

**REPORT OF THE CONSULTATION TO REVIEW
QUEEN CONCH FISHERIES AND RESOURCES**

CRFM Technical & Advisory Document - Number 2018 / 11

Report of the Consultation to Review Queen Conch Fisheries and Resources

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CRFM Secretariat
Belize, 2018

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Report of the Consultation to Review Queen Conch Fisheries and Resources

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LIST OF ACRONYMS AND ABBREVIATIONS

BZE	Belize
CFMC	Caribbean Fishery Management Council
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPUE	Catch Per Unit of Effort
CRFM	Caribbean Regional Fisheries Mechanism
EC	Eastern Caribbean
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information System
GPS	Global Positioning System
IUU	Illegal, Unreported and Unregulated fishing
MSY	Maximum Sustainable Yield
NDF	Non-Detriment Findings
NTAC	National Total Allowable Catch
OSPESCA	Central American Fisheries and Aquaculture Organization (Organización del Sector Pesquero y Acuícola del Istmo Centroamericano)
RGRRA	Research Graduate, Research and Resource Assessment
TAC	Total Allowable Catch
VMS	Vessel Monitoring System
WECAFC	Western Central Atlantic Fishery Commission

1. WELCOME AND OPENING REMARK

The meeting was called to order at 8:30 a.m. BZE time (9:30 a.m. JAM time and 10:30 a.m. EC time) by Dr. Maren Headley, Research Graduate, Research and Resource Assessment (RGRRA), CRFM Secretariat. The RGRRA then invited participants to introduce themselves, so that a register of attendance could be taken. The List of Participants is given at Appendix 1.

2. ADOPTION OF AGENDA

The RGRRA provided an overview of the meeting objectives and the items to be discussed. There were no changes made to the agenda and it was adopted. The Agenda is given at Appendix 2.

3. PROCEDURAL MATTERS – ELECTION OF CHAIRPERSON

Dr. Headley indicated that as it was an informal meeting, she would chair the meeting.

4. UPDATE ON IMPLEMENTATION STATUS OF QUEEN CONCH MANAGEMENT MEASURES

Dr. Headley presented this item. The document is given at Appendix 3. Dr. Headley explained that she had contacted several Member States regarding national conversion factors and had circulated a survey to gather information on the status of implementation of the queen conch management measures as set out in the regional queen conch management plan. Four (4) Member States responded: The Bahamas, Belize, Jamaica and Turks and Caicos Islands. Dr. Headley then presented a summary of the survey responses as these related to the short-term, mid-term, and long-term management measures set out in the management plan. In general, given the commercial importance of queen conch, the CRFM Member States have made significant improvements in the management of their fisheries at the national levels. However, given the differences in scales, gears, products, markets and geographic locations of the CRFM Member States, harmonization of regional management measures has not occurred as yet. Following her presentation, Dr. Headley invited the meeting participants to share some of the challenges they had experienced in the implementation of the regional queen conch management plan and the specific management measures, and to propose some actions that could be taken for improvement.

In relation to the management measure, *Improvement of catch and effort monitoring programme* it was clarified that the pilot study was limited to one island, but efforts were being made to roll out a full national program for the Bahamas.

With regard to the use of conversion factors, the Meeting was advised that Prof. Ehrhardt, University of Miami, was preparing a presentation for the 3rd CFMC/OSPESCA/ WECAFC/CRFM/CITES Working Group on Queen Conch meeting scheduled to be held at the end of October 2018, during which he would provide an update on the status of implementation of the conversion factors. The meeting was reminded that at the 2nd CFMC/OSPESCA/ WECAFC/CRFM/CITES Working Group on Queen Conch meeting a lot of work, including sampling of different products had been done and Antigua and Barbuda, Belize and Saint Lucia had produced country-specific conversion factors. A query was raised regarding whether countries were using the conversion factors to report on processed products that they exported. It was explained that the purpose for developing conversion factors was to facilitate reporting to FAO on conch production in live/nominal¹ weight rather than for reporting on exports. CITES had also agreed that

¹ Live/nominal weight is defined as the complete animal including the shell.

countries should include conversion factors on their CITES certificates from January 2018. It was indicated that meat weights rather than live weights were usually reported for queen conch at the national levels. Antigua and Barbuda confirmed the use of country specific conversion factors to convert meat weight to live weight and Belize indicated that national conversion factors will be used for reporting to CITES and FAO in the upcoming year.

