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Annex 2b - GRENADA

MINISTRY OF AGRICULTURE  
AND LANDS, FISHERIES  
& CO-OPERATIVES  
MINISTERIAL COMPLEX  
BOTANICAL GARDENS  
ST. GEORGE'S  
GRENADA, W.I.

22<sup>nd</sup> May 2023

Mr. Juan Carlos Vasquez  
Chief, Legal Unit  
CITES Secretariat - United Nations

Dear Mr. Vasquez,

**RE: STATUS OF GRENADA TOWARDS COMPLIANCE WITH CITES CONVENTION**

The Ministry of Agriculture and Lands, Fisheries and Cooperatives presents its compliments to you and through you to the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora and has the honour to inform the Secretariat of the positive efforts Grenada has been undertaking to be in compliance with the Convention, with respect to the resumption of sustainable and responsible trade in queen conch (*Strombus gigas*).

Against the above, and with the assistance of the United Nations Conference on Trade and Development (UNCTAD), the European Union (EU) and the Organisation of Eastern Caribbean States (OECS) Commission, Grenada was able to achieve the following thus far:

- Completion of a stock assessment study, the report of which is attached and provides definitive results on the robustness of the conch resources within Grenada's Exclusive Economic Zone (EEZ);
- Preparation of the first draft of the National Legislation (International Trade in Endangered Species of Wild Fauna and Flora Act, 2023), also attached for review and feedback. This would be followed by the hosting of a national validation consultation to present the revised draft and sensitize key stakeholders and the general public, prior to submission to the Cabinet for final approval.
- Appointment of Grenada's Management and Scientific Authority that was previously submitted to the Secretariat.
- Measures are currently being considered to implement a co-management arrangement through the strengthening of cooperation with fisherfolks to provide for the responsible management and sustainable utilization of this fishery.


In this regard, the Ministry wishes to be advised of any further actions to be taken and looks forward to our continued collaboration to ensure that Grenada can resume international trade in queen conch in a responsible and sustainable manner.

.../2 The Ministry

The Ministry of Agriculture and Lands, Fisheries and Cooperatives, avails itself of this opportunity to renew to the CITES Secretariat the assurances of its highest consideration.

Sincerely,

**Permanent Secretary  
Ministry of Agriculture  
and Lands**

  
*Aaron Francois (Mr.)*

**PERMANENT SECRETARY**

Ministry of Agriculture and Lands,  
Fisheries and Cooperatives

Cc: Keren Gaynor, Scientific Support Officer, CITES, [karen.gaynor@cites.org](mailto:karen.gaynor@cites.org)



**“Seizing the trade and business potential of Blue BioTrade products for promoting sustainable livelihoods and conservation of marine diversity in selected Organization of Eastern Caribbean States (OECS) countries Project” (UNCTAD-OECS Blue BioTrade project)**

**GRENADA  
Queen Conch Stock Assessment Report  
30 January 2023**

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### **3. Acknowledgements**

This report has been prepared in the context of the project entitled “Seizing the trade and business potential of Blue BioTrade products for promoting sustainable livelihoods and conservation of marine biodiversity in selected Organization of Eastern Caribbean States (OECS) Countries” (Blue BioTrade Project). The project is funded by the OECS and the European Union under the Regional Integration Through Growth Harmonization and Technology (RIGHT) project and implemented by the United Nations Conference on Trade and Development (UNCTAD), the OECS and the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

This report was produced by Mauro Gongora (consultant and queen conch assessment expert) of the Blue BioTrade Project, under the guidance of and with substantive inputs from David Vivas Eugui, Legal Officer, Claudia Contreras, Economic Affairs Officer, and Maria Durleva, project management expert, all at the Trade, Environment, Climate Change and Sustainable Development Branch at UNCTAD; and from Karen Gaynor, Scientific Support Officer at the CITES Secretariat. The publication has also benefited from comments and inputs from Lench Fevrier and Natasha Deterville-Moise from the OECS Secretariat. The author would like to thank Mr. Justin Rennie, Chief Fisheries Officer in the Grenada Fisheries Division for the valuable information and support provided. The author would also like to thank Lisa Chetram, Fisheries Officer in the Grenada Fisheries Division for her support in conducting this study.

### **4. Explanatory notes**

References to “dollars” and “\$” indicate United States dollars, unless otherwise stated.

Use of a dash (–) between dates representing years, e.g., 2015–2018, signifies the full period involved, including the initial and final years.

Reference to metres is represented by “m” and feet by “ft”.

Reference to kilograms is represented by “kg” and pounds by “lbs”.

Reference to nautical miles is represented by “NM”.

To reflect the closest estimate for data, decimals and percentages are rounded off.

Numbers in money are rounded to the nearest dollar, unless otherwise stated.

Decimals and percentages in this publication do not necessarily add to totals because of rounding.

### **5. Acronyms and abbreviations**

CFMC- Caribbean Fisheries Management Council

CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora

CRFM - Caribbean Regional Fisheries Mechanism

FAO - Food and Agriculture Organization of the United Nations

GDP - Gross domestic product

IUU - Illegal, unreported and unregulated (fishing)

NDF - Non-detriment finding

NOAA - National Oceanic and Atmospheric Administration of the United States government

OECS - Organization of Eastern Caribbean States

OSPESCA - Organización del Sector Pesquero y Acuícola del Istmo Centroamericano

RQCFMCP - Regional Queen Conch Fishery Management and Conservation Plan

RST - Review of Significant Trade

SD - Standard deviation

VAR - Variance

UNCTAD - United Nations Conference on Trade and Development

WECAFC - Western Central Atlantic Fishery Commission

## Executive Summary

The queen conch is a CITES Appendix II-listed species, and its trade is subject to regulations compatible with legal, traceable, and sustainable use. Grenada is currently subject to two recommendations to suspend trade under CITES. The first one is from 2016 and is due to the non- submission of annual reports to CITES for three consecutive years (i.e., since 2013). This suspension affects trade in all CITES-listed species including queen conch. The second suspension has been in place since 2006 and is linked to a CITES Review of Significant Trade (RST) for the queen conch. . In May 2022, Grenada had provisionally avoided a third suspension under the CITES National Legislation Project through the technical assistance provided by the Blue BioTrade project partners.

In response to the immediate and long-term need to enable legal, sustainable and traceable trade of queen conch through the implementation of Blue BioTrade concept in Grenada, the Fisheries Division of the Government of Grenada, the United Nations Conference on Trade and Development (UNCTAD) and the Organization of Eastern Caribbean States (OECS)—with the financial support of the European Union, jointly organised a queen conch stock assessment training workshop held at the Grenada Fisheries Division in St. George’s, Grenada from 17-18 October 2022. The objective of the workshop was to train eight staff members of the Grenada Fisheries Division and five fishers on how to assess the queen conch population including the estimation of density, abundance and biomass availability in two selected primary fishing grounds around Carriacou and Calliste. The training also included (i) underwater queen conch field survey methodology (ii) how to process, analyse and interpret the results, as well as (iii) setting of a seasonal Total Allowable Catch (TAC) limit, all of which is envisaged to inform the setting of a catch quota. Complementarily, a closed fishing season period to protect the stock and support breeding during spawning season was recommended.

In addition, a 4-day field data collection exercise was carried out from 19 -22 October 2022 with the purpose of conducting a UNCTAD-OECS Blue BioTrade project queen conch stock assessment. Two fisheries officers and five fishers participated in the field exercise. A stratified random sampling methodology was employed in the field data collected to determine the structure of the queen conch population, lip thickness, density and abundance in two selected primary fishing grounds (Carriacou and Calliste).

A total of 250 queen conch were found and measured in a total area of 1,100 m<sup>2</sup> (using underwater belt transects each measuring 50 x 2 m) in two primary fishing grounds (Calliste and Carriacou). A density of 249 conchs and 670 conchs per hectare were found in Calliste and Carriacou, respectively. In both study areas, primarily very mature adult conchs were found. Very few juvenile and sub-adult conchs were found.

In the Calliste area, the area of distribution of queen conch was estimated at 1,748 hectares while in Carriacou the area was estimated at 3,843 hectares. Queen conch abundance in Calliste is estimated 435,252 individuals, while in Carriacou the abundance was estimated at 2,578,160 individuals giving an estimated biomass (assuming a minimum weight of 8 ounces of meat weight for each animal processed at 85%) available to the fishery of 217,626 lbs and 1,289,080 lbs, respectively. The mean shell length in Calliste was estimated at 21.7 cm and mean shell lip thickness was 16.7 mm. Animals measuring 21 to 25 cm in shell length composed 87.63% of the population. The mean shell length in Carriacou was estimated at 21.5 cm and mean shell lip thickness was 15 mm. Animals measuring 20 to 25 cm in shell length composed 85.6% of the population.

**The main conclusion of the study is that the queen conch population of Grenada is considered healthy.** The bulk of the population (85%) is composed of animals measuring 20 to 25 cm in shell length and 15 mm in shell lip thickness. In both study areas, the shell length and lip thickness are very similar suggesting that it is a single population. In Calliste the queen conch shell is older than in Carriacou which makes it easier to bore a small hole near the third spire of the shell using a scaling hammer (chipping hammer). A dinner knife is then used to cut the adductor muscle, which allows the removal of the animal from the shell for processing. In both study areas, the queen conch are very mature adult individuals that are referred to as “mega spawners” and overfishing of these very mature individuals can result in the rapid decline of the health and reproductive capacity of the population. For this reason, extreme caution should be exercised in the harvesting of mega spawners. The current fishing effort being applied to the fishery is not considered high (considering fishers’ knowledge and experience of the fishery) and should be maintained as low as possible. The queen conch meat did not show any distinguishing characteristics that would indicate an inferior meat quality.

