's longline troll fishery by updating the ICCAT stock assessments and the progress in the development of Harvest Control Rules for the ICCAT tuna species. Additionally, the likely risks to baitfish stocks were evaluated and are likely to be low (based on Bait Usage Report and PSA analysis).

The most important risks of the fishery lie with the marlin and sailfish stocks where the stocks are overfished and Grenada landings are a significant proportion of the landings limitation. Thus, far the main recommended mitigation is non-offset circle hooks. The extent of their use within the Grenada fishery needs to be quantified. Additionally, the release of marlins and sailfish alive should be considered, with the right handling techniques and the appropriate circumstances.

On the broader issues of management, a limiting factor remains the quantification of catches. A system for estimating discarded catches is imperative for fisheries improvement. While observers are problematic for small boats with day trips, larger vessels may be able to take observers periodically. A standard data collection protocol should be developed to take advantage of those opportunities should they arise.

Logbooks should be considered (ideally electronic) as a means of obtaining discard information. Additionally, personal logbooks from cooperating fishers can be extremely helpful in interpreting the fisheries data and designing monitoring programs. These would have to be accompanied with appropriate confidentiality agreements.

On the larger scale, the implications of harvest control rules and implementation of ICCAT recommendations on catch limits is that there will be controls on the fisher's catches, effort or both. Grenada needs to establish

the mechanisms to do that. This involves such things as: legislation providing the authority to do so; professionalizing the fishery through licensing and license limitations; and developing mechanisms to monitor the fishery within-year.

2.3.6 CHAPTER REFERENCES

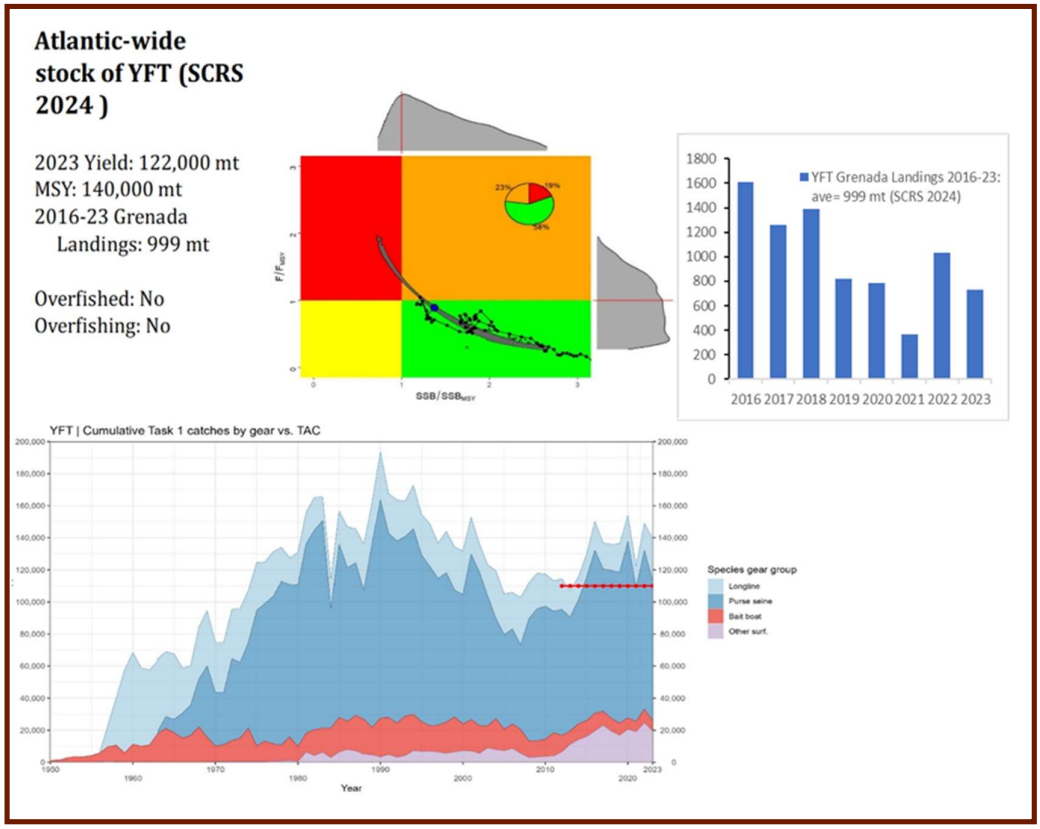
- Burns, A. 2019. A Comparison of Circle and J Hook Performance within the Grenadian Pelagic Longline Fishery. Master's thesis. Nova Southeastern University. Retrieved from NSUWorks, . (510) https://nsuworks.nova.edu/occ_stuetd/510.
- CRFM. 2014. Sub-regional Fisheries Management Plan for flyingfish in the eastern Caribbean. CRFM Special Publication No. 2. 42 p. + annexes.
- Gentner, B., Arocha, F., Anderson, C., Flett, K., Obregon, P. and van Anrooy, R. 2018. Fishery performance indicator studies for the commercial and recreational pelagic fleets of The Dominican Republic and Grenada. FAO Fisheries and Aquaculture Circular I–68. Rome. 79 pp. (www.fao.org/3/i8833en/I8833EN.pdf).
- Medley, P., K. Caesar, P. Hubert-Medar, K. Isaacs, J. Leslie, E, Mohammed, H. Oxenford, C. Parker, P. Phillip, A. Potts, R. Ryan, R. Walters, 2010. Part II: Management Summary and Stock Assessment Report for flyingfish in the eastern Caribbean. *In* FAO Western Central Atlantic Fishery Commission. Report of the Third Meeting of the WECAFC Ad Hoc Flyingfish Working Group of the Eastern Caribbean. Mount Irvine, Tobago, 21–25 July 2008. FAO Fisheries and Aquaculture Report. No. 929. Rome.
- SCRS. 2024. Report of the Standing Committee on Research and Statistics (Hybrid/Madrid 23-27 September), International Commission for the Conservation of Atlantic Tunas. October 2024, Madrid. REP_EN_22-23-II-2.pdf
- Sieben, C. and Gascoigne, J. 2021. Grenada pelagic longline, troll and dropline Atlantic Ocean yellowfin and bigeye fishery – Marine Stewardship Council pre-assessment report. FAO Fisheries and Aquaculture Technical Paper No. 673. Rome, FAO. https://doi.org/10.4060/cb5323en