Reference was made to the FAO FISHStatJ database in which landings were recorded as live weight. There was some discussion about how landings were reported to FAO, bearing in mind the different levels of processing. It was queried whether the meat weight was reported along with explanations on the processing level and if the conversion factor was then applied by FAO. The Meeting noted that FAO was particularly interested in the reporting of landings at live weight and would apply the 7.5 average conversion factor to landings not reported as live weight even if the processing level had not been specified. It was pointed out that the FAO default conversion factor of 7.5 was intended for countries that did not have national conversion factors. The meeting discussed the challenges with using an average conversion factor of 7.5 which included conch being landed in various forms and unknown proportions, and processing grades not being specified. Application of an average regional conversion factor did not take these elements into consideration and could result in inaccurate live weights.

It was recommended that care should be exercised when establishing country-specific conversion factors particularly in relation to different presentations and different processed levels of queen conch; there must be a clear separation of the conversion factors for the different levels of processing. In determining the conversion factors, it was important to sample all the different sizes of conch which were normally harvested and to sample throughout the entire fishing area. Following further discussions, the meeting acknowledged that there was a high degree of variability of the conversion factors which vary from year to year; place to place; and by maturity. Further, different conversion factors were required for each life stage of the conch – juvenile, sub-adult, adult, and stone. The differences in the maturity stages, whether male or female, the level of processing, the state of the fishery, morphological differences depending on location, and market requirements all influence the determination of the conversion factors. These parameters vary, sometimes markedly, from country to country, hence the importance for Member States to collect the required data and to develop their own national conversion factors.

Conclusions

1. CRFM Member States have made significant improvements in the management of their fisheries at the national levels. However, given the differences in scales, gears, products, markets and geographic locations of the CRFM Member States, harmonization of regional management measures has not occurred as yet.
2. CRFM Member States have not yet implemented the updated regional conversion factors recommended in the 2017 Regional Queen Conch Fisheries Management and Conservation Plan.
3. In general, for the majority of CRFM Member States meat weights rather than live weights are reported for queen conch at the national level.
4. Antigua and Barbuda confirmed the use of country specific conversion factors to convert meat weight to live weight and Belize indicated that national conversion factors will be used for reporting to CITES and FAO in the upcoming year.
5. Challenges with using an average conversion factor of 7.5 include:
 - a. Conch being landed in different forms (e.g. dirty vs clean) and unknown proportions in some countries;
 - b. Countries not specifying the processing grade of the product;
 - c. Variations in the definitions of processing grades between countries and even processing plants.

6. Additionally, regional conversion factors do not account for the influences of shell morphology, maturity stages and fishing areas on meat weight at the country level.

Recommendations

1. In the absence of national conversion factors, the FAO average of 7.5 can be used, however, to ensure accuracy in data reporting it was recommended that Member States should develop their own country-specific conversion factors that take into account their local situation.

5. REVIEW OF QUEEN CONCH LANDINGS IN CRFM MEMBER STATES AND VERIFICATION OF LANDINGS DATA

Dr. Headley presented this item. The document is given at Appendix 4. Dr. Headley's presentation included a brief background to the Review, a summary of the landings trends, and threats and possible causes for the declines. Data from the FISHStatJ database for the period 1975 to 2016 for the WECAFC area and the CRFM Member States were used in the Review. Landings in the WECAFC area ranged from 8,025 t in 1977 (minimum) to 47,010 t in 1994 (maximum). Over the 41 year period, CRFM Members States had minimum landings of ~6,000 t in 1977 to a maximum of ~30,000 t in 2016. In 1977, landings from CRFM Member States accounted for about 81% of the total catches in the WECAFC area, but this fell to around 43% by 2015. The reason for the percentage shift was unclear but it could be due to several factors including poaching by neighbouring countries, IUU fishing, reduced fishing effort; this required further investigation as hurricanes and changing fishing grounds could also affect landings. In relation to cumulative production over the review period, in the Greater Antilles Jamaica was the main producer with a total of around 200,000 t; while in the Lesser Antilles Antigua and Barbuda was the main producer with approximately 22,000 t. Generally, the graphs indicated a gradual increase and then a decrease. Several reasons have been offered to explain this trend including overfishing, moratoria and quotas for export, as well as threats to the queen conch resource such as the biological characteristics of the queen conch, human impacts, climate change, environmental phenomena, hurricanes, and diseases and parasites.

The discussions following the presentation focused on possible reasons for the declines in landings. Some of the reasons advanced by the meeting to explain the observed declines included the introduction of quota systems, in which case the landings reflect the total allowable catches (TACs); reduction of TAC based on observations of decreased conch during abundance surveys over the years; the targeting of more than one fishery by the same fisher or group of fishers which results in decreased fishing effort for queen conch; and introduction of new management measures such as quotas/caps on fishing vessels, closed seasons, etc.