**The rate of harvest or exploitation of queen conch in Grenada will ultimately be determined by the Grenada Fisheries Division. However, it is noted that the exploitation rate should allow for the natural regeneration of the population and therefore, this study recommends a precautionary seasonal TAC limit of 376,676 lbs of conch meat, which represents 25% of the total estimated biomass of 1,506,706 lbs. It is important to note that queen conchs were sampled in only two fishing areas and there are additional fishing areas where sampling and biomass estimation was not done. Sustained catch landings data collection and field monitoring of the queen conch population in Grenada at least every two (2) years is strongly recommended to gather information on spatial and temporal changes in the population parameters for improved management and conservation of queen conch. The TAC should be reviewed and amended based on the results of the population monitoring. Finally, a closed season (already being supported by fishers contingent upon a similar measure in nearby fishing areas/jurisdictions) extending to at least three months during the queen conch peak spawning period (for e.g., July – September) is also strongly recommended.**

## 6. Introduction

The queen conch (*Strombus gigas*) is the second most important fishery commodity after Spiny lobster (*Panulirus argus*) in the Caribbean region. Queen conch fisheries have been developed at various levels by the Bahamas, Jamaica, Belize and other countries in the region. Queen conch meat production during the period of 1997–2017 reached its highest level of 38,809 tons in 1997 for the Western Central Atlantic Fishery Commission (WECAFC) area and peak production for the Caribbean region was 10,746 t in 2016.<sup>1</sup>

Queen conch has been under CITES regulation since 1992 when concerns over the species’ overexploitation due to increased demand led the CITES Parties to list the queen conch under CITES Appendix II, meaning that international trade was allowed under a permit system provided that it could be demonstrated that it was at sustainable levels. In 1995, the CITES Animals Committee included the queen conch in the Review of Significant Trade (RST) process following concerns about the continuing growth of the industry, and problems with enforcement in several range States. Queen conch exports from Antigua and Barbuda, Barbados, Dominica, Saint Lucia and Trinidad and Tobago were temporarily

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<sup>1</sup> Prada, M. C.; Appeldoorn, R. S.; Van Eijs, S. & Pérez, M. M. 2017. Regional Queen Conch Fisheries Management and Conservation Plan. FAO Fisheries and Aquaculture Technical Paper No. 610. Rome, FAO. 70 pp



suspended in the CITES Significant Trade Review of 1995.<sup>2</sup> Grenada became a party to CITES on 30 August 1999 and the Agreement entered into force on 20 November the same year.<sup>3</sup>

Queen conch was selected a second time for review under the RST in 2003,<sup>4</sup> following which a recommendation to suspend trade in queen conch was issued by the CITES Standing Committee for Grenada, Honduras, the Dominican Republic and Haiti. In response to this measure, Honduras and the Dominican Republic conducted studies designed to demonstrate the sustainability of their fisheries and were subsequently removed from the review. Honduras is currently allowed to export a catch quota as agreed with CITES. Grenada and Haiti remain subject to a trade suspension recommendation under RST since 2006. This trade suspension will remain in place until Grenada implements the recommendations of the CITES Animals Committee concerning queen conch. In addition to the RST trade suspension, Grenada has also failed to submit CITES annual reports from 2013 to date and until Grenada submits the missing annual reports, a trade suspension for all CITES-listed species will remain in place.

Due to the importance of the queen conch trade and its management challenges in some countries where the species is commercially harvested, a first meeting of the Western Central Atlantic Fishery Commission / Caribbean Fishery Management Council / Organizacion del Sector Pesquero de Centro America / Caribbean Regional Fishery Mechanism (WECAFC/CFMC/OSPESCA/CRFM) Working Group was held in Panama in October 2012.<sup>5</sup> During this meeting, participating countries agreed to ensure the sustainable exploitation of the queen conch by conducting assessments of the status of stock, calculation of conversion factors and estimation of annual catch quotas using analytical models that consider the population dynamics of this resource.

In 2014, a second meeting of the WECAFC/CFMC/OSPESCA/CRFM Queen Conch Working Group was held in Panama City, Panama<sup>6</sup>.

In 2017, a Regional Queen Conch Fishery Management and Conservation Plan<sup>7</sup> was developed and published, following the recommendations of the first meeting of the WECAFC/CFMC/OSPESCA/CRFM Working Group.

The third meeting of the CFMC/OSPESCA/WECAFC/CRFM/CITES Working Group on Queen Conch (QC)<sup>8</sup> that was held in Panama City in November 2018 and participating countries were recommended to implement the Regional Queen Conch Management and Conservation Plan. The Working Group included

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<sup>2</sup> Review of Significant Trade in Queen Conch (*Strombus gigas*) 1995 (Phase III) | CITES.

<sup>3</sup> See <https://cites.org/eng/parties/country-profiles/gd>.

<sup>4</sup> For the full text, see [https://cites.org/sites/default/files/eng/prog/queen\\_conch/docs/2003%20-%20CITES-TRAFFIC%20Report%20on%20Review%20of%20Significant%20Trade%20%28AC19%20Doc.%208.3.%20Annex%29.pdf](https://cites.org/sites/default/files/eng/prog/queen_conch/docs/2003%20-%20CITES-TRAFFIC%20Report%20on%20Review%20of%20Significant%20Trade%20%28AC19%20Doc.%208.3.%20Annex%29.pdf).

<sup>5</sup> [Report of the first meeting of the OSPESCA/WECAFC/CRFM/CFMC Working Group on Caribbean Spiny Lobster, Panama City, Panama, 21–23 October 2014. Informe de la primera reunión del Grupo de Trabajo de OSPESCA/COPACO/CRFM/CFMC sobre la Langosta Espinosa del Caribe, Ciudad de Panamá, Panamá, 21-23 de octubre de 2014. \(fao.org\).](#)

<sup>6</sup> [Report of the second meeting of the CFMC/OSPESCA/WECAFC/CRFM Working Group on Queen Conch, \(fao.org\).](#)

<sup>7</sup> For more information see [Regional Queen Conch Fisheries Management and Conservation Plan \(clmeplus.org\).](#)

<sup>8</sup> [Report of the Third meeting of the CFMC/OSPESCA/WECAFC/CRFM/CITES Working Group on Queen Conch, Panama City, Panama, 30 October – 1 November 2018 / Informe de la tercera reunión del grupo de trabajo de OSPESCA/COPACO/CRFM/CFMC sobre el caracol rosado, Ciudad de Panamá, Panamá, 30 de Octubre – 1 Noviembre de 2018 \(fao.org\).](#)

a scientific, statistical, and technical advisory sub-group (SSTAG) that met in Miami in April 2019<sup>9</sup> and recommended that countries need to identify long-term queen research strategies for conducting density surveys.

Grenada has not participated in any of the CITES Conference of Parties since 1995 when it became a Party. Also is has not participated in the meetings of the Western Central Atlantic Fishery Commission / Caribbean Fishery Management Council / Organizacion del Sector Pesquero de Centro America / Caribbean Regional Fishery Mechanism (WECAFC/CFMC/OSPESCA/CRFM/CITES) queen conch working group.

Grenada, a small country of only 344 km<sup>2</sup>, is in the Southern Caribbean, between St. Vincent and the Grenadines (North) and Trinidad and Tobago (South). Grenada has a total shelf area of 900 km<sup>2</sup>, within which there are large areas of sand and coral rubble that support conch populations. The conch fishery is important to Grenada as conch meat is used extensively by local people and as a delicacy in the tourist industry, as well as an export product. Most fishermen harvest conch using scuba (self-contained underwater breathing apparatus) and free diving from small wooden boats with outboard engines. Only queen conch meat is landed at the many landing sites throughout the island.

In a Review of Significant Trade (4<sup>th</sup> Phase) in specimens of queen conch that was presented at the 19th meeting of the Animals Committee in 2003<sup>10</sup>, the Animals Committee proposed that the Standing Committee recommend a suspension of imports of specimens of the species from those Parties in Category (i) and Category (ii) if the Secretariat, in consultation with the Chairman of the Animals Committee, has not been able to verify that they have implemented certain recommendations,

On this occasion, Grenada was included in Category (ii) of RST in which the queen conch was classified as being ‘species of possible concern’ in that country and for which it is not clear whether or not the provisions of Article IV, paragraph 2(a), 3 or 6(a) of the Convention were being implemented.<sup>11</sup>

The recommendations made to Grenada were as follows:

Within 12 months:

- a) Establish cautious catch and export quotas, communicate these to the Secretariat and provide information for the basis of these quotas.
- b) Establish a standardized minimum meat weight that corresponds to adult specimens of unprocessed and processed meat.
- c) Design and implement a fishery data collection programme. This programme is designed to collect catch and effort data and shall include 1.) a system of permits and licenses for commercial harvesters and exporters, and 2.) regular reporting of landing and export data.

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<sup>9</sup> Draft Report of the Scientific, Statistical and Technical Advisory Group of the CFMC/OSPESCA/WECAFC/CRFM/CITES Queen Conch Working Group (QCWG). Miami, United States of America, 15-18 July 2019. Available at <https://www.fao.org/fi/static-media/MeetingDocuments/WECAFC/WECAFC2019/17/12e.pdf>

<sup>10</sup> For the full text see <https://cites.org/sites/default/files/common/com/ac/22/EFS-AC22-Inf04.pdf>.

<sup>11</sup> Notification to the Parties No. 2016/02, For the full text see <https://cites.org/sites/default/files/notif/E-Notif-2016-022.pdf>.

- d) Design and implement a long-term population monitoring programme for the designated commercial fishing areas. This programme should provide reliable estimates of adult and juveniles densities within commercial fishing areas, at a minimum.

Within 24 months:

- a) Apply adaptive management procedures to ensure that further decisions about harvesting and management of the species will be based on the monitoring of the impact of previous harvesting and other factors;
- b) Consider and implement the recommendations of the International Queen Conch Initiative - CITES workshop (Montego Bay, Jamaica 11-12 June 2003), particularly the recommendations concerning:
  - i) Development of a regional management regime, including cooperative quota setting;
  - ii) Law enforcement capacity and effectiveness;
  - iii) Population assessments and other research relating to the management of the queen conch.

Grenada is further subject to a suspension in trade of all CITES-listed specimens, including queen conch, based on the lack of annual report submissions in connection with Article VIII of the Convention. Grenada is required to submit to CITES annual reports containing a summary of the information specified in subparagraph (b) of paragraph 6 of this Article.<sup>12</sup> For the suspension to be withdrawn, Grenada would need to submit annual reports dating back to at least 2013.<sup>13</sup>

In 2020-2021, UNCTAD and the OECS in cooperation with CITES implemented the project, “Seizing the trade and business potential of Blue BioTrade products for promoting sustainable livelihoods and conservation of marine diversity in selected Organisation of Eastern Caribbean States (OECS) countries” (“UNCTAD-OECS Blue BioTrade project”).<sup>14</sup> The project aimed at empowering small-scale coastal producers to produce and trade queen conch products sustainably through the application of Blue BioTrade Principles and Criteria in Grenada, Saint Lucia and Saint Vincent and the Grenadines. Phase 1 of the project considers three key, subsequent and complementary activities: (i) the elaboration of queen conch product assessments in Grenada, Saint Lucia and Saint Vincent and the Grenadines; (ii): the elaboration of a Regional Blue BioTrade Action Plan based on findings of the country studies and, (iii) the elaboration and delivery of technical assistance activities on selected areas. Activities 1 and 2 have been completed whilst the third is now underway. Phase two of the project is being developed and is being implemented through a partnership between the OECS and the Caribbean Biodiversity Fund.

Against this background, an assessment of the queen conch population of Grenada was carried out in 2022. The objectives of the queen conch stock assessment included the determination of the structure of the population, lip thickness, sex composition, density, and abundance in two selected primary fishing grounds around Carriacou and Calliste.

Prior to the field data collection exercise, a 2-day workshop was held on October 17-18, 2022, to train staff members of the Grenada Fisheries Division on how to conduct a queen conch stock assessment.<sup>15</sup>

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<sup>12</sup> Notification to the Parties No. 2016/022 (cites.org)

<sup>13</sup> For the full text, see <https://cites.org/sites/default/files/notif/E-Notif-2016-022.pdf>.

<sup>14</sup> For more information, see <https://unctad.org/project/blue-biotrade-promoting-sustainable-livelihoods-and-conservation-marine-biodiversity>.

<sup>15</sup> [Grenada Queen Conch Stock Assessment Workshop | UNCTAD, 2022](#).

Figure 1 shows some of the participants of the 2-day workshop. Eight staff members of the Fisheries Division, two fishers from Calliste and three fishers from Carriacou (participated virtually) received training on underwater field surveys for queen conch and on how to process, analyze and interpret the results of the collected field data.