2.3.7 APPENDICES

2.3.7.1 APPENDIX 1. GRENADA TUNA CATCHES AND STOCK STATUS

Primary tuna and tuna-like species that are caught by Grenada fisheries are yellowfin tuna (YFT), bigeye tuna (BET), skipjack tuna (SKJ), albacore (ALB), blue marlin (BUM), white marlin (WHM), swordfish (SWO) and sailfish (SAI). Other "small tunas" such as wahoo, blackfin tuna, king mackerel and Spanish mackerel are caught periodically. Catch data reported by member and non-member countries are collated into an ICCAT database. However, reporting of the small tuna species by both member and non-member countries is irregular. The following discusses each of primary species separately giving their status and implications to Grenada fisheries.

2.3.7.1.1 YELLOWFIN TUNA (YFT)

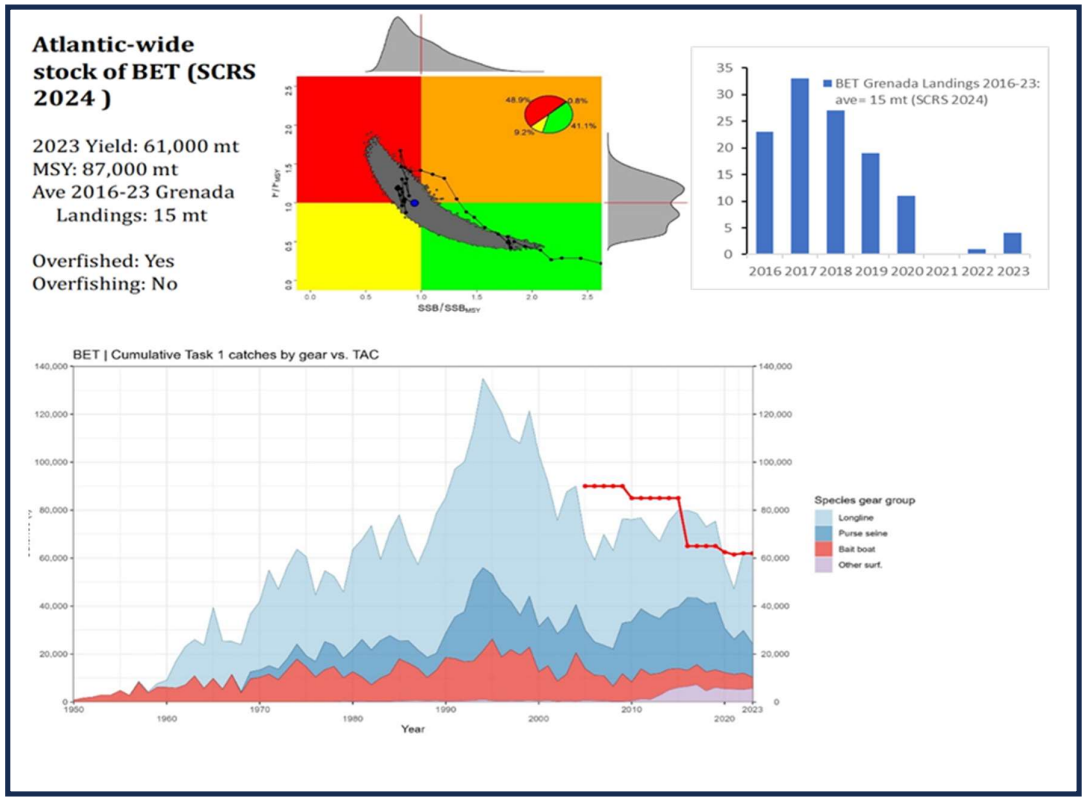


The preponderance of yellowfin catch occurs in the Eastern Atlantic, much of it in the Gulf of Guinea, predominately by purse seines, larger longliners (greater than 20 m length) and larger bait boats. In response to the status of the stock in the early 2000's, ICCAT established a TAC of 110,000 tons in 2012 but did not specify country-specific allocations. Thus, the TAC has been exceeded continuously by substantial amounts, indicating that existing conservation and management measures appear to be insufficient to limit harvest. The concern over the catches of small yellowfin and bigeye tunas at that time led to the establishment of temporal-spatial closures to surface fishing gear FAD sets in the Gulf of Guinea and subsequently in the entire Atlantic. Concerns have been reiterated that current catch levels, averaging nearly 140,000 mt over the last 5 years, are expected to result in overfishing and lead to an overfished status if they continue. Nevertheless, the current stock assessment (completed and approved by the SCRS in Oct 2024) indicates the Atlantic-wide stock of yellowfin is not as yet overfished (current spawning stock biomass is greater than the spawning stock biomass at maximum sustainable yield, i.e SSB/SSBmsy > 1) and is not undergoing overfishing (i.e. the current fishing mortality rate is less than the fishing mortality rate that would produce maximum sustainable yield, i.e. F/Fmsy < 1).

Yellowfin are the most important of Grenada's tuna catches, yet those catches are less than 1% of the Atlantic-wide catch. Additionally, Grenada fisheries are comprised primarily of small longliners (many less than 10 m in length) and trollers. The size of typical fish in the landed catch is in the 40-50 kg range, indicating there is not a concern in Grenada about "small fish" like that that drove the original ICCAT FAD regulations. Additionally, the Grenada FAD fishery uses a small number of anchored FADs, whereas the ICCAT FAD regulations were focused on the large-scale use of drifting FADs with radio beacons by purse seines. Thus, it appears that Grenada fisheries are not experiencing those management concerns. Grenada's catches will have little impact on yellowfin's overall status. However, collectively all the member states do impact the resource and Grenada should be prepared for future management actions designed to address those impacts and to meet the obligations that those regulations impose.