It was further explained that a fundamental problem was the tendency to use landings as an indication of what was occurring with the resource. CPUE was a more realistic indicator of trends as there was a mixture of a number of different scales of fisheries (e.g. small-scale vs industrial) at different stages – open access, limited entry and fisheries with quotas. Also, some fishers target more than one fishery and switch their efforts in keeping with market demand. For example, when there was a fall off in demand for lobster from the hotel sector, lobster fishers re-directed their efforts to conch. It was also very important for countries to submit their meta-data, which provided explanations for major changes in landings.

The Meeting observed that the information presented showed a general decline in conch production throughout the region. However, it was noted that for countries such as Belize where fishing effort did not vary significantly, continuous decline was a cause for concern. Such a declining pattern required investigation to determine causes and also to consider ways to address these issues. The importance of

understanding what was actually occurring in the fishery and the need to collect CPUE data were re-emphasized. It was suggested that the trend in CPUE should be examined to determine whether it was a significant negative trend or was it a part of another cycle with natural fluctuations over time.

In 2012, at least five CRFM countries had peak production, which could be explained by a number of factors, including high recruitment to the fishery in the previous year. However, there appears to be a general decline after 2012. Reasons suggested for this declining trend included effects of hurricanes; reduction of TACs as a precautionary measure; declines in conch densities in some countries; longer time to locate the animals, possibly related to climate change; decrease in market demand; and diversion of effort to other fisheries (lobster). It was further noted that landing trends could also be affected by the use of the 7.5 conversion factor given the possibility of either overestimation or underestimation of live weight.

In terms of measuring CPUE, this varied between Member States and included *catch per man per day*; and *kg dirty meat weight per 80 cft scuba tank*. It was observed that a precise CPUE measure such as kg dirty meat weight per 80 cft scuba tank may present challenges for comparison.

With regard to the upcoming CFMC/OSPESCA/WECAFC/CRFM/CITES Working Group on Queen Conch meeting in Panama at the end of October, a query was raised as to whether the CRFM (Member States and Secretariat) was going to the meeting with a certain position on conch in the region and, if so, what was this position. In response, Dr. Headley indicated that she was expected to make a presentation on the status of implementation of the Management Plan in the CRFM Member States and any challenges Member States may have. It was expected that some of the management measures will be updated, so in terms of a position, CRFM could state some of the difficulties faced in collecting catch and effort data and calculating CPUE. Non-detriment findings, related to CITES, could also be looked at. It was agreed that the report of this meeting would be circulated to meeting participants for review by Friday, 26 October 2018 and the finalized report could be incorporated into CRFM's presentation to the CFMC/OSPESCA/WECAFC/CRFM/CITES Working Group on Queen Conch.

It was also suggested that as a general rule, countries should always make it clear that they were responding to the status in their conch fisheries and there was no need for CITES to intervene or to change the listing of queen conch.

Conclusions

1. In 2012, at least five CRFM countries had peak production, however, there was a general decline after 2012. Reasons suggested for this declining trend included effects of hurricanes; reduction of TACs as a precautionary measure; declines in conch densities in some countries; decrease in market demand; and diversion of fishing effort to other fisheries (lobster).
2. The use of landings as an indication of resource status was not reliable given that there was a mixture of a number of different scales of fisheries (e.g. small-scale vs industrial) at different stages – open access, limited entry and fisheries with quotas. CPUE was considered to be a better indicator to monitor overtime and allow for comparisons.

Recommendations

1. In order to improve data analysis it was recommended that countries:
 - a. Determine CPUE by fishing area and fishing gear for queen conch;
 - b. Indicate the amount of queen conch specified by the TAC/annual quota when presenting data (e.g. graphs) in order to provide context;
 - c. Consider the influence of market demands and prices on fishing effort when analysing CPUE data.

6. ANY OTHER BUSINESS

Dr. Headley used the opportunity to request that countries which had not yet done so, to complete and submit the survey.

7. CLOSING REMARKS AND ADJOURNMENT

Dr. Headley thanked everyone for taking the time to attend the meeting and for the useful information provided.

Following other expressions of thanks by participants, the meeting adjourned at 10:32 a.m. BZE time (11:32 a.m. Jamaica time; and 12:32 p.m. EC time).