Figure 1. Queen conch stock assessment workshop participants



Source: Gongora, M. (2022).

After the 2-day workshop, queen conch field data collection was carried out in Calliste from 19-20 October 2022 and in Carriacou from 21-22 October 2022. Figure 2 shows field data collectors taking queen conch morphometric measurements in the field.

Figure 2. Field data collectors taking queen conch morphometric measurements.



Source: Gongora, M. (2022)

The queen conch population assessment is envisaged to support the estimation of Total Allowable Catch (TAC) limit, which will inform the establishment of an export quota of queen conch meat for the two study sites only. It is noted that the fisher participants who attended the queen conch stock assessment

training workshop indicated that they were in support of the establishment of a closed fishing season to protect the queen conch peak spawning season (possibly between July – September of each year) subject to similar measures being implemented in nearby fishing grounds/jurisdictions.

This project will help Grenada to conduct a scientific assessment of the queen conch stock in two principal fishing grounds. The outputs of this project and the subsequent queen conch fisheries-dependent and independent data collection, monitoring and periodic field research and reporting of findings could also help Grenada to make a case to the CITES Secretariat, Animals Committee and Standing Committee to review the progress made by Grenada with the objective to lift the current trade suspension under RST and to ensure that Grenada's queen conch fishery is sustainable into the future. Grenada can further benefit from export earnings from queen conch meat once the country is allowed to trade this important fishery commodity internationally. Grenada may consider submitting this queen conch assessment report to CITES Secretariat as part of its progress report in response to the ongoing RST recommendations. In addition, Grenada needs to prepare and submit its annual reports to the CITES Secretariat to lift the trade suspension for all CITES listed species.

In summary, as of 2022, Grenada has been subject to two separate trade suspensions under CITES a recommendation to suspend trade under CITES linked to its non- submission of annual reports (all trade of CITES listed Appendix II species including the queen conch) since 2013<sup>[10]</sup>, and another suspension linked to a CITES Review of Significant Trade (RST) for the queen conch since 2006. In May 2022, Grenada had provisionally avoided a third suspension under the National Legislation Project through the technical assistance of the Blue BioTrade<sup>[11]</sup>.

## **7. Study area**

The queen conch stock assessment was carried out in two principal fishing areas of Grenada (see figure 3). The first fishing area is Calliste in southern Grenada. The second fishing area is Carriacou, which is an island located north of Grenada. These two areas were identified as the principal queen conch fishing grounds by the Grenada Fisheries Division in consultation with fishers who participated in the stock assessment training workshop and other fisherfolks who traditionally conduct commercial fishing operations in these areas.

Figure 3. Political map of Grenada



Source: Peter Hermes Furian/Adobe Stock (2022).

## 8. Objectives

The goal is to assess the queen conch (*Strombus gigas*) population in two fishing areas in Grenada and estimate the potential yield of the resource in the two study areas.

The specific objectives were to determine the following (per fishing area):

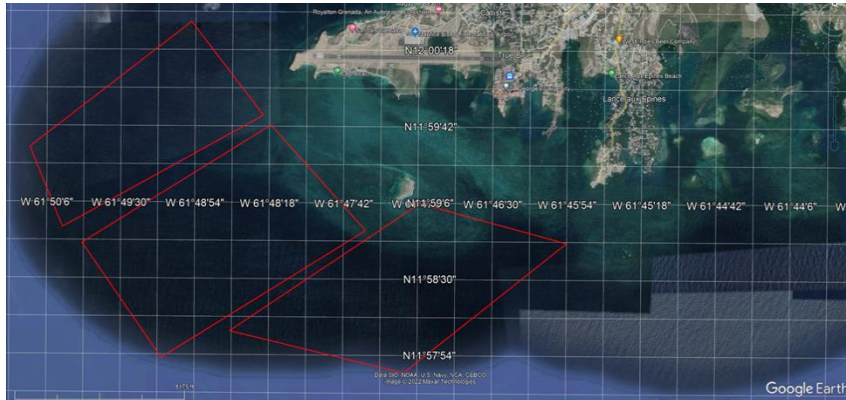
- a) Population structure
- b) Density
- c) Abundance
- d) Biomass
- e) Age structure
- f) Total Allowable Catch (TAC)

## 9. Materials and method

During a 2-day queen conch stock assessment workshop, participants including eight staff members of the Grenada Fisheries Division and five fishers from Calliste and Carriacou (virtual participation) benefited from various presentations (shared with Grenada Fisheries Division, CITES, UNCTAD and OECS), which included a method on how to carry out underwater queen conch surveys using belt-transects. Fishers provided information and identified on a map of Grenada their primary/traditional queen conch fishing grounds. This information was used to define the general boundary of each fishing

area in Calliste (see figure 4) and Carriacou (see figure 5) where the underwater surveys were carried out.

Figure 4. shows the Calliste queen conch fishing grounds (red markings) and was estimated at 1,748 hectares using Google Earth Pro/Show Ruler/Polygon.



Source: Google Earth Pro map (2022).

Figure 5. shows the Carriacou queen conch fishing grounds (red markings) and was estimated at 3,823 hectares using Google Earth Pro/Show Ruler/Polygon.



Source: Google Earth Pro map (2022).

## 10. Survey design

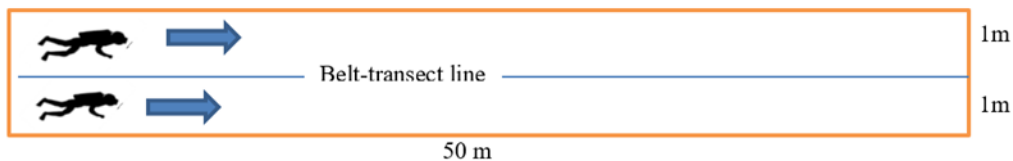
Once the queen fishing grounds were identified, random selection of sampling stations was done in accordance with the fishers' knowledge and experience in queen conch fishing over the last ten years. Also, this was done following the recommendations of CITES to carry out underwater field surveys in actual fishing grounds.

Only two fisher divers (certified divers and holders of valid National Health Insurance) were involved in the underwater field surveys at each fishing ground. Divers' personal safety and health was of utmost importance and therefore the number of dives per day were limited to standard dive protocols as recommended by Professional Association of Diving Instructors (PADI). The total number of dives for two days at each fishing area was as follows: five underwater dives/belt-transects in Calliste and six underwater dives/belt-transects in Carriacou. Weather conditions (choppy seas) and strong underwater/sea bottom currents played a significant role in the actual number of transects that were done at each study site/fishing area.

In this study professional queen conch fishers/divers were used to carry out the underwater field surveys because queen conchs are cryptic animals and so even an experienced and good diver may not detect a queen conch as easily. Therefore, for this reason the queen conch density is considered well estimated. Fishers' divers used scuba gear equipment to conduct underwater belt transects. This allowed for the successful deployment of 50-meter line transect on the sea floor. The line transects consisted of a 50m long - 5 mm thick fishing line with one 10-pound weight attached at each end of the line. Additionally, a 50m float line was also attached to one end of the transect line to secure the location of the line transect.

Figure 6 shows a diagram of how 2 divers swim along the 50-meter transect line with each diver covering a width of 1-meter on each side of the transect line.

Figure 6. Diagram showing divers swimming along belt-transect line.



Source: Gongora, M. (2022).

The two divers covered an area of  $100\text{m}^2$  for each transect. Each queen conch found along the belt transect line was collected, counted and its morphometric measurement was recorded. All queen conchs found in each belt-transect were placed in a basket that was hoisted onboard a vessel. Once onboard, measurements of each queen conch shell length were taken from the tip of the spire to the end of the siphonal canal, to the nearest millimeter using a measuring board. Additionally, the shell lip thickness taken at the mid-lateral region on the lip side of the shell was measured to the nearest 0.1 mm by using a Vernier caliper (see Fig. 7).



Figure 7. Measurement of queen conch shell lip thickness using a caliper



Source: Gongora, M. (2022).

All queen conch shell measurements were recorded on a field data collection sheet (see Annex 1) and later copied onto a spreadsheet for subsequent data processing and analysis. The field data was processed, cleaned, and analyzed using the ‘Analyze Data’ function of Microsoft Excel. The conch collected were returned to the seabed after morphometric measurements were taken.

a) Population density and abundance

The population density was estimated using the following formula.<sup>16</sup>

$$\bar{\bar{x}} = \sum_k \frac{A_k}{A} \bar{x}_k$$

Where:  $A$  is the area of the study and  $A_h$  the area of stratum  $h$  sampled,  $\bar{x}$  is the mean density for stratum  $h$

The abundance was estimated by multiplying the density of queen conch in a fishing area by the total area of the fishing ground (in this case the potential queen conch areas in Calliste and Carriacou).

b) Spatial distribution of conch

The spatial distribution of the queen conch in the sampling stations will be based on density and abundance.

<sup>16</sup> See <https://caribbeanfmc.com/reports-sci-docs/DR%20EHRHARDT/CONCH%20MANUAL.pdf>.

The population abundance estimate will be calculated as an extrapolation of the stratum abundance estimates to total population abundance. The population abundance in numbers of queen conch ( $P_h$ ) in stratum  $h$  is given by the following formula.<sup>17</sup>

$$P_h = \bar{D}_h * A_h$$

Variance of  $P_h$  is estimated by

$$Var(P_h) = A_h^2 \left( 1 - \frac{n_h}{N_h} \right) \left( \frac{S_h^2}{n_h} \right)$$

Total queen conch population abundance in a given fishing ground will be

$$P = \sum_{h=1}^r P_h$$

And the variance of the total population abundance estimate is also equal to the sum of the variance of the strata estimates. That is,

$$Var(P) = \sum_{h=1}^r Var(P_h)$$

The standard error of the population abundance,  $P$ , is estimated by

$$SE(P) = \sqrt{Var(P)}$$

The 95% confidence interval of the population abundance estimate is calculated by

$$P \pm t_{\alpha, n-1} SE(P)$$

Source: Nelson M. Ehrhardt and Monica Valle-Esquivel 2008. *Conch (Strombus gigas) Stock Assessment Manual. Caribbean Fishery Management Council.*

Where the population abundance in numbers of queen conch ( $P_h$ ) is calculated by multiplying the density in stratum  $h$  ( $D_h$ ) by the Area of stratum  $h$  ( $A_h$ ). The variance of the population  $Var(P_h)$  will be estimated using the square of the Area of stratum  $h$  ( $A_h$ ),  $n_h$  = number of animals found/counted in sampling unit,  $N_h$  = number of animals found/counted in stratum  $h$ ,  $S_h^2$  = square of standard deviation of stratum  $h$ .

The queen conch density and abundance in each fishing area was determined using the field data collected. This information is shown in a diagram showing the two fishing areas and their respective queen conch density and abundance.

### c) Estimation of biomass

The queen conch biomass available to the fishery was determined by multiplying the abundance (number of individual conch) in each fishing area by the average weight of each individual queen conch that has been partially processed (85% market clean) at sea. This project did not have as an objective the determination of the average weight of partially processed queen conch meat. However, interviews conducted with fishers indicate that the semi-processed queen conch meat weight is 8 oz per individual conch meat. Therefore, this weight was taken as the mean weight of each partially processed individual queen conch.