Presently there is no ICCAT HCR for Atlantic yellowfin tuna and the stated TAC (110,000 mt) is routinely exceeded. Thus far, the stock has remained in adequate conditions (no overfishing, not overfished), but the data and analyses from assessments indicate that there is little room for an increase in sustainable production of YFT. Hence, there is an expectation that a new TAC will need to be specified and country-specific allocations negotiated. Likely, those discussions among ICCAT members will focus on Eastern Atlantic issues of purse seines, FADs and large longliners. It is important that small island developing states (SIDS), such as Grenada, participate in those discussions such that the specific issues of small longline fisheries be recognized. In past ICCAT actions, agreements on small fishery allocations have been addressed by saying something like: *member states catching less than 1000 tonnes shall maintain (or reduce by "x" percent) catches of recent levels* (see for example (22-1. Recommendation by ICCAT replacing Recommendation 21-01 on a Multi-annual Conservation and Management Programme for tropical tunas. 2022-01-e.pdf). Grenada should be prepared for this circumstance by having a full knowledge of the variability of annual yellowfin catches and effort that have occurred in their fisheries.

2.3.7.1.2 BIGEYE TUNA (BET)

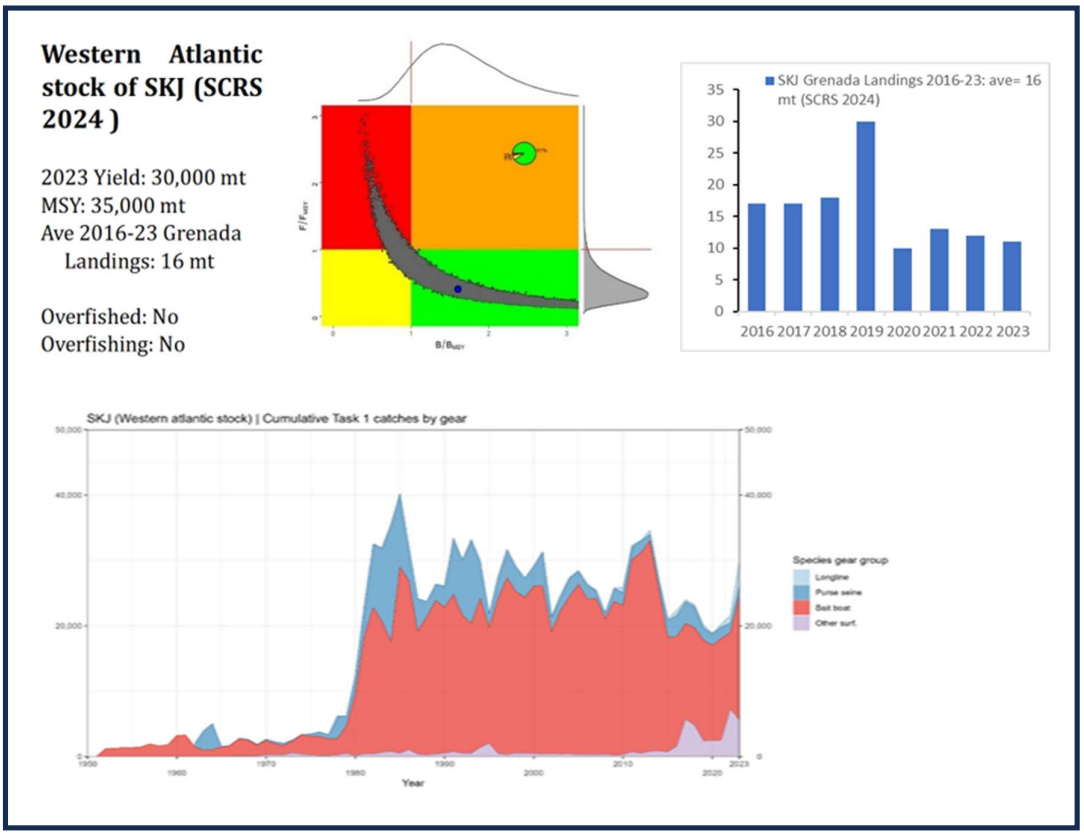


Based on the stock assessment of 2021, Atlantic bigeye tuna is overfished but not undergoing overfishing (probability of being overfished 58%, probability of overfishing 50%). Thus, in 2022 a TAC of 61,500 mt was imposed (2022-01-e.pdf). At that time, the SCRS (2024) advised that the Commission should consider adopting a TAC that would shift the stock status of BET towards a state of no overfishing and not overfished with a high probability. They also advised that "increased harvests on small fishes could have had negative consequences for the productivity of bigeye tuna fisheries (e.g., reduced yield at MSY and increased SSB required to produce MSY) (SCRS 2024). ICCAT Recommendation Rec. 22-01 (2022-01-e.pdf) also contains measures adopted by the Commission aimed at increasing long-term sustainable yield by reducing the catch of juveniles of tropical tunas. It is too early to know the extent by which these measures have reduced mortality of juvenile BET or if the stock has begun recovery.

The recent reports of Grenadian catches of BET (SCRS 2024) are very small relative to the Atlantic-wide catches and thus they fall into the category in Recommendation Rec. 22-01 (2022-01-e.pdf) that "(t)hose CPCs with recent average catch of less than 1,000 t are encouraged to maintain catch and effort at recent levels". However, there are requirements in the Recommendation for timely reporting of catches, FAD usage and other items by contracting parties.

No HCR has yet been developed for Atlantic BET but it is on the ICCAT/SCRS long term schedule. As that activity progresses it will undoubtedly have a focus on the multi-species nature of the Eastern Atlantic fishery of YFT/BET/SKJ and drifting FADS. Grenada should be prepared to engage in HCR development activities to assure that western Atlantic issues are appropriately considered.