APPENDIX 1: LIST OF MEETING PARTICIPANTS

Country	Name & Designation	Address	Email Contact
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APPENDIX 2: DRAFT AGENDA

**CARIBBEAN REGIONAL FISHERIES MECHANISM
SECRETARIAT**

Electronic Meeting

Friday, 19 October 2018

(8:30AM – 10:30 AM Belize Time)

Document date: 14 Sep 2018

DRAFT AGENDA-Consultation to review queen conch fisheries and resources

1. Welcome and Opening Remarks (8:30-8:35)
2. Adoption of draft agenda and overview of meeting objectives (8:35)
3. Procedural Matters – Election of chairperson (8:35-8:40)
4. Update on Implementation Status of Queen Conch Management Measures – Presentation of summarized information from surveys completed by countries, identification of implementation challenges and actions for improvement: Maren Headley (15 minutes presentation and 30 minutes for clarifications/questions) (8:40-9:25)
5. Review of queen conch landings in CRFM Member States and verification of landings data – Presentation of summarized landings trends and identification of possible causes and measures to address them, and country data verification: Maren Headley (15 minutes presentation and 45 minutes for clarifications/questions) (9:25 - 10:10)
6. Any Other Business (10:10-10:25)
7. Closing Remarks and Adjournment (10:25-10:30)

APPENDIX 3: STATUS OF IMPLEMENTATION OF QUEEN CONCH MANAGEMENT MEASURES IN CRFM MEMBER STATES

Table 1: Implementation status of recommended short-term management measures.

Short-term management measures	The Bahamas	Belize	Jamaica	TCI
1. National queen conch meat conversion factors ² .	Adoption of conversion factors specific to The Bahamas is currently under consideration	Completed	No available data that will account for individual weight of the animal from shell to final processing grade since 1997.	Sent these in the previous email
2. Improvement of catch and effort monitoring programmes.	A pilot study has been completed and national implementation is planned	Queen conch catch and effort data collection and monitoring is ongoing and significant improvements have been done in the last few years.	Since 2015, The Fisheries Division has received funding through the Fisheries Management and Development Fund (local fund supported by cess imposed on conch) to monitor landings of both conch and lobster industrial vessels and includes the hiring of Fishery Data Collectors specific to this assignment. In addition, quota holders are required to provide a notification of departure and arrival for each fishing trip and upon offloading a Fishery Inspector is required to inspect vessel log sheets.	Continued collection with Plant operators.
3. Closed seasons.	Currently being considered along with other measures	Yes, there is 3-month closed season (1 July – 30 September) each year.	Close seasons are gazetted annually and may vary from year to year. The latest close season commences 31 st August	Opening for 2017 fishing season was 1 month late (November 15) because of damages from

² If there are national conversion factors, please summarize how they are calculated in the table.

Short-term management measures	The Bahamas	Belize	Jamaica	TCI
			2018 and ends 28 th February 2019. Previous close season was 1 st September 2017 to 1 st April 2018	hurricanes. Expected to return to October 15 for the 2018 fishing season.
4. Non-Detriment Findings (NDF) for export of queen conch meat and its by-products.	NDFs are currently under revision	A Queen conch management plan was developed in December 2014 and implemented in 2015. National surveys are done bi-annually to set Total Allowable Catch limits per fishing season. The management plan and results of surveys contain elements for development of an NDF. The NDF is expected to be done for the 2019 fishing season.	Jamaica has conducted six (6) such conch abundance surveys, the most recent of which was conducted during 2015 with a scheduled one for 2018. The analyses conducted took into consideration earlier estimates of population densities (conch/ha) and abundance (population size); a description of population structure (size/age) and the maximum sustainable yield (MSY). In the absence of abundance surveys (which are recommended to be done every 3-5 years) a series of reviews of the annual catch and effort data were used to help determine the National Total Allowable Catches (NTAC's).	All exports are recorded and made sure not to surpass the export quota.
5. Licensing of all queen conch fishers, processors and exporters.	All processors and exporters require a license. Licensing of all fishers is under consideration.	All fishers, vessels, processors and exporters are licensed.	The Fisheries Division is responsible for the licensing of all fishers and vessels that are involved in the queen conch fishery. This is done annually. The Veterinary Services Division licence fishing	Continued licensing for each fisher, vessel and processing plant (for export).

Short-term management measures	The Bahamas	Belize	Jamaica	TCI
			vessels and processing plants to harvest product for human consumption.	
6. Adoption of stricter regulations on autonomous diving techniques.	The use of SCUBA for fishing has been banned	Use of SCUBA gear or hookah for conch fishing is prohibited since 1977.	-	All divers are only allowed to “free-dive”. No use of scuba.
7. Organized patrolling.	This is in effect and is conducted by the Royal Bahamas Defence Force as well as Dept. of Marine Resources staff.	Yes, patrolling is done as frequently as possible but enforcement is still challenging due to large fishing area and insufficient human and material resources.	The Jamaica Defense Force Coast Guard is responsible for monitoring, control and surveillance activities in the offshore areas and EEZ, defending and protecting the sovereignty of Jamaica from external forces or threats.	Unsure
8. Extended use of satellite-based VMS systems for boats with a length exceeding 10 metres.	This has not been implemented but is under consideration	Not yet implemented but a pilot project to equip a percentage of fishing vessels with VMS systems (through external assistance) will soon be implemented in the artisanal fishing fleet.	GPS data loggers are primarily used by fishing vessels.	Vessel are under 10 meters.
9. Continuous education and outreach programmes for stakeholders.	In effect and conducted by various partner organizations.	Education and outreach programmes are on-going throughout the year. Fishermen cooperatives actively participate in conch meetings.	Annual fishing industry retreat hosted by the Ministry of Industry, Commerce, Agriculture and Fisheries has been held and provides the medium for this.	Limited.