<sup>17</sup> See <https://caribbeanfmc.com/reports-sci-docs/DR%20EHRHARDT/CONCH%20MANUAL.pdf>

d) Total allowable catch limit

A precautionary Total Allowable Catch (TAC) limit was estimated as 25% of the volume of the queen conch biomass available to the fishery for a fishing season that may extend nine months (considering that a three-month closed fishing season may be established by the Government of Grenada in 2023).

## 11. Results

The analysis of the queen conch field data collected was done using Microsoft Excel. The ‘Data Analysis’ function of the Excel spread sheet was used in this study to generate summary statistics, tables and graphs of the queen conch shell length and shell lip thickness for Calliste.

Table 1 shows the summary statistics for queen conch shell length for Calliste. A total of 97 queen conchs were measured in this fishing area from five transects and the mean shell length was estimated at 21.7 centimeters (standard deviation 2.53, variance 6.4). The smallest shell length measured was 13 cm and the largest was 26.7 cm. The mode was 22.3 centimeters.

Table 2 shows the summary statistics for queen conch shell lip thickness for Calliste. The mean shell lip thickness was estimated at 16.67 millimeters (standard deviation 6.4, variance 41.2) and lip thickness varied from 2 millimeters to 29 millimeters. The mode was estimated at 17 mm.

Table 1. Summary statistics for queen conch shell length (cm) for Calliste

|                          |          |
|--------------------------|----------|
| Mean                     | 21.65979 |
| Standard Error           | 0.256884 |
| Median                   | 22.2     |
| Mode                     | 22.3     |
| Standard Deviation       | 2.530014 |
| Sample Variance          | 6.400971 |
| Kurtosis                 | 3.41084  |
| Skewness                 | -1.67893 |
| Range                    | 13.7     |
| Minimum                  | 13       |
| Maximum                  | 26.7     |
| Sum                      | 2101     |
| Count                    | 97       |
| Largest(1)               | 26.7     |
| Smallest(1)              | 13       |
| Confidence Level (95.0%) | 0.509911 |

Source: Gongora, M. (2022)

Table 2. Summary statistics for queen conch shell lip thickness (mm) for Calliste

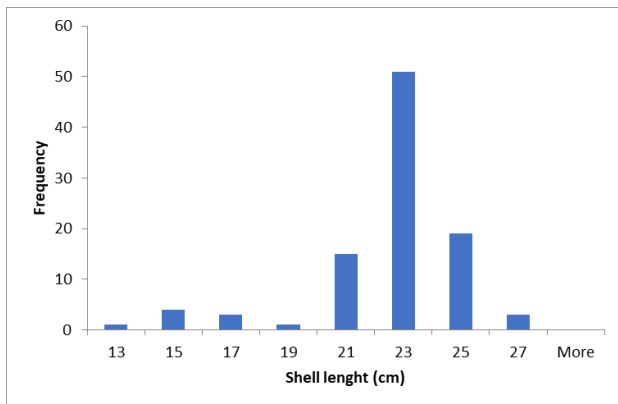
|                |             |
|----------------|-------------|
| Mean           | 16.67113402 |
| Standard Error | 0.651445588 |
| Median         | 18          |

|                          |              |
|--------------------------|--------------|
| Mode                     | 17           |
| Standard Deviation       | 6.415994966  |
| Sample Variance          | 41.16499141  |
| Kurtosis                 | 0.744706143  |
| Skewness                 | -1.008040665 |
| Range                    | 27           |
| Minimum                  | 2            |
| Maximum                  | 29           |
| Sum                      | 1617.1       |
| Count                    | 97           |
| Largest(1)               | 29           |
| Smallest(1)              | 2            |
| Confidence Level (95.0%) | 1.293109273  |

Source: Gongora, M. (2022)

Figure 8 shows the queen conch shell length frequency distribution in Calliste. Queen conch measuring 21 to 25 centimeters accounted for 87.63% of the sampled population, of which those animals measuring 23 centimeters in shell length accounted for 52.58% of the sampled population. Animals measuring 25 centimeters and 21 centimeters accounted for 19.59% and 15.46%, respectively.

Figure 8. Queen conch shell length frequency distribution in Calliste



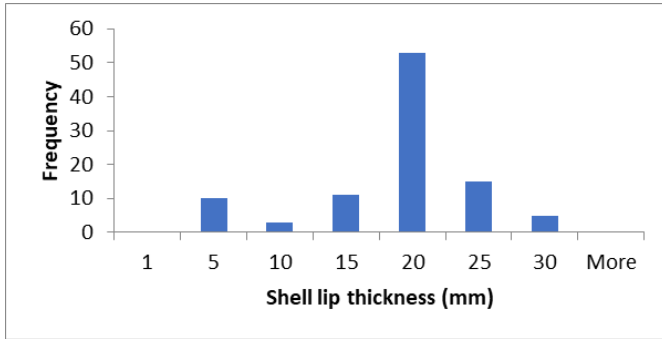
| Bin | Frequency | Cumulative % |
|-----|-----------|--------------|
| 13  | 1         | 1.03%        |
| 15  | 4         | 5.15%        |
| 17  | 3         | 8.25%        |
| 19  | 1         | 9.28%        |
| 21  | 15        | 24.74%       |
| 23  | 51        | 77.32%       |
| 25  | 19        | 96.91%       |
| 27  | 3         | 100.00%      |

Source: Gongora, M. (2022).

Figure 9 shows the queen conch shell lip thickness frequency distribution in Calliste. Queen conchs with shell lip thickness measuring 15 to 25 millimeters accounted for 81.45% of the population. Animal with a shell lip thickness of 20 millimeters accounted for 54.64% of the population.

Figure 9. Queen conch shell lip thickness frequency distribution in Calliste

| Bin | Frequency | Cumulative % |
|-----|-----------|--------------|
|-----|-----------|--------------|

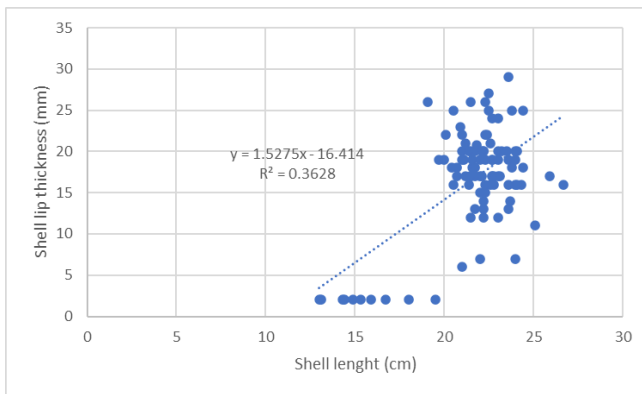


|    |    |         |
|----|----|---------|
| 1  | 0  | 0.00%   |
| 5  | 10 | 10.31%  |
| 10 | 3  | 13.40%  |
| 15 | 11 | 24.74%  |
| 20 | 53 | 79.38%  |
| 25 | 15 | 94.85%  |
| 30 | 5  | 100.00% |

Source: Gongora, M., (2022).

Figure 10 shows the linear relationship between queen conch shell length and lip thickness in Calliste. The value of r-squared (0.36) in the regression model ( $y = 1.5275x - 16.414$ ) indicates a low correlation between the independent variable (shell length) and the dependent variable (lip thickness). This could be explained by the fact that the majority (87.63% of sampled population) of individuals are between 21 to 25 centimeters in shell length and the majority (81.45%) of these individuals having a lip thickness of 15 to 25 millimeters, which is responsible for a poor relationship deriving from the low variability in the dataset.

Figure 10. Linear relationship between queen conch shell length and lip thickness in Calliste



Source: Gongora, M. (2022).

Table 3 shows the summary statistics for queen conch shell length for Carriacou. A total of 153 queen conchs were measured in this fishing area from six transects and the mean shell length was estimated at 21.5 centimeters (standard deviation 3.36, variance 11.31). The smallest shell length measured was 9 cm and the largest was 34 cm. The mode was estimated at 22 centimeters.

Table 4 shows the summary statistics for queen conch shell lip thickness for Carriacou. The mean shell lip thickness was estimated at 15.03 millimeters (standard deviation 8.09, variance 65.39). Shell lip thickness varied from 2 millimeters to 34 millimeters. The mode was estimated at 12 mm.

Table 3. Summary statistics for queen conch shell length (cm) for Carriacou

|                |             |
|----------------|-------------|
| Mean           | 21.49673203 |
| Standard Error | 0.271895363 |

|                         |              |
|-------------------------|--------------|
| Median                  | 21.5         |
| Mode                    | 22           |
| Standard Deviation      | 3.3631599    |
| Sample Variance         | 11.31084451  |
| Kurtosis                | 3.683687772  |
| Skewness                | -0.571279396 |
| Range                   | 25           |
| Minimum                 | 9            |
| Maximum                 | 34           |
| Sum                     | 3289         |
| Count                   | 153          |
| Largest(1)              | 34           |
| Smallest(1)             | 9            |
| Confidence Level(95.0%) | 0.537182017  |

Source: Gongora, M., (2022).

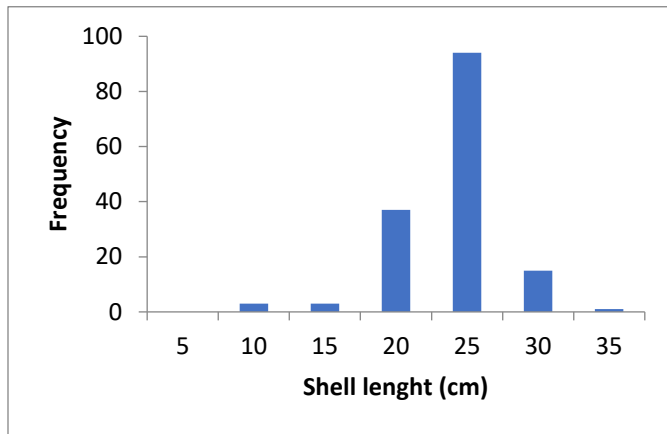
Table 4. Summary statistics for queen conch shell lip thickness (mm) for Carriacou

|                         |              |
|-------------------------|--------------|
| Mean                    | 15.03267974  |
| Standard Error          | 0.653732786  |
| Median                  | 16           |
| Mode                    | 12           |
| Standard Deviation      | 8.086227977  |
| Sample Variance         | 65.3870829   |
| Kurtosis                | -1.094851653 |
| Skewness                | 0.0600198    |
| Range                   | 32           |
| Minimum                 | 2            |
| Maximum                 | 34           |
| Sum                     | 2300         |
| Count                   | 153          |
| Largest(1)              | 34           |
| Smallest(1)             | 2            |
| Confidence Level(95.0%) | 1.291575895  |

Source: Gongora, M., (2022).

Figure 11 shows the shell length frequency distribution of queen conch in Carriacou. Queen conchs measuring 20 to 25 centimeters accounted for 85.62% of the sampled population. Animals measuring 25 centimeters in shell length accounted for 61.44% of the sampled population. Animals measuring 20 centimeters and 30 centimeters in shell length accounted for 24.18% and 9.81%, respectively.