2.3.7.1.3 SKIPJACK TUNA (SKJ)



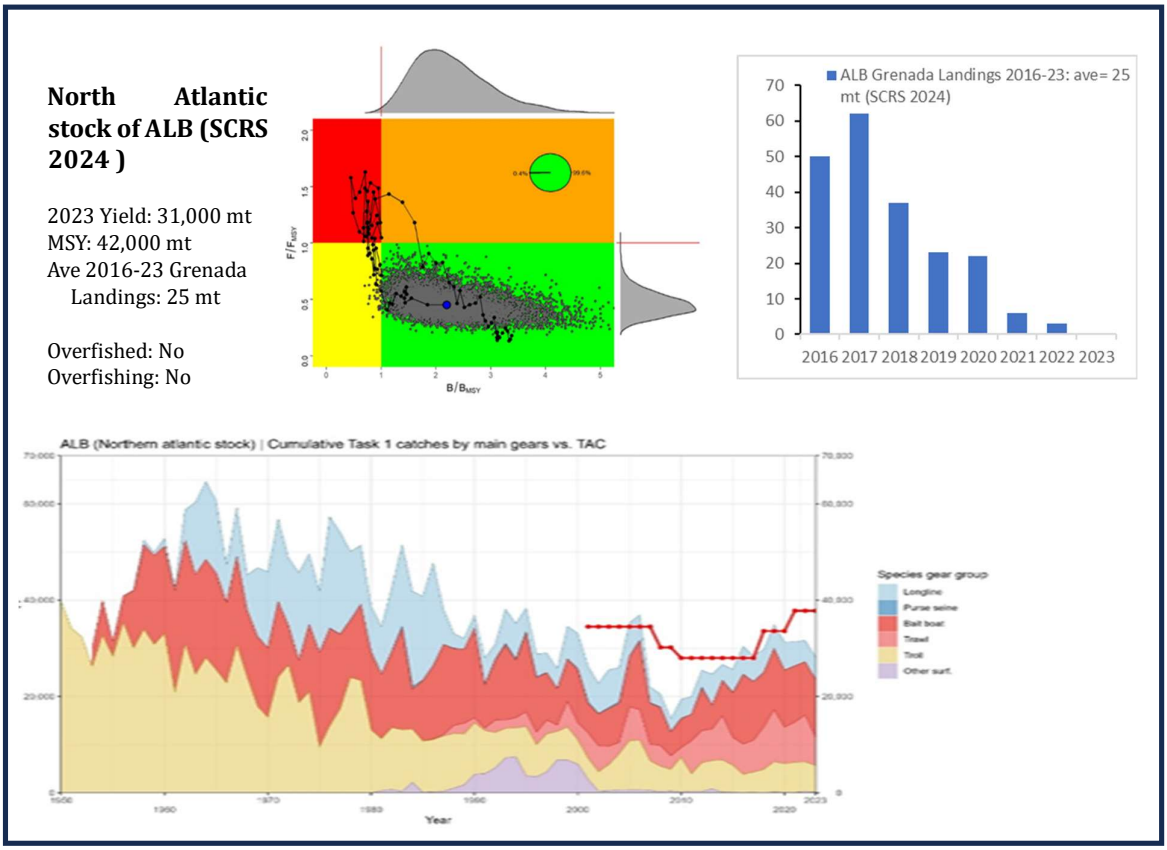
The 2022 stock assessment of western Atlantic skipjack concluded that was a high probability (91%) that the stock is not overfished nor undergoing overfishing and that a future constant catch using the median MSY of 35,277 t (the median estimate of MSY) will have about 70% probability of maintaining the stock in a not-overfished/not-overfishing condition.

An HCR has been in development by ICCAT and is nearing completion. Commission/SCRS development activity has been ongoing since 2022 through multiple science/management dialogs and ensuing analyses. There are currently 10 candidate management procedures(CMPs) as described in Response to the Commission, item 19.33 of SCRS report REP_EN_22-23-II-2.pdf), six empirical and four model-based. Briefly, these include: 1) Three index ratio CMPs with different limits on TAC change. TACs are set based on the combined index but when the change of index is within the specified envelope, TAC is not changed; 2) Three constant exploitation rate CMPs with three different limits on TAC change; and 3) Four model-based CMPs that use either a surplus production model or state-space surplus production model with a 100-40 hockey stick harvest control rule and an FTARGET of either 100%FMSY or 80%FMSY.

SCRS (2024) recommended that the Commission adopt one of the MSE-tested Management Procedures (MPs) (see Response to the Commission, item 19.33 of SCRS report REP_EN_22-23-II-2.pdf) and that a TAC be set based on that MP for 2025 and beyond.

Grenadian catches of SKJ are small averaging 16 t annually in recent years.