Table 2: Implementation status of recommended mid-term management measures.

Middle-term management measures	The Bahamas	Belize	Jamaica	TCI
10. National level queen conch conservation and management plans.	Plans have been drafted but are in need of updating.	A Belize Queen Conch Management Plan was developed and implemented in 2015	QUEEN CONCH FISHERY MANAGEMENT PLAN written by two consultants - Martha C. Prada and Richard S. Appeldoorn - was finalised in 2017.	Provided in previous email.
11. Traceability of queen conch throughout the value chain.	Traceability is possible but the ability to do this varies by processing plant.	Not yet implemented but licensing of fishers and vessels per fishing area since its full implementation in January 2017 provides an opportunity to collect catch data per fishing area by fisher. This project will be implemented in 2019.	There is an ongoing study that looks at the genetic composition of queen conch stocks in Jamaica and other neighboring countries. There is a concise system in place to monitor queen conch products. At the end of each fishing trip, the captains are required to submit a vessel log of products harvest. Transport certificates are issued based on the quantities landed to take products to processing plant. Health, export and catch certificates are issued for export purposes.	Landings are obtained from Processing facilities and exports are recorded.
12. Develop collaborative arrangement needed to generate habitat maps at the scale needed for better fisheries management.	A collaborative arrangement is not in place. However, low resolution habitat maps have been developed with the aid of remote sensing.	The Fisheries Department has developed Queen conch habitat maps along the coast of Belize. This allows for strategic sampling in underwater surveys to gather conch density and abundance data.	Jamaica is currently exploring partnership in this area.	Currently looking into training in December with habitat mapping and GIS.

13. Adoption of sub-regional mechanisms to evaluate the fishery potential of queen conch using fishery dependent and independent factors.	To be discussed as a region	Belize has adopted CRFM, OSPESCA and WECAFC mechanisms to conduct stock assessment activities.	Jamaica has a mature fishery in terms of assessment and management and can contribute to the sub-region.	Currently working with dependent factors.
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Table 3: Implementation status of long-term management measure.

Long-term management measure	The Bahamas	Belize	Jamaica	TCI
14. Progressive inclusion of co-management strategies.	The draft fisheries act provides a stronger legal basis for co-management. The act is expected to be considered towards the end of 2018.	Belize Fisheries Department has signed co-management agreements for management of marine protected areas with several non-governmental organizations (including Turneffe Atoll Sustainability Association, Southern Environmental Alliance and Toledo Institute for Development and Environment) for many years. Personnel attached to these organizations are authorized by the Minister responsible for fisheries to enforce the national fisheries laws.	Jamaica has a mature fishery in terms of assessment and management and can contribute to the sub-region.	Unsure.

APPENDIX 4: REVIEW OF QUEEN CONCH LANDINGS IN CRFM MEMBER STATES

Background

Regional queen conch landings have fluctuated over the years and recently declines have been observed in some countries. This decrease has been largely attributed to overfishing, however reductions in landings have also been due to the implementation of management measures aimed at improving production and promoting conservation; specifically, closed areas, longer closed seasons and/or reductions in the total allowable catch (TAC)³. Overall queen conch landings also declined following the temporary moratoria on trade for some countries as a result of the application of CITES Significant Trade Review findings.

The 31st Executive Committee Meeting expressed concern about the declines in queen conch landings and recommended urgent action in reviewing landings trends throughout the CRFM Member States, identifying possible causes and addressing them. Therefore, the objective of this review is to provide a base for discussion by the countries and determination of the next steps in addressing queen conch landing declines.

Results

Regional trends during 1975-2016 were reviewed based on FAO FishStatJ data. WECAFC landings ranged from a minimum of 8,025 t in 1977 to a maximum of 47,010 t in 1994. Over the last ten-year period, landings increased from 31,413 t in 2006 to 32,487 t in 2016 with annual fluctuations (Figure 1). Peak WECAFC Member States landings within this ten-year period occurred in 2013 (38,410 t). It should be noted that in recent years there has been a significant increase in landings from Nicaragua and this is most likely due to the fishery being reopened after the civil war.