Figure 11 Queen shell length frequency distribution in Carriacou

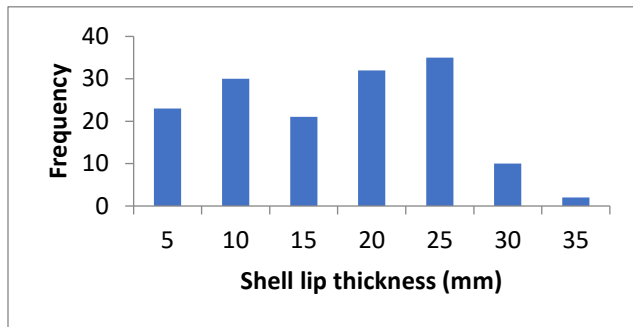


| <i>Bin</i> | <i>Frequency</i> | <i>Cumulative %</i> |
|------------|------------------|---------------------|
| 5          | 0                | 0.00%               |
| 10         | 3                | 1.96%               |
| 15         | 3                | 3.92%               |
| 20         | 37               | 28.10%              |
| 25         | 94               | 89.54%              |
| 30         | 15               | 99.35%              |
| 35         | 1                | 100.00%             |

Source: Gongora, M., (2022).

Figure 12 shows the queen conch shell lip thickness frequency distribution in Carriacou. Queen conchs shell lip thickness was broadly distributed between 5 to 30 millimeters; however, no specific lip thickness class accounted for more than 25%. Animals with a shell lip thickness of 25 millimeters (lip thickness with the highest percentage) represented 22.88% of the sampled population. The animals with the largest shell lip thickness (30 mm and 35 mm) and referred to as “mega spawners” accounted for 7.84% of the sampled population. Animals with the smallest lip thickness (5 mm and 10 mm), which are the youngest animals, accounted for 34.64% of the sampled population. These younger animals are considered recruits that have entered the fishery.

Figure 12. Queen conch shell lip thickness frequency distribution for Carriacou

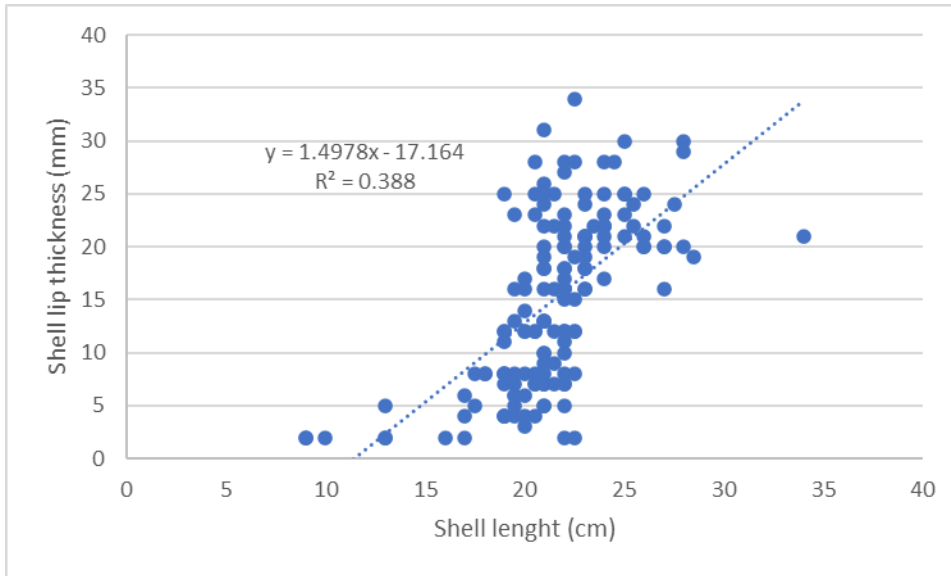


| <i>Bin</i> | <i>Frequency</i> | <i>Cumulative %</i> |
|------------|------------------|---------------------|
| 5          | 23               | 15.03%              |
| 10         | 30               | 34.64%              |
| 15         | 21               | 48.37%              |
| 20         | 32               | 69.28%              |
| 25         | 35               | 92.16%              |
| 30         | 10               | 98.69%              |
| 35         | 2                | 100.00%             |

Source: Gongora, M., (2022).

Figure 13 shows the relationship between queen conch shell length and lip thickness in Carriacou. The value of r-squared (0.38) in the regression model ( $y = 1.4978x - 17.164$ ) indicates a low correlation between the independent variable (shell length) and the dependent variable (lip thickness). The poor relationship is due to the low variability in the dataset. The results show that 38 percent of the variance in the lip thickness is explained by the shell length.

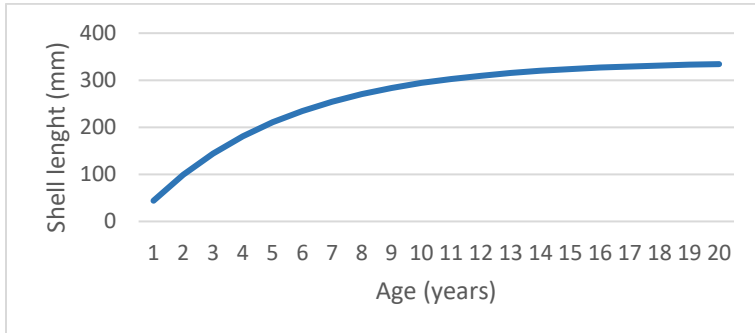
Figure 13. Linear relationship between the queen conch shell length and shell lip thickness in Carriacou.



Source: Gongora, M., (2022).

Figure 14 shows the queen conch growth curve in Calliste. It is noted that at ten years old, the growth of the queen conch shell starts to level off meaning that there is no substantial growth in the length of the shell but rather energy is spent on the thickening of the shell.

Figure 14. Queen conch growth curve in Calliste



Source: Gongora, M., (2022).

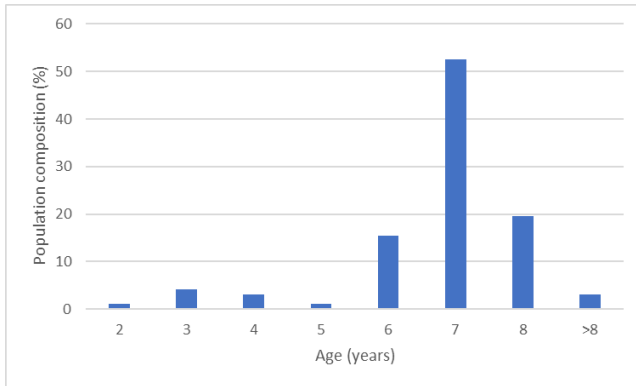
The population age structure was determined using the von Bertalanffy growth equation<sup>18</sup>  $L(a) = L_{\infty}(1 - \exp(-k(a - t_0)))$ . The growth parameters used in this study included a  $L_{\infty}$  (from this study) of 34 centimeters,  $k = 0.207$  and  $t_0 = 0.33$

Figure 15 shows the queen conch population age percentage composition in Calliste. Given that the largest shell length found in Calliste was 26.7 centimeters and after applying the von Bertalanffy growth equation, it was found that most of the sampled population were between six (6) and eight (8) years old. It was found out that 52.6% of the sampled population was seven (7) years old, followed by ages 8 and 6 comprising 19.6% and 15.5%, respectively.

<sup>18</sup> For more details, see [http://www.pisces-conservation.com/growthhelp/index.html?von\\_bertalanffy.htm](http://www.pisces-conservation.com/growthhelp/index.html?von_bertalanffy.htm).



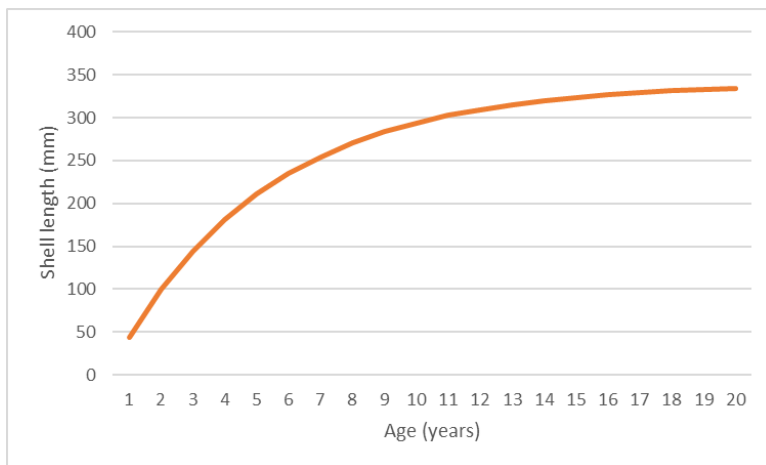
Figure 15. Queen conch age percentage composition in Calliste



Source: Gongora, M. (2022).

Figure 16 shows the queen conch growth curve in Carriacou. It is noted that after the queen conch becomes nine (9) years old the growth of the shell starts to level off meaning that there is no substantial growth of the shell but rather energy is spent in the thickening of the shell.

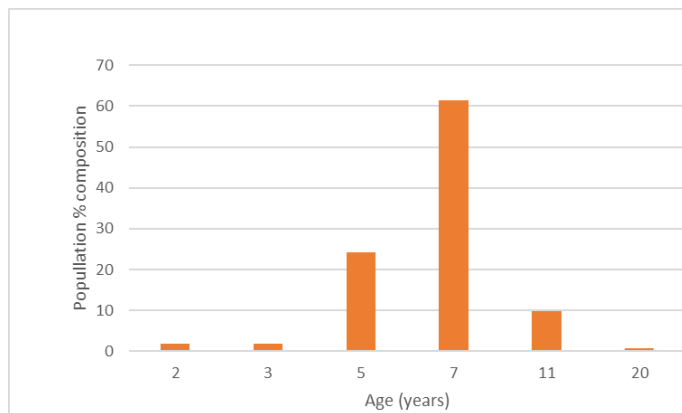
Figure 16. Queen conch growth curve in Carriacou



Source: Gongora, M. (2022).

Figure 17 shows the queen conch population age percentage composition in Carriacou. Given that the largest shell length found in Calliste was 34 centimeters and after applying the von Bertalffy growth equation it was found out that most of the sampled population were between five (5) and eleven (11) years old. It was found out that 61.4% of the sampled population was seven (7) years old, followed by ages 5 and 11 comprising 24.2% and 9.8%, respectively.

Figure 17. Queen conch age percentage composition in Carriacou



Source: Gongora, M., (2022).

Table 5 shows the estimated queen conch biomass of 217,626 pounds in Calliste. This biomass estimate responds to a recommendation made to Grenada under the Review of Significant Trade (4<sup>th</sup> Phase) in specimens of queen conch that was presented at the 19<sup>th</sup> meeting of the Animals Committee in 2003.