2.3.7.1.4 ALBACORE (ALB)

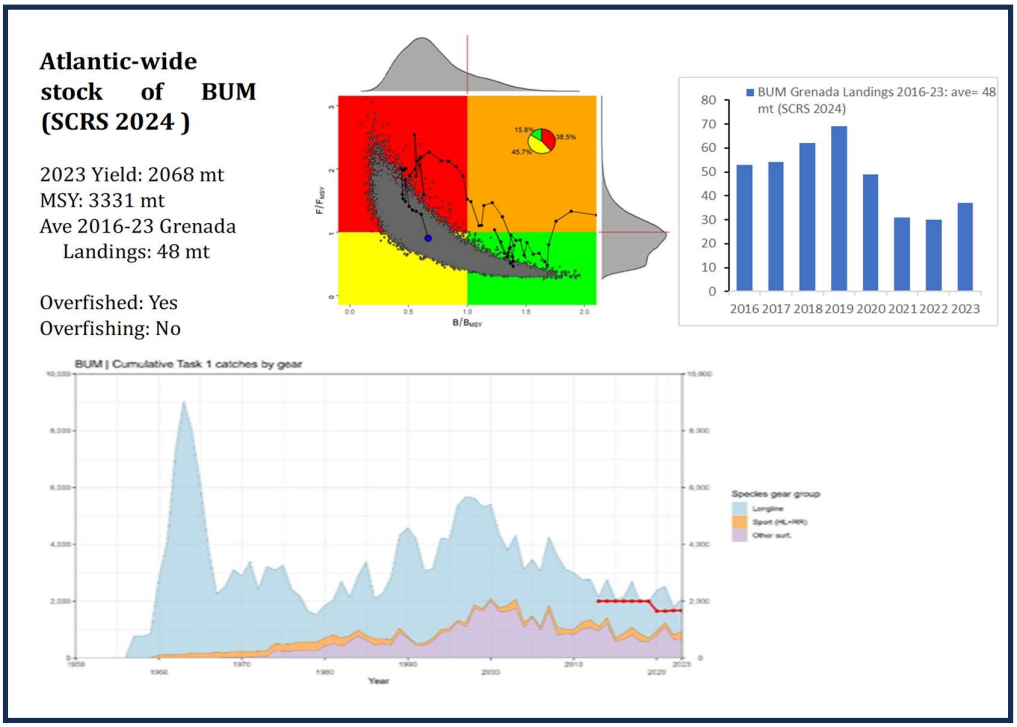


The 2023 stock assessment of North Atlantic albacore concluded that there was a high probability (>99%) that the stock is not overfished nor undergoing overfishing, noting that the abundance of North Atlantic albacore has continued to increase over the last two decades. A HCR was developed for NA ALB and fully implemented through Recommendation 21-04 (2021-04-e.pdf) that sets the management procedure to achieve Commission objectives. The SCRS applied that procedure yielding a recommended TAC of 47,251 t for 2024-2026.

Shares of the ALB TAC was allocated to CPCs through Recommendation 2023-05-e.pdf. That agreement notes that "CPCs other than those mentioned in paragraph 6 shall limit their annual catches to 302 t", where

paragraph 6 refers to the CPC specific allocations. Thus, Grenada falls into this category with recent catches averaging 25 t, the most recent years < 5 t.

2.3.7.1.5 BLUE MARLIN (BUM)



Blue Marlin were assessed in 2024 and the SCRS again concluded that the stock remains overfished but is not undergoing overfishing (61% probability that it is overfished and a 39% probability that it is undergoing overfishing). The SCRS (2024) emphasized that unaccounted uncertainties, mostly associated with the levels of landings and dead discards, continue to hamper the ability to provide sound management advice. Therefore, it was recommended that the Commission maintain or lower the current 1,670 t landings limit until the increasing biomass trend observed in the 2024 stock assessment is confirmed at the next BUM assessment. The SCRS once again recommended that instead of adopting landings limits, the Commission should adopt limits corresponding to true catch (i.e., landings + dead discards). The SCRS reiterated that it is of the utmost importance that CPCs report their total catch of BUM (i.e., landings and dead discards).

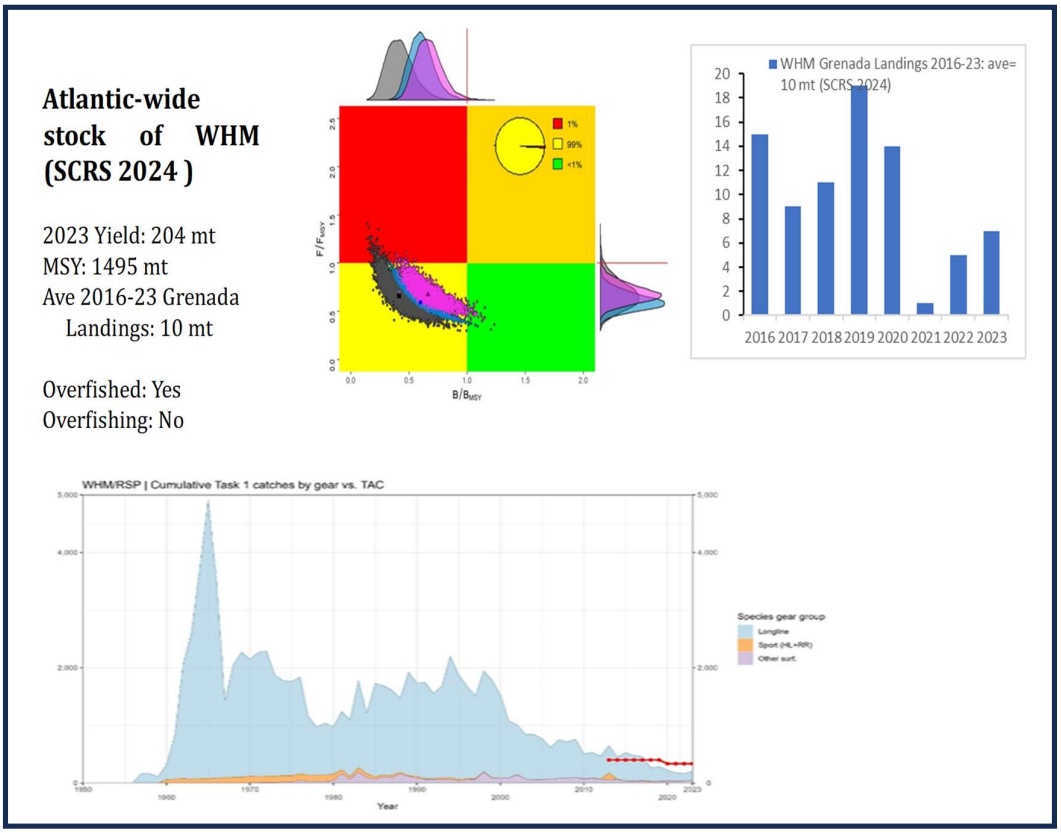
There has been a significant increase in the contribution from non-industrial fisheries to the total blue marlin harvest, and the landings from these fisheries are not fully accounted for in the current ICCAT database (SCRS 2024) which places serious limitations on the precision and accuracy of the current and future assessments. SCRS (2024) noted: "Recent research has demonstrated that in some longline fisheries, the use of non-offset circle hooks resulted in a reduction of billfish mortality, while the catch rates of several of the target species remained the same or were greater than the catch rates observed with the use of conventional J hooks or offset circle hooks. More countries have started reporting data on live releases since 2006. Additional information has come about, for some fleets, regarding the potential for modifying gears to reduce the bycatch and increase the survival of marlins. Such studies have also provided information on the rates of live releases for those fleets. However, there is not enough information on the proportion of fish being released alive for all fleets, to evaluate the effectiveness of the ICCAT recommendation relating to the live release of marlins." Grenada does not estimate and report discarded catch for BUM or other species. While catches of BUM are generally avoided in the longline fishery (Gentner 2018), it is likely that discarding does occur to some extent.