Landings by CRFM Member States also followed a similar trend over the 41-year period and ranged from a minimum of 6,524 t in 1977 to a maximum of 30,386 t in 2016. However, within the last ten-year period, landings declined from 21,020 t in 2006 to 15,000 t in 2016 (Figure 1). Peak landings for this ten-year period occurred in 2015 (24,036 t). Landings from CRFM Member States accounted for a maximum of 81% of the total catches in the WECAFC area in 1977 to a minimum of 43% in 2015. The reason for this percentage shift is unclear and could be due to several factors including poaching by neighbouring countries and IUU fishing. This decline deserves further investigation since changes in fishing effort due to hurricanes, or resource distribution can also influence landings.

Given the variations in geographic locations and production scales, the landings for CRFM Member States were separated into two groups for analysis. Group 1 consisted of Jamaica, Haiti, Belize, Bahamas, and Turks and Caicos Islands, whereas Group 2 consisted of Antigua and Barbuda, St. Kitts and Nevis, Anguilla, Grenada, and Saint Lucia and St. Vincent and the Grenadines.

The cumulative production for Group 1 by country over the 41-year period was Jamaica (200,161 t); Turks and Caicos Islands (194,533t); the Bahamas (164,992 t); Belize (72,567 t); and Haiti (9,510 t). Landings trends for these countries are presented in Figure 2 and the minimum and maximum historical landings by year during the period 1975-2016 are summarized below:

Bahamas: Minimum: 1,560 t (1978) – Maximum: 6, 435 t (2008)

³ 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.

Belize: Minimum: 722 t (1978) – Maximum: 3,626 t (2012)
Haiti: Minimum: 150 t (1984) – Maximum: 400 t (1996)
Jamaica: Minimum: 3,000 t (2008) – Maximum: 17,250 t (1994)
Turks and Caicos Islands: Minimum: 2170 t (2014) – Maximum: 7,223 t (1996)

More recent minimum and maximum historical landings by year during the period 2006-2016 and landings for the year 2016 are summarized by country below:

Bahamas: Minimum: 2,696 t (2016) – Maximum: 6,435 t (2008); 2,696 t (2016)
Belize: Minimum: 1,969 t (2007) – Maximum: 3,626 t (2012); 2,776 t (2016)
Haiti: Minimum: 150 t (2010) – Maximum: 300 t (2007); 200t (2016)
Jamaica: Minimum: 3,000 t (2008) – Maximum: 4,875 t (2006); 3,750 t (2016)
Turks and Caicos Islands: Minimum: 2,170 t (2014) – Maximum: 6,569 t (2009); 2,500 t (2016)

The cumulative production for Group 2 by country over the 41-year period was Antigua and Barbuda (22,232 t); St. Kitts and Nevis (16,913 t); Saint Lucia (5,871 t); St. Vincent and the Grenadines (3,827 t); Anguilla (3,251 t); Grenada (554 t). Landings trends for these countries are presented in Figure 3 and the minimum and maximum historical landings by year are summarized below:

Anguilla: Minimum: 26 t (1945) – Maximum: 339 t (2012)
Antigua and Barbuda: Minimum: 90 t (1989) – Maximum: 3,937 t (2012)
Grenada: Minimum: 1 t (1994) – Maximum: 39 t (2013)
St. Kitts and Nevis: Minimum: 166 t (1994) – Maximum: 1,864 t (2012)
St. Lucia: Minimum: 11 t (1988) – Maximum: 514 t (2015)
St. Vincent and the Grenadines: Minimum: 11 t (1991) – Maximum: 435 t (2014)

It should be noted that historical landings minima for the Eastern Group have not occurred in this century.

More recent minimum and maximum historical landings by year during the period 2006-2016 and landings for the year 2016 are summarized by country below:

Anguilla: Minimum: 42 t (2016) – Maximum: 339 t (2012); 42 t (2016)
Antigua and Barbuda: Minimum: 446 t (2006) – Maximum: 3,937 t (2012); 1580 t (2016)
Grenada: Minimum: 1 t (2010) – Maximum: 39 t (2013); 26 t (2016)
St. Kitts and Nevis: Minimum: 471 t (2014) – Maximum: 1,864 t (2012); 648 t (2016)
St. Lucia: Minimum: 148 t (2010) – Maximum: 514 t (2015); 488 t (2016)
St. Vincent and the Grenadines: Minimum: 27 t (2006) – Maximum: 435 t (2014); 294 t (2016)

The results highlight that within the most recent ten-year period for which data are available, the differences between the minimum and maximum landings are considerable and in general there is a negative trend overtime which requires further investigation.