Table 5. Calliste fishing area queen conch mean density and biomass estimate.

| Transect No. | No. individuals | Transect Area (ha) | Mean Density | Conch fishing area | Abundance               | Biomass estimate | Biomass estimate |
|--------------|-----------------|--------------------|--------------|--------------------|-------------------------|------------------|------------------|
| 1            | 40              | 0.01               | 4000         | (ha)               | (numbers)               | (ounces)         | (pounds)         |
| 2            | 4               | 0.01               | 400          |                    |                         |                  |                  |
| 3            | 13              | 0.01               | 1300         |                    |                         |                  |                  |
| 4            | 32              | 0.01               | 3200         |                    |                         |                  |                  |
| 5            | 8               | 0.01               | 800          |                    |                         | 8                | 16               |
|              |                 | 0.05               |              | 1748               | 435,252                 | 3,482,016        | <b>217,626</b>   |
|              |                 |                    |              |                    | <b>Density estimate</b> | <b>249</b>       | <b>Conch/ha</b>  |

Source: Gongora, M. (2022).

Table 6 shows the estimated biomass of 1,289,080 pounds in Carriacou. This biomass estimate responds to a recommendation made to Grenada under the Review of Significant Trade (4<sup>th</sup> Phase) in specimens of queen conch that was presented at the 19<sup>th</sup> meeting of the Animals Committee in 2003.

Table 6. Carriacou fishing area queen conch mean density and biomass estimate.

| Transect No. | No. individuals | Transect Area (Ha) | Mean Density | Conch fishing area | Abundance | Biomass estimate | Biomass estimate |
|--------------|-----------------|--------------------|--------------|--------------------|-----------|------------------|------------------|
| 1            | 31              | 0.01               | 3100         | (ha)               | (numbers) | (ounces)         | (pounds)         |
| 2            | 35              | 0.01               | 3500         |                    |           |                  |                  |

|   |    |      |      |      |                         |            |                  |
|---|----|------|------|------|-------------------------|------------|------------------|
| 3 | 6  | 0.01 | 600  |      |                         |            |                  |
| 4 | 23 | 0.01 | 2300 |      |                         |            |                  |
| 5 | 25 | 0.01 | 2500 |      |                         | 8          | 16               |
| 6 | 33 | 0.01 | 3300 | 3848 | 2,578,160               | 20,625,280 | <b>1,289,080</b> |
|   |    | 0.06 |      |      |                         |            |                  |
|   |    |      |      |      | <b>Density estimate</b> | <b>670</b> | <b>Conch/ha</b>  |

Source: Gongora, M., (2022).

## 12. Discussion

The mean shell length for queen conch in Calliste was estimated at 21.7 centimeters (standard deviation 2.53, variance 6.4). The smallest shell length measured was 13 cm and the largest was 26.7 cm and the mode was 22.3 centimeters. These results are very similar to those obtained for Carriacou where the mean shell length was estimated at 21.5 centimeters (standard deviation 3.36, variance 11.31). The smallest shell length measured was 9 cm and the largest was 34 cm and the mode was 22 centimeters. The queen conch mean shell in the study sites in Grenada exceed the mean shell length of Belize, which in 2022 was estimated at 15.2 cm, The great difference is that the Grenada queen conch are primarily adult and mature individuals while in Belize the majority are sub adults, but annual recruitment is consistent and high.

The shell length mean and mode in both fishing areas in Grenada are very similar indicating the presence of a single population. Animals of the same size could indicate inbreeding in the population and this genetic anomaly is passed from generation to generation. The shell length, however, does not affect the health nor the trading of the queen conch meat originating from Calliste and Carriacou. A genetic study of the queen population in Grenada can provide clarity on current homogeneity of shell length sizes potentially due to inbreeding. If the fisheries authorities consider it appropriate following a detailed assessment of the potential advantages and disadvantages to the queen conch population, the introduction of new genetic material from other jurisdictions into the local population can be done through the hatching of eggs in a land-based queen conch hatchery facility to produce juveniles. It can also be done through the in-situ mating of queen conch from Grenada with queen conch from other jurisdictions. The introduction of new genetic material into the local queen conch population could be addressed through the current OECS Regional Queen Conch Plan of Action, which among other objectives is considering the development and construction of a land-based conch hatchery facility to improve the genetic composition and boost the queen conch population in the OECS. This can be done through the sourcing of suitable egg masses from other jurisdictions in the Caribbean region (such as Belize) for subsequent hatching and mass production of juveniles for seeding of known queen conch habitats in the OECS countries. A queen conch hatchery in the Turks and Caicos successfully hatched and reared juvenile queen conch in a hatch facility from egg masses that were collected in Belize in the mid 1990's (Gongora, M. 2022).

In Calliste, queen conch measuring 21 to 25 centimeters in shell length accounted for 87.63% of the sampled population and those measuring 23 centimeters accounted for 52.58% of the sampled population. In Carriacou, queen conchs measuring 20 to 25 centimeters in shell length accounted for 85.62% of the sampled population and those measuring 25 centimeters in shell length accounted for 61.44% of the sampled population. This result indicates that in both fishing areas more than 85% of queen conch were between 20 to 25 centimeters in shell length. As previously mentioned, this is a very important reason why extreme caution (low harvesting levels plus potential closed season) should be exercised in the

harvesting of these “mega spawners”. Queen conch sampled in Carriacou were slightly larger than those sampled in Calliste.

In a Queen Conch Stock Assessment and Management Workshop<sup>19</sup> done in 1990 (organized by Caribbean Fishery Management Council and the Caribbean Resource Assessment and Management Program) it was reported that a queen conch stock assessment for Grenada was not done due to inadequate data, which prevented the analyses from obtaining any firm conclusions on the conch stock. Total catches were lacking, and meat weights only comprised of large mature individuals. None of the available stock assessment methods could deal with this situation. Problems in the data were identified and suggestions made to improve data collection. In the 1990 workshop report it is noted that export annual quotas set by countries should not be detrimental to reproductive (mating) success. In this regard, some queen conch scientists have made certain recommendations including as a density of 50 (for queen conch population sustainability) and 100 (for queen conch reproductive success) adult queen conch per hectare as being the basis for queen conch sustainability and mating viability, the results of this project show that **adult queen conch** density in Grenada is almost **460 adult** individuals per hectare and therefore Grenada is well above the said densities for queen conch sustainability and mating viability.

A density of 249 conchs and 670 conchs per hectare was found in Calliste and Carriacou, respectively. Overall, the mean queen conch density was estimated at **459.5 queen conch** per hectare in the two sites surveyed. It is noted that in the two study areas, very mature adult conchs were found, counted, and measured. The queen conch population being fished in the two study sites consists primarily of an adult spawning population known as “mega spawners”. Great caution must be exercised as well as sound management measures and harvest strategy should be implemented when harvesting “mega spawners” because these are the animals that produce the largest number of eggs and over-exploitation of this portion of the population can lead to a quick and severe overfishing of the queen conch stock in a short period of time. The maintenance and/or reduction of fishing effort should be prioritized to ensure the sustainability and continued long-term viability of the queen conch stock in Grenada. It is not clear why the queen conch in Grenada are very old. It is possible that the stock aged due to the lack of fishing effort for many years. Alternatively, it may be that queen conch in the two study areas have been targeted at low levels only given the current low fishing effort (based on information provided by fishers).

Queen conch abundance in Calliste was estimated at 435,252 individuals while in Carriacou the abundance was 2,578,160 individuals giving an estimated biomass available to the fishery of 217,626 lbs and 1,289,080 lbs, respectively based on individual meat weight of eight ounces. When added together the estimated biomass in the two fishing areas amount to 1,506,706 lbs. **To ensure the sound management and conservation of the queen conch in Grenada, a precautionary catch quota of 376,676 lbs (54,407 lbs from Calliste and 322,270 lbs from Carriacou) representing only 25% of available biomass is being recommended for a fishing season.** These results would satisfy a recommendation made under Review of Significant Trade (4<sup>th</sup> Phase) in specimens of queen conch that was presented at the 19th meeting of the Animals Committee in 2003. **The Government of Grenada is also strongly recommended to introduce legislation for a closed fishing season (during the peak spawning season) of a least three months in 2023.**

The mean shell lip thickness of 16.67 millimeters (sd 6.4, variance 41.2) in Calliste varied from 2 millimeters to 29 millimeters with a mode of 17 mm. In Carriacou, the mean shell lip thickness is 15.03

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<sup>19</sup> BelizeConchWGReportFinal.PDF (caribbeanfmc.com). For more information see :<https://caribbeanfmc.com/reports-sci-docs/BelizeConchWGReportFinal.PDF>

millimeters (standard variation 8.09, variance 65.39) and varied from 2 millimeters to 34 millimeters with a mode was 12 mm. This result indicates that mean shell lip thickness was similar in both fishing areas however the range in Carriacou was slightly larger than in Calliste, but the mode was thicker in Calliste. Queen conch sampled in Calliste are older than in Carriacou. In fact, queen conch shells in Calliste were so old that “breaking a hole” on the soft shell (the structural integrity of the shell weakens after the animal has become old) to remove the animal was an easy task compared to queen conch shells from Carriacou where they were much harder to break. Lip thickness is the most reliable indicator for maturity in queen conch. Boman *et al.* (2018)<sup>20</sup> suggested that a 15 mm minimum lip thickness would be appropriate for most of the Caribbean region. The primary goal of a minimum lip thickness is that queen conch will have at least one season after reaching sexual maturity to mate and spawn,<sup>21</sup> **The Government of Grenada may also consider passing legislation to establish a queen conch minimum shell lip thickness of 10 mm.**

This study found that in Calliste queen conch of ages six to eight years old dominated the sampled population; with age seven (7) and older representing 52.6% of the sampled population and queen conch of age 8 comprised 19.6%; while in Carriacou the queen conch of age seven and older represented 61.4% of the sampled population and queen conch of age five (5) comprised 24.2%. In Carriacou it was also found out that queen conch aged 11 years comprised 9.8% of the sampled population. Overall, the results show that on average 57% of the sampled population were at least seven years old. Interestingly, in Carriacou animals aged five years old were found in the sampled population and the oldest animals (11 years) were also found there. These results indicate that the queen conch population in Carriacou is more broadly distributed and larger in shell length and older than in Calliste. It also means that there is higher recruitment (considering the broader distribution of size classes) in Carriacou given that younger individuals (five years old) were found in the sampled population. Consequently, it also means that the harvest strategy in Carriacou could be slightly different than in Calliste where the bulk of the population is one-size shell length and shell lip thickness, indicating low recruitment in this fishing area.

It is noted that in Calliste the largest queen conch shell length measured was 26.7 centimeters and in Carriacou the largest was 34 centimeters. The estimation of age in queen conch is complicated because of the nature of the two growth phases of the animal. It is noted that the von Bertalanffy growth equation takes into consideration the growth in the first phase of the queen conch shell growth and not necessarily the second phase after the animal has reached its maximum shell length at a certain age and then it starts to thicken its shell lip as it becomes older. For this reason, the queen conch in Grenada could be much older than that estimated age using the von Bertalanffy growth equation. Also, since the shell lip thickness at both fishing areas are similar, it can be assumed that queen conch age in Grenada is eight years and older. At present, there is no other proven scientific method to determine the age of queen conch, but shell lip thickness is a good indicator of age, the thicker the shell lip the older the animal.

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<sup>20</sup> Boman et al. (2018). Variability in size at maturity and reproductive season of queen conch *Lobatus gigas* (Gastropoda: Strombidae) in the Wider Caribbean Region.