There is a domestic market for BUM in Grenada with recent average annual landings of 48 t (SCRS 2024), but the species is considered a non-target species in the longline troll fisheries, as BUM are not part of the export market. Grenada landings averaging 48 t annually is about 3% of the Atlantic-wide landed catch limit of 1670 t.

The use of circle hooks has been shown to reduce billfish mortality in the Caribbean. Additionally, the use of circle hooks are believed to contribute to a better quality of catch of target species, as caught fish are more likely to stay alive for longer on the line. In Grenada, a trial project was run on commercial longline vessels that primarily target tunas for export (Burns, 2019). Sieben and Gascoigne (2021) reported that fishers who participated in the trial continued using circle hooks full-time, while the other fishers were gradually gravitating towards them. That transition apparently has continued, but it has not been verified.

There is no HCR in place for BUM and it is unlikely ICCAT will initiate development of one in the next few years until better discard information becomes available.

2.3.7.1.6 WHITE MARLIN (WHM)



White Marlin were last assessed in 2019 and the SCRS again concluded that the stock remains overfished but not undergoing overfishing (99% probability that it is overfished and a 99% probability that it is undergoing overfishing). In response, a landings limit of 335 t was established. Although there is some evidence of slow rebuilding in recent years, the SCRS noted that catches have exceeded the landings limit in every year since its initial implementation and warns that if catches continue to exceed the landings limit, the rebuilding of the stock will proceed more slowly, or be put at risk of further declines.

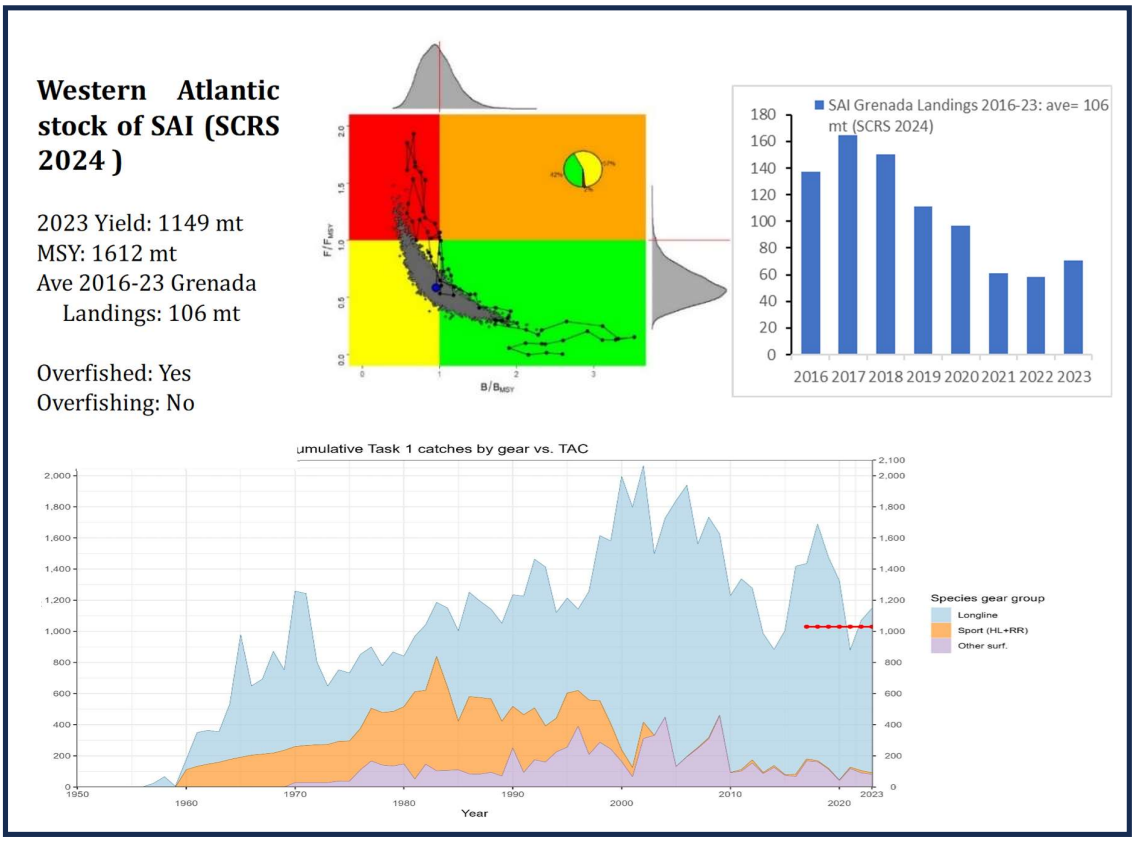
There has been a significant increase in the contribution from fishing by artisanal and small-scale fleets to the total white marlin harvest and these fisheries are not fully accounted for in the current ICCAT statistics (SCRS 2024). In addition, there is likely misidentification of spearfishes in the white marlin catches. This situation adds uncertainty to the stock assessment results.