It should be noted that for some countries landings are FAO estimates. This issue was discussed by the 2nd CFMC/OSPESCA/WECAFC/CRFM/CITES Working Group on Queen Conch in 2014 and it was recommended that there was a need for FAO to identify the data sources and methodologies used to derive these estimates. However, this task remains to be addressed.

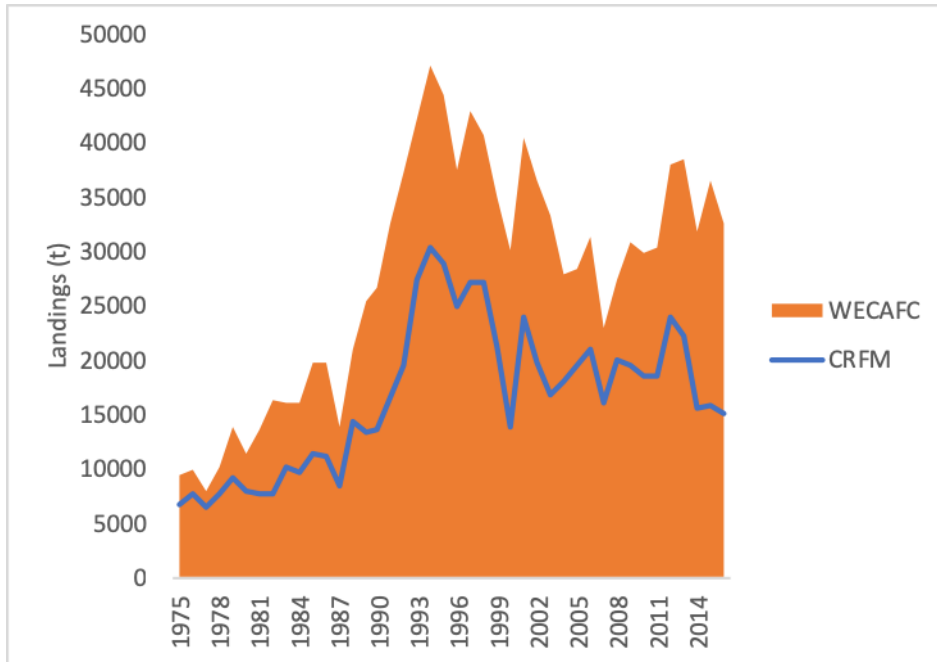


Figure 1: Annual queen conch landings for WECAFC and CRFM Member States (1975-2016). Source: FAO (2017).

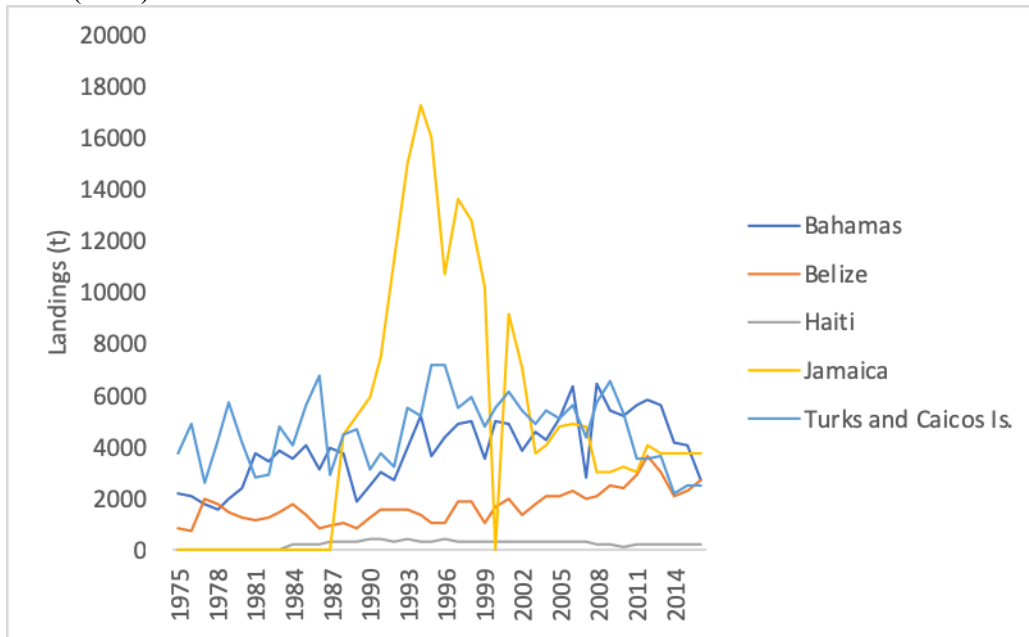


Figure 2: Group 1- Annual queen conch landings for the CRFM Member States within the Greater Antilles, Belize, Bahamas and TCI (1975-2016). Source: FAO (2017).