<sup>21</sup> [Federal Register: Endangered and Threatened Wildlife and Plants: Proposed Rule to List the Queen Conch as Threatened Under the Endangered Species Act \(ESA\).](#)

### 13. Conclusion

The main conclusions of this study are as follows:

- a) Currently, the queen conch population of Grenada is healthy with an estimated density of 249 and 670 queen conch per hectare in Calliste and Carriacou, respectively. These densities are higher than the 100-adult conch per hectare that the National Oceanic and Atmospheric Administration of the United States government (NOAA) is currently using as a criterion needed for successful reproduction and viability of the queen conch population.
- b) A large portion of the population (85%) in the two study areas is composed of animals measuring 20 to 25 cm in shell length and 15 mm in shell lip thickness. The similar shell length and lip thickness in the study areas suggest that it is a single population.
- c) In the two study areas the queen conch are very mature adult individuals referred to as “mega spawners”.
- d) Lack of sound management measures and good harvest strategy could result in overfishing of mega spawners that can trigger a rapid decline of the health and reproductive capacity of the local population.
- e) The fishing effort should not exceed the proposed TAC.
- f) The queen conch meat did not show any distinguishing characteristics that would indicate an inferior meat quality.
- g) Queen conch abundance in Calliste was estimated at 435,252 individuals while in Carriacou the abundance was 2,578,160 individuals giving an estimated biomass available to the fishery of 217,626 lbs and 1,289,080 lbs, respectively. When combined the two fishing areas have an estimated biomass of 1,506,706 lbs.

### 14. Recommendations

#### Recommendations for Grenada policy makers

- a) The good management, conservation and sustainable use of the Grenada queen conch requires policy decisions and government actions such as **updating of the Grenada Fisheries Act, 1986 (Chap 108)**.<sup>22</sup>
- b) To ensure the sound management and conservation of the queen conch in Grenada a **precautionary catch quota** of 376,676 lbs (54,407 lbs from Calliste and 322,270 lbs from Carriacou) representing only 25% of total available biomass is recommended.
- c) Queen conch catch landings **data collection** (monthly) and stock assessment (at least every two years) is strongly recommended to gather information on spatial and temporal changes in the population parameters for improved management and conservation of queen conch over time. These activities are in line with the queen conch RST of 2003, the International Queen Conch Initiative, the RQCMCP and the Blue BioTrade Regional Plan of Action for the Eastern Caribbean queen conch value chain
- d) A **closed fishing season** extending at least three months during the queen conch peak spawning period (for e.g., July – September) is also strongly recommended. Fisher participants of the queen conch stock assessment training workshop said they supported a closed fishing season to protect the queen conch spawning season. Such support is contingent on a local or sub-regional action to

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<sup>22</sup> [Microsoft Word - Cap108.doc \(grenadaparliament.gd\)](#)

commensurate with similar measures that may be implemented in nearby fishing grounds/jurisdictions.

- e) In order to comply with CITES recommendations made under the queen conch RST of 2003, the International Queen Conch Initiative,<sup>23</sup> the RQCMCP and the Blue BioTrade Regional Plan of Action for the Eastern Caribbean queen conch value chain, it is necessary for the Government of Grenada to pass **suitable CITES legislation** (a trade suspension under the CITES national legislation project was narrowly avoided in 2022 when Grenada agreed to pass its CITES legislation but is still pending).~~[[OBJ]]~~
- f) There is a need to also introduce legislation for the **licensing of small-scale fishers and vessels**, to: (i) carry out sustained enforcement of fisheries regulations; (ii) prepare a queen conch management strategy and action plan; (iii) conduct of periodic queen conch field stock assessments, research, data collection and monitoring.
- g) Provide sufficient **resources for the execution of actions** that were identified as priority actions by the Grenada Fisheries Division that are outlined in **OECS Blue BioTrade Action Plan** for the queen conch value chain in the Eastern Caribbean.<sup>24</sup>
- h) Source expertise from the Caribbean region or elsewhere to **develop the capacity of the Grenada Fisheries Division** to enable it to perform its queen conch management and conservation activities successfully and effectively.
- i) Consider introducing a **national export tax for CITES listed species and/or an CITES export permit fee** to cover management costs, periodic assessments, monitoring and verification as well as the reporting by CITES focal points. Such a system could be set at the regional level under the OECS coordination and oversight.
- j) Explore **additional uses and markets for queen conch by-products** for the biotech, cosmetic, fertilizer and handicraft industries all in line with Blue BioTrade Principles and Criteria as well as CITES regulations,<sup>25</sup>

## Recommendations for Grenada Fisheries Division

- a) This queen conch stock assessment report should be adapted and/or endorsed by the Grenada Fisheries Division and submitted to CITES in support of the **establishment of a national catch quota for export of queen conch meat to foreign markets**.
- b) A **precautionary Total Allowable Catch limit** of 376,676 lbs (54,407 lbs from Calliste and 322,270 lbs from Carriacou) of conch meat, which represents only 25% of the total estimated biomass of 1,506,706 lbs for a fishing season is recommended. Adjustments of the TAC in the future should be based on results of periodic field monitoring of the queen conch population.
- c) The **licensing of fishers and fishing vessels** is strongly advised to comply with CITES recommendations. This will help Grenada to develop its CITES Legal Acquisition Findings that is required for queen conch meat exportation that will benefit the fishers and exporters.
- d) A **closed fishing season** extending at least three months during the queen conch peak spawning period (for e.g., July – September) should be legislated and implemented as soon as possible. Fishers would need to be further consulted on this recommendation.

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<sup>23</sup> For the full text see, CITES [Notification 2003/057 \(cites.org\)](https://www.cites.org/eng/doc/2003/057).

<sup>24</sup> UNCTAD and OECS (2022b). The Blue BioTrade regional plan of action for the Eastern Caribbean queen conch value chain. See <https://unctad.org/webflyer/blue-biotrade-regional-plan-action-eastern-caribbean-queen-conch-value-chain>

<sup>25</sup> See <https://unctad.org/webflyer/blue-biotrade-grenada-developing-value-sustainable-trade-and-production-queen-conch>.

- e) Sustained catch landings **data collection** (monthly) and field monitoring of the queen conch population in Grenada should be done at least every two (2) years to gather information on spatial and temporal changes in the population structure, density, and abundance at the national scale to improve the management and conservation of queen conch.
- f) Queen conch **sampling and biomass estimation** should be done in other fishing areas not sampled under this project.
- g) The abundance of queen conch in Grenada can support a **fishery directed for the export market**.
- h) To ensure good management and conservation of queen conch population, **stock assessments** should be carried out at least every 2 years.

### **Recommendations for National CITES Management Authority**

- a) To prepare outstanding national annual CITES reports (2016 – 2021) and submit to CITES as a priority. The CITES reports should include details of all CITES certificates issued for the export of CITES listed species including plants and animals.
- b) To support the development and enactment of a national CITES implementing legislation.
- c) To develop the CITES certificate system<sup>26</sup> for Grenada and train the staff on how to prepare and issue the certificates to exporters. In the case of queen conch shipments, a part of the process involves the inspection of catch landings data reported by fishers and verified with data collected from processors and exporters and physical inspection of shipment for compliance with the national queen conch regulations. It is also recommended that electronic systems should be set up to lower cost, e-permits and traceability of CITES permits given.
- d) To propose to CITES Secretariat and Animals Committee an export quota of 376,676 lbs (54,407 lbs from Calliste and 322,270 lbs from Carriacou) of conch meat.

### **Recommendations for other stakeholders (fishers, conservation community, academia, and industry)**

- a) To become more engaged and participate more in the management and conservation of queen conch in Grenada. Once the queen conch is well managed in Grenada, everyone will benefit from sustainable harvesting and conservation efforts of the fishery.
- b) To contribute towards the work of the Grenada Fisheries Division especially as it relates to the carrying out of queen conch stock assessment (i.e., contributing of their labor, skills and local expert knowledge).

## **15. Proposed plan of action**

The Grenada Fisheries Division along with Ministry of Agriculture & Lands, Fisheries & Cooperatives, Fisheries Division, Forestry Division and CITES Secretariat are developing a queen conch work plan for the achievement of the primary objective of lifting of the CITES suspension that would allow Grenada to

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<sup>26</sup> [https://cites.org/eng/news/pr/2014/CITES\\_UNCTAD](https://cites.org/eng/news/pr/2014/CITES_UNCTAD) and <https://cites.org/eng/prog/eCITES>



export queen conch meat and by-products to foreign markets. Some of the actions have already been discussed and validated at the OECS Regional Queen Conch Plan of Action with the support of UNCTAD and CITES in 2022.

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## 17. Appendices.

### 1. Agenda for Queen Conch Stock Assessment Workshop



**Organisation of  
Eastern Caribbean States**



European Union



**“Seizing the trade and business potential of Blue BioTrade products for promoting sustainable livelihoods and conservation of marine diversity in selected Organisation of Eastern Caribbean States (OECS) countries Project”  
(UNCTAD-OECS Blue BioTrade project)**

**Queen Conch Stock Assessment Workshop**  
Grenada Fisheries Division Conference Room  
St. George's, Grenada  
17-18 October 2022  
8 a.m.- 5 p.m.

### Tentative Programme


| DAY 1: 17 October 2022 |                                 |   |
|------------------------|---------------------------------|---|
| Time                   | Activity                        | Speaker/Facilitator   |
| 8 – 8:30 a.m.          | Registration of Participants    | Grenada Fisheries Division (GFD)  |
| 8:30 – 9 a.m.          | Welcome and opening remarks     | <b>Mr. Aaron Francois</b> , Permanent Secretary, Ministry of Trade, Industry, Co-operative & CARICOM Affairs, Government of Grenada (tbc)<br><br><b>Blue BioTrade in the Eastern Caribbean partners:</b><br><br><ul style="list-style-type: none"> <li>• <b>Mr. David Vivas Eugui</b>, Legal Officer, UNCTAD</li> <li>• <b>Mr. Lench Fevrier</b>, Technical Specialist (Agriculture), OECS</li> <li>• <b>Ms. Karen Gaynor</b>, Scientific Officer, CITES</li> </ul> |
| 9 - 9:15 a.m.          | CITES and Grenada's queen conch | <b>Ms. Karen Gaynor</b> , Scientific Officer CITES  |
| 9:15 – 9:30 a.m.       | <b>BREAK</b>                    |   |
| 9:30 – 11 a.m.         | Actions needed to lift CITES    | <b>Mr. Mauro Gongora</b> , UNCTAD –   |