Thus, the SCRS notes the great uncertainty in the assessment: *This is due to the inadequate reporting of discards, as well as the lack of reports from some artisanal and recreational fisheries that take marlin species. Measures should be taken to ensure that monitoring and reporting of all landings and discards, including live releases, are appropriate, accurate, and complete. This will likely require improvements to (or establishment of) observer programs of many CPCs, as well as the implementation of discard estimation methods using those data. Given the overfished status of the stock and the uncertainties in the data, including for both total removals and indices of abundance, it should be ensured that catches do not exceed current TAC until the stock has fully recovered. Given that experimental research has demonstrated that in longline fisheries the use of circle hooks resulted in a reduction of marlin catch rates and haulback mortality, and noting that they have different impacts on both target and bycatch species; then to reduce the chance of exceeding any established landings limit or TAC, the Commission should consider the use of non-offset circle hooks, the release of all marlins that are alive at haul back in ways that maximize their survival.*

Like BUM, landed WHM are sold in the domestic market and are non-target species in the longline fishery, generally avoided. However, the landed catch (SCRS 2024) represents about 3% of the Atlantic-wide landings limit.

There is no HCR in place for WHM and it is unlikely ICCAT will initiate development of one in the next few years until better discard information becomes available.

2.3.7.1.7 SAILFISH (SAI)



The most recent assessment of Western Atlantic Sailfish was conducted in 2023 at which time it was determined that the stock was overfished (59% probability of being overfished) and a 98% probability that it was not undergoing overfishing. The SCRS (2024) noted that in 2016 ICCAT adopted a decision rule: *if the total catch harvested in any year exceeds 1,030 t (based on 67% of MSY), the Commission shall review the Recommendation*

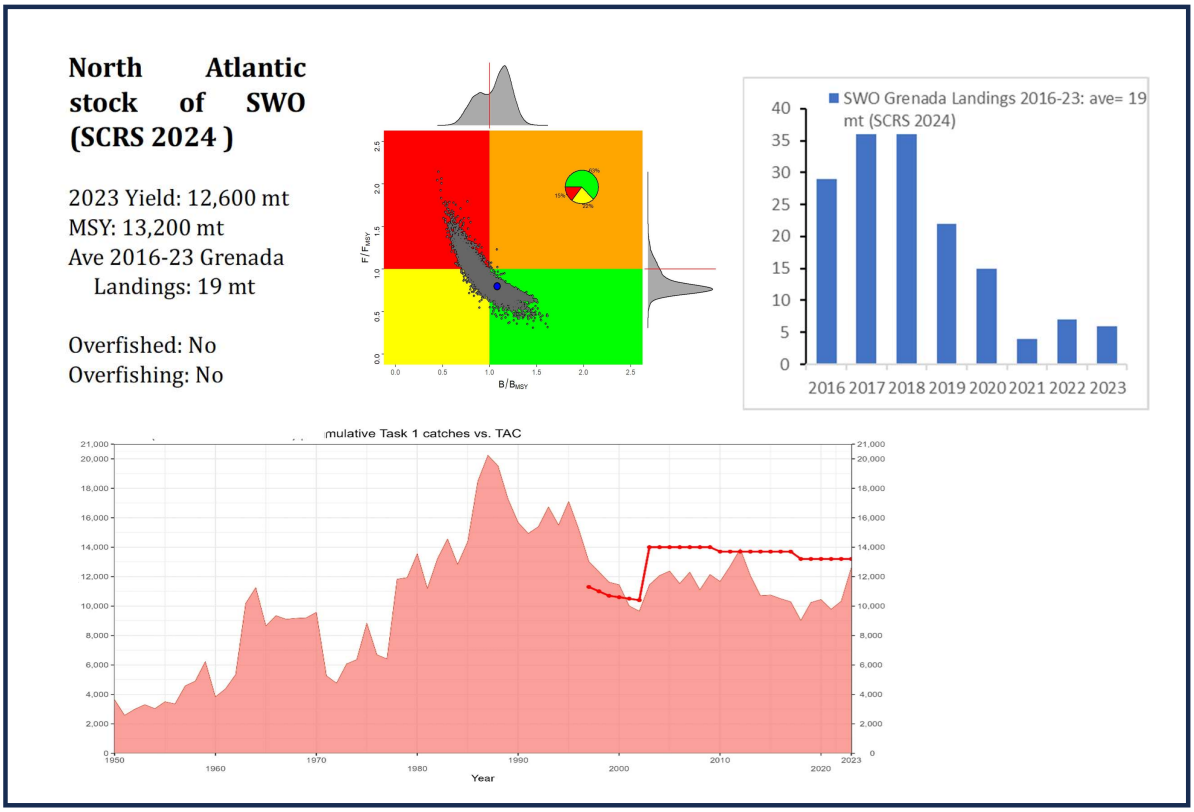
and effectiveness of this. However, the reported catch levels in 2018, 2019, 2020, 2022 and 2023 exceeded this level (catches in 2021 (880 t) did not). In line with other ICCAT conservation measures, some countries have established domestic regulations to limit the catch of sailfish. Among these regulations are: the requirement of releasing all billfish from longline vessels, minimum size restrictions, use of circle hooks and catch and release strategies in sport fisheries. Currently, four ICCAT Contracting Parties (Brazil, Canada, Mexico, and the United States) mandate or encourage the use of circle hooks on their pelagic longline fleets. Recent research has demonstrated that in some longline fisheries, the use of non-offset circle hooks resulted in a reduction of billfish mortality, while the catch rates of several of the target species remained the same or were greater than the catch rates observed with the use of conventional J hooks or offset circle hooks.

Important sources of uncertainty still remain in the stock assessment of Western Atlantic Sailfish. Available abundance indices demonstrate conflicting trends and reported catches, including dead discards, are significantly incomplete and unreported. While the reported catches in the past few years have been below the estimated MSY (1,612 t), the stock remains overfished. If ICCAT were to use the same decision rule as in 2016, the new catch limit at 67% of the current MSY would be 1,080 t. ICCAT has not adopted this as of yet.