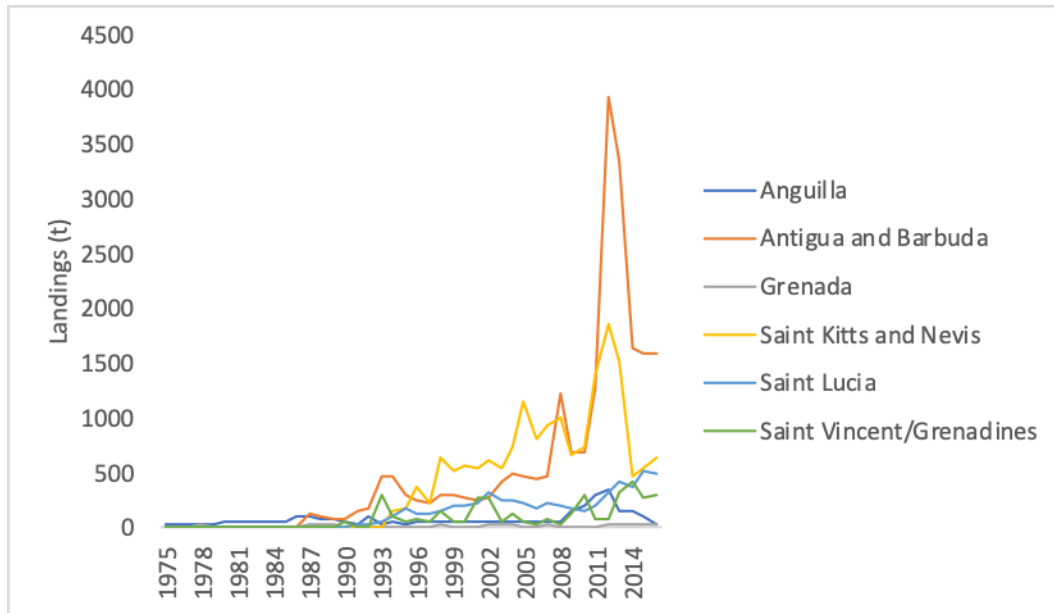


Figure 3: Group 2 - Annual queen conch landings for CRFM Member States within the Lesser Antilles (1975-2016). Source: FAO (2017).

In addition to overfishing, TACs and moratoria, declines in landings of queen conch have also been attributed to various factors including:

1. Biological characteristics of queen conch.
 - i. Queen conch exhibit density-dependent breeding with source and sink dynamics. Therefore, heavy fishing of upstream populations could reduce the amount of larvae arriving to the downstream areas and affect recruitment.
 - ii. Population connectivity where gene flow over the spatial scale of the entire Caribbean basin is constrained by oceanic distance, which may impede the natural recovery of overfished populations.
2. Human impacts.
 - i. Destruction and sedimentation of critical conch habitats, which may have resulted in a permanent reduced carrying capacity for the species.
 - ii. Eutrophication and poor water quality which can also impact conch at the larvae stage by inducing metamorphosis before they are competent to undergo this process and settle.
 - iii. Poor fisheries management practices.
 - iv. Improvements in fishing technology and the ability to use SCUBA gear which has allowed the exploration of deeper habitats that were once unexploited and led to an increased fishing capacity.
 - v. Illegal fishing and trade.
3. Arrival of high quantities of Sargassum causing eutrophication.
4. Increased sea surface temperature and ocean acidification which result in lower calcification rates and thinner shells in queen conch.
5. Environmental phenomena such as currents, which affect quality and quantity of food during the critical larval period and could play a role in population size.
6. Hurricanes causing habitat loss.
7. Diseases and parasites.

The combined effects of all these threats and others can lead to the severe decline of conch populations if adequate management measures are not implemented. It is therefore essential to have information regarding the status of conch stocks in different countries, as well as their management needs. This information will be crucial to improve our understanding about the resource and to minimize the threats to which conch populations are currently exposed.

References

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The CRFM is an inter-governmental organization whose mission is to “Promote and facilitate the responsible utilization of the region’s fisheries and other aquatic resources for the economic and social benefits of the current and future population of the region”. The CRFM consists of three bodies – the Ministerial Council, the Caribbean Fisheries Forum and the CRFM Secretariat. CRFM members are Anguilla, Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago and the Turks and Caicos Islands.

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