|                               |   |  |
|-------------------------------|---|--|
|                               | queen conch trade ban against Grenada                                   | OECS Blue BioTrade Fisheries Expert (Consultant)<br><br><i>Comments by:</i><br><ul style="list-style-type: none"> <li>• <b>Mr. Lench Fevrier</b>, Technical Specialist (Agriculture), OECS</li> <li>• <b>Ms. Karen Gaynor</b>, Scientific Officer CITES</li> </ul> |
| 11 – 11:30 a.m.               | Queen conch fishery-dependent data collection for improved management   | Consultant   |
| 11:30 – 12 nn                 | Queen conch fishery-independent data collection for improved management | Consultant   |
| 12 nn – 1 p.m.                | <b>LUNCH</b>  |  |
| 1- 2:30 p.m.                  | Queen conch data collection method in the field                         | Consultant   |
| 2:30 – 3 p.m.                 | Taking of morphometric measurements in the field                        | Consultant   |
| 3 – 4                         | Loading and cleaning of field data (mock exercise)                      | Consultant   |
| 4 – 4:15                      | <b>BREAK</b>  |  |
| 4:15 – 5 p.m.                 | Testing of field data for human errors                                  | Consultant   |
| 5p.m.                         | <b>End of Day 1</b>   |  |
| <b>Day 2: 18 October 2022</b> |   |  |
| <b>Time</b>                   | <b>Activity</b>   | <b>Speaker/Facilitator</b>   |
| 8– 8:30 a.m.                  | Registration of participants  | Grenada Fisheries Division   |
| 8:30 – 10:30 a.m.             | Queen conch field data analysis (mock exercise)                         | Consultant   |
| 10:30 – 10:45 a.m.            | <b>BREAK</b>  |  |
| 10:45 – 12 nn                 | Queen conch field data analysis exercise (mock)                         | Consultant   |
| 12 nn– 2 p.m.                 | <b>LUNCH</b>  |  |
| 2 – 3:30 p.m.                 | Interpretation of results (Part 1)                                      | Consultant   |
| 3:30 – 3:45 p.m.              | <b>BREAK</b>  |  |
| 3:45 – 4:30 p.m.              | Interpretation of results (Part 2)                                      | Consultant   |
| 4:30 – 4:50 p.m.              | Details of queen conch field data collection (Carriacou and Calliste)   | Consultant   |
| 4:50 – 5 p.m.                 | Closing remarks   | <b>Mr. Aaron Francois</b> , Permanent Secretary, Ministry of Trade, Industry, Co-operative & CARICOM Affairs, Government of Grenada  |

|       |              |
|-------|--------------|
|       | (tbc)        |
| 17:00 | End of Day 2 |

2. List of participants of the Queen Conch Stock Assessment Workshop. Grenada Fisheries Division Conference Room. St. George's, Grenada. 17-18 October 2022

**Participants' list**  
Grenada queen conch stock assessment  
17-22 October 2022



| No.      | First name     | Surname   | Title  | Job title         | Organization | Country   | Gender  | Stakeholder group | Email 1                     |                           |
|----------|----------------|-----------|--------|-------------------|--------------|-----------|---------|-------------------|-----------------------------|---------------------------|
| 17/10/22 | Nydanu Ju      | Tisenth   |        | Market Supervisor | Fisheries    | Grenada   | M       |                   | Nydanu/nydanu@stjohn.gov.gd |                           |
|          | Maximo         | Gongora   |        | Fisheries Officer | Rel. Fish    | Belm      | M       |                   | miegongora@hotmail.com      |                           |
|          | IMBERTA        | Paul      |        | Chief Supervisor  | Fisheries    | Grenada   | F       |                   | 0179209@gmail.com           |                           |
|          | Cherene        | Bowen     |        | Data Clerk        | Fisheries    | Grenada   | F       |                   | cherene.bowen@stjohn.gov.gd |                           |
|          | Ant            | Wise      |        | Diver             | Full Circle  | Grenada   | M       |                   | st.wyse@stjohn.gov.gd       |                           |
|          | Alph           | Greenidge |        | Diver             | Full Circle  | Grenada   | M       |                   | davidbrank2@gmail.com       |                           |
|          | Phillip        | Grenville |        | Supervisor        | Fisheries    | Grenada   | M       |                   |                             |                           |
|          | John           | Grenville |        | Water Clerk       | Fisheries    | Grenada   | M       |                   |                             |                           |
|          | Sony - St John |           |        | Supervisor        | Malville Str | Grenada   | M       |                   | sonystjohn1073@gmail.com    |                           |
|          | Richard        | Arnold    |        | Data Clerk        | Fisheries    | Grenada   | M       |                   | RichardArnold87@gmail.com   |                           |
|          | Kimberly       | Lewis     |        | Data Clerk        | Fisheries    | Grenada   | F       |                   | Jessicacharles624@gmail.com |                           |
|          | Jerry          | Charles   |        |                   |              | Grenada   | F       |                   |                             |                           |
|          | 18/10/22       | Richard   | Arnold |                   | Supervisor   | Fisheries | Grenada | M                 |                             | RichardArnold87@gmail.com |
|          |                | Cherene   | Bowen  |                   | Data Clerk   | Fisheries | Grenada | F                 |                             | cherene.bowen@yahoo.com   |
| Richard  |                | Arnold    |        | Data Clerk        | Fisheries    | Grenada   | M       |                   |                             |                           |
| Cherene  |                | Bowen     |        | Supervisor        | Fisheries    | Grenada   | F       |                   |                             |                           |
| Ant      |                | Wise      |        | Diver             | Full Circle  | Grenada   | M       |                   | st.wyse@stjohn.gov.gd       |                           |
| Alph     |                | Greenidge |        | Diver             | Full Circle  | Grenada   | M       |                   | davidbrank2@gmail.com       |                           |
| John     |                | Grenville |        | Supervisor        | Fish Market  | Grenada   | M       |                   | sonystjohn1073@gmail.com    |                           |
| Jerry    |                | Charles   |        | Supervisor        | Fisheries    | Grenada   | F       |                   | Jessicacharles624@gmail.com |                           |
| Kimberly |                | Lewis     |        | Data Clerk        | Fisheries    | Grenada   | F       |                   |                             |                           |

3. Queen conch underwater survey data collection sheet 2022 template



## Grenada Fisheries Division

### Queen Conch Underwater Survey Data Collection Sheet 2022

Date: \_\_\_\_\_ Sampling station: \_\_\_\_\_ Transect No. \_\_\_\_\_ Sheet No. \_\_\_\_\_

Team members: \_\_\_\_\_ Transect length & width (m): \_\_\_\_\_

| Start GPS Coordinates :16Q |            |                   |                    |  | UTM: |            |                   |                    |  |
|----------------------------|------------|-------------------|--------------------|--|------|------------|-------------------|--------------------|--|
| End GPS Coordinates:16Q    |            |                   |                    |  | UTM: |            |                   |                    |  |
| No.                        | Depth (ft) | Shell Length (mm) | Lip Thickness (mm) | Comments and habitat type (note if conch has egg mass or are mating) | No.  | Depth (ft) | Shell Length (mm) | Lip Thickness (mm) | Comments and habitat type (note if conch has egg mass or are mating) |
|                            |            |                   |                    |  |      |            |                   |                    |  |
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|           |           |                  |         |                 |          |           |               |                        |                         |
|-----------|-----------|------------------|---------|-----------------|----------|-----------|---------------|------------------------|-------------------------|
| A - Algae | C - Coral | CR- Coral Rubble | M - mud | PR – Patch Reef | S - sand | SI - silt | Sg- sea grass | DnSg – dense Sea grass | SpSg – sparse Sea grass |
|-----------|-----------|------------------|---------|-----------------|----------|-----------|---------------|------------------------|-------------------------|

Table 7 shows a proposed queen conch action plan for Grenada that provides details of the main actions that would need to be undertaken that will assist Grenada to move towards the lifting of the CITES trade suspensions. The full collaboration of the Ministry of Agriculture & Lands, Fisheries & Cooperatives, Fisheries Division, Forestry Division and CITES Focal Point is hugely important for the achievement of the primary objective of lifting of the CITES suspension that would allow Grenada to export queen conch

meat and by-products to foreign markets. Some of the actions have already been discussed and validated at the OECS Regional Queen Conch Plan of Action with the support of UNCTAD and CITES in 2022.<sup>27</sup>

Table 7. Proposed queen conch action plan for Grenada

| Action  | Deadline                 | Responsible Party   | Estimated cost                  | Notes  | Recommendation being addressed     |
|---|--------------------------|---|---------------------------------|--|------------------------------------|
| a. Enactment of suitable legislation including updating of the Fisheries Act and introduction of enabling legislation.                | By December 2023         | Attorney General and Ministries of Legal Affairs, Agriculture & Lands, Fisheries & Cooperatives and Fisheries Division                    | N/A                             | The support of the Office of the Attorney General is necessary for updating of Fisheries Act and introduction of enabling legislation  | RQCMCP                             |
| b. Passing of national CITES legislation and appointment of National CITES Focal Point, Management Authority and Scientific Authority | By October 2023          | Attorney General and Ministries of Legal Affairs, Agriculture & Lands, Fisheries & Cooperatives, Fisheries Division and Forestry Division | US\$20,000                      | Hiring of a consultant may be necessary  | CITES National legislation project |
| c. Licensing of fishers and fishing vessels   | By October 2023          | Grenada Fisheries Division  | US\$5,000                       | Acquisition of computer hardware and software and establishment of a fishers' registry and licensing system for fishers and vessels will need to be developed and implemented. | RQCMCP                             |
| d. Carry out periodic stock assessments   | Next stock assessment by | Grenada Fisheries Division  | US\$10,000 per stock assessment | Training of Grenada Fisheries  | CITES RST 2003                     |

<sup>27</sup> See [https://unctad.org/system/files/official-document/tcsditcinf2022d7\\_en.pdf](https://unctad.org/system/files/official-document/tcsditcinf2022d7_en.pdf).

|   |   |   |     |  |   |
|---|---|---|-----|--|---|
|   | October 2024 and every 2 years thereafter |   |     | Division staff members is necessary  |   |
| e. Preparation of outstanding national annual CITES reports (2016 – 2021) and submission to CITES Secretariat   | By May 2023                               | Grenada Fisheries and Forestry Divisions  | N/A | Fisheries and Forestry divisions need to work together to prepare the annual reports   | CITES Animals Committee and Secretariat |
| f. A national queen conch stock assessment report should be produced and endorsed by the Grenada Fisheries Division and submitted to CITES Secretariat through the CITES National Focal Point | By April 2023                             | Grenada Fisheries Division in collaboration with the CITES National Focal Point | N/A | The national report is necessary to support the implementation of a national catch quota for export of queen conch meat to foreign markets.        | CITES RST 2003                          |
| g. Declaration of a national catch quota  | By April 2023                             | Grenada CITES Focal Point   | N/A | A formal stock assessment report including a declaration of national catch quota needs to be submitted to CITES Secretariat and Animals Committee. | CITES Secretariat                       |
| h. Training of staff of Management Authority in the issuing of CITES permits  | By April 2023                             | CITES Management Authority (Grenada)  | N/A | Training of CITES Management Authority staff in the preparation and issuing of CITES permits is very important                                     | CITES Secretariat                       |



|  |                  |   |     |  |              |
|--|------------------|---|-----|--|--------------|
| i. Propose a national export tax and a fishing license fee for queen conch and other CITES-listed species            | By October 2023  | Attorney General and Ministries of Legal Affairs, Agriculture & Lands, Fisheries & Cooperatives, Fisheries Division | N/A | Political support will be needed to approve a bill setting taxes or fees to cover for relevant costs   | This project |
| j. Compliance with most urgent recommendations of the WECAFC - Regional Queen Conch Conservation and Management Plan | By December 2023 | Grenada Fisheries Division  | N/A | Fulfilment of recommendations in the WECAFC – RQCMCP will help Grenada to advance its efforts to get CITES to lift trade suspension in queen conch | RQCMCP       |

Source: Gongora, M., 2022.