An HCR for Western Atlantic Sailfish is not yet under development at ICCAT.

Grenada landings of sailfish averaged 106 t 2016-23 (SCRS 2024). It is considered a non-target species in the longline fishery. However, the landings of sailfish are only exceeded by yellowfin.

2.3.7.1.8 SWORDFISH (SWO)



North Atlantic Swordfish were last assessed in 2022 and the SCRS again concluded that the stock is not overfished nor undergoing overfishing (median B/Bmsy=1.08, median F/Fmsy=0.80). Additionally, catches have remained below both the TACs and the estimated MSY for the last two decades. Options for HCRs and management procedures were developed over the last two years and have now been completed. The SCRS (2024) recommends that the Commission adopt one of the tested management procedures (MPs) at the 2024 Commission meeting and that the TAC be set based on that MP for 2025 and beyond.

2.3.7.1.9 SMALL TUNAS

	Blackfin tuna (Thunnus atlanticus)	Atlantic bonito (Sarda sarda)	King mackerel (Scomberomorus cavalla)	Little tunny (Euthynnus alletteratus)	Atlantic Spanish mackerel (Scomberomorus maculatus)	Wahoo (Acanthocybium solandri)
2016	0	2	4	1	1	0
2017	0	2	5	0	1	0
2018	0	1	4	0	1	0
2019	94	0	18	0	1	32
2020	73	1	11	0	1	18
2021	0	1	2	0	0	15
2022	36	0	1	0	0	16
2023	40	0	0	0	0	16

Table 5 - Grenada small tuna landings in tonnes (SCRS 2024). Grenadian landings of all other small tunas (bullet tuna, Serra Spanish mackerel, cero, narrow and frigate tuna) were zero during this period.

No assessments of small tunas in the Caribbean region have been conducted, nor are there any harvest control rules. However, some assessments and management strategy evaluations have been done on selected species/stocks of small tunas outside the Caribbean region.

2.3.7.2 APPENDIX 2. ROLE OF HARVEST CONTROL RULES IN ICCAT AND GRENADA

An HCR is a pre-described rule that specifies management actions to be taken given the current status of the stock. For example, an HCR might specify: *if biomass falls below Bmsy, the fishing mortality rate should be reduced to 75% of Fmsy*. Then the TAC is set at the catch that will be expected when the reduced fishing mortality rate is imposed on the current biomass. Alternatives might be that the fishing mortality rate is reduced further in steps as the biomass surpasses lower and lower thresholds; or that the fishing mortality rate will be a proportion of Fmsy, where that proportion is defined by the ratio of current biomass to Bmsy. These example methods require that stock assessments have provided estimates of fishing mortality rates and biomass. These have been done for the major ICCAT species. If assessments have not been done, more empirical methods might be employed. An example might be one in which there is a time series of a survey data or catch rates available (call it an index of abundance). An objective of management is then defined as a period when the fishery was deemed to be performing "optimally". Then the index level during that period becomes the criteria to base an HCR. The HCR might be: *if the index for the last three consecutive years is less than "x" percent of the index during the "optimal" period, then reduce catches by "y" percent*. With either procedure, there should be analyses (Management Strategy Evaluations, MSEs) to consider the impacts of various uncertainties in data collection, biological understanding and to establish precautionary criteria to account for those uncertainties. ICCAT defines MSEs as "an inclusive, interactive and iterative process for evaluating, inter alia, the performance of proposed harvest control rules and reference points in relation to management objectives, including the risk associated with not achieving those objectives". A major ICCAT goal expressed in the 2015-2020 SCRS Science Strategic Plan was to use MSE to evaluate precautionary management reference points and determine robust harvest control rules.

The development of HCRs usually includes the definition and evaluation of multiple options. In the case of ICCAT, the selection of options is the responsibility of the ICCAT Commission. The SCRS role is to evaluate the quality of data sources, to develop decision rules and to define risks, i.e. the probability of outcomes and trade-offs between those outcomes. For example, a common trade-off considered in HCRs is the desire for larger annual TACs versus the desire for stability of annual catches (less year-to-year changes in TACs). In many cases those two goals are opposed (higher TACs lead to higher variability). It is the Commissioners' role to choose the

acceptable risk (probability) of outcomes and the tradeoffs between various goals. Thus, the development of HCRs requires a concerted dialog between managers, stakeholders and scientists.

HCRs are usually defined to establish stock-wide management responses such as TACs or limits on effort or days fished. As ICCAT HCRs are developed within Commission/SCRS dialog processes, it is expected that ICCAT HCRs will provide the overall management actions and allocation to member states will be negotiated. Once agreed, it is the responsibility of the member state to implement actions to maintain their fisheries within those allocations, to monitor the fisheries and to obtain the authority to do so. Implementation might be done through such actions such as area closures, seasons, TACs, live-release and others. However, development of HCRs for Atlantic tuna and tuna like species will be through the ICCAT/SCRS processes and schedules that have been established.

Currently, ICCAT/SCRS has developed HCRs and management procedures through extensive management strategy evaluations for several tuna stocks for which Grenada has Task 1 catches in the ICCAT database(SCRS 2024), These include North Atlantic albacore, North Atlantic swordfish and western Atlantic skipjack. The HCR and management procedure for NA ALB has been implemented (Recommendation 21-04 (2021-04-e.pdf) provides an excellent summary of how the HCR and management procedure was constructed). Options for HCRs and management procedures for NA SWO and WA SKJ have been fully developed and tested by the SCRS and awaits the Commission's final selection at the next ICCAT Commission meeting. The development of YFT/BET HCRs will be more complicated due to the multi-species and FAD nature of the eastern Atlantic fisheries. These await further work by the SCRS and Commission. Grenada's participation in those processes will be important by providing the perspective of small island developing states.