CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Thirty-first meeting of the Animals Committee
Geneva (Switzerland), 13-17 July 2020

Species specific matters

QUEEN CONCH (*STROMBUS GIGAS*)

1. This document has been prepared by the Secretariat.

2. At its 18th meeting (CoP18, Geneva, 2019), the Conference of the Parties adopted Decisions 18.275 to 18.280 on *Queen conch* (Strombus gigas), which are presented in Annex 1 of this document. The Secretariat provides below a brief report on the implementation of those Decisions that are of most relevance to the Animals Committee.

Implementation of Decision 18.276

3. Concerning Decision 18.276, no request has been received from any range State of *S. gigas* for the Animals Committee to provide advice regarding the making of non-detriment findings (NDFs) for trade, or on any other technical matters. However, the Scientific, Statistical and Technical Advisory Sub-group (SSTAG) of the working group on queen conch (QCWG), which is composed of the Caribbean Fishery Management Council (CFMC), the Central American Fisheries and Aquaculture Organization (OSPESCA), the Western Central Atlantic Fishery Commission (WECAFC), the Caribbean Regional Fisheries Mechanism (CRFM) and CITES, has been working on the development of simplified guidance for making NDFs. One subgroup of experts is working on producing a preliminary flow diagram to provide countries with simplified recommendations on how to make their NDFs, and another sub-group will work on defining sustainability indicators. This may incorporate additional quantitative indicators, and revisit or complement the ones already adopted at the second meeting of the QCWG. The Animals Committee may be invited to review this revised guidance in due course. The Secretariat notes that the guidance could serve as an important case study for the NDF technical workshop envisaged under Decision 18.132.

Implementation of Decision 18.278

4. Concerning Decision 18.278, the Secretariat has continued to collaborate closely with the Food and Agriculture Organization (FAO) and the CFMC/OSPESCA/WECAFC/CRFM/CITES working group on queen conch (QCWG), which had its fourth meeting on 16-17 December 2019. The SSTAG had its second meeting on 25-26 November 2019. The CITES Secretariat participated remotely in both meetings.

5. In addition to the development of new guidance on the making of NDFs for trade in queen conch, as mentioned in paragraph 3 above, the second meeting of the SSTAG discussed the following:

   a) ways to improve the understanding of queen conch conversion factors for different processing levels (e.g. clean, semi-clean, clean/fillet) to determine the number of individual conches harvested;

   b) ways to have comparable data on queen conch conversion factors between countries and databases, including the CITES trade database;

   c) queen conch survey methodologies and protocols;

d) queen conch stock assessments;

e) identification of knowledge gaps;

f) socioeconomic aspects of queen conch fisheries; and

g) research priorities.

The final report (in English only), with recommendations from the SSTAG workshop, is found in Annex 2 to this document. The SSTAG is also considering the possible merits of developing a draft resolution on queen conch for consideration at the 19th meeting of the Conference of the Parties.

6. With regards to paragraphs a) and b) of Decision 18.278, the Secretariat has started discussions with donors about possible funding for this work. As indicated in Notification to the Parties No. 2020/032, it is estimated that implementation of Decision 18.278 would cost up to USD 330,000, broken down as follows: assistance to Parties USD 200,000; enforcement support USD 100,000; and collaboration with partners and range States USD 30,000. In this regard, donor Parties and stakeholders are invited to contribute the requisite financial support.

Additional information

7. The Secretariat notes that the United Nations Conference on Trade and Development (UNCTAD) and the Organisation of Eastern Caribbean States (OECS) have submitted a project proposal entitled "*Seizing the trade and business potential of Blue BioTrade products for promoting sustainable livelihoods and conservation of marine biodiversity in selected Organisation of Eastern Caribbean States (OECS) Countries*" that will support the main queen conch producing countries of OECS through UNCTAD's BlueBioTrade programme.

8. UNCTAD defines BioTrade as *"the activities of collection/production, transformation and commercialization of goods and services derived from native biodiversity under criteria of environmental, social and economic sustainability."* The concept of "Blue BioTrade" focuses on marine-based products and services, and was launched by UNCTAD, the Andean Development Corporation (CAF) and the International Ocean Institute (IOI) at the United Nations Ocean Conference in 2017. The Blue BioTrade approach involves working across multiple levels of the value chain to develop sustainable livelihoods, adopt an ecosystem-based management approach, and foster swift adaptation to dynamic markets and changing ecological conditions. The overall objective of the project mentioned in paragraph 7 above is to empower small-scale coastal producers from OECS member states to produce and trade queen conch products in domestic, regional and international markets under the Blue BioTrade environmental, social and economic sustainability criteria, including CITES provisions concerning international trade in the species.

9. In line with the call in Decision 18.278 to collaborate with relevant international organizations, the Secretariat has worked closely with OECS and UNCTAD to incorporate CITES CoP18 Decisions on *Queen Conch* (Strombus gigas) and their implementation into the project proposal "*Seizing the trade and business potential of Blue BioTrade products for promoting sustainable livelihoods and conservation of marine biodiversity in selected Organisation of Eastern Caribbean States (OECS) Countries*", and will act in a technical advisory capacity should this project proposal be successful.

Recommendations

10. The Animals Committee is invited to take note of the information contained in this document.

Decisions on *Queen conch* (Strombus gigas) adopted at
the 18th meeting of the Conference of the Parties (CoP18)

18.275 Directed to Parties

The range States of *Strombus gigas* are encouraged to:

a) collaborate to implement the Regional Queen Conch Fisheries Management and Conservation Plan, and develop national Queen Conch Fisheries Management and Conservation Plans, as appropriate;

b) continue to collect data on weight of *S. gigas* by processing grade in order to update and improve the regional conversion factors, and establish or update national conversion factors, taking into account the spatial variability and characteristics of the species;

c) collaborate in developing and implementing joint research programmes at the sub- regional or regional level to support the making of non-detriment findings that take into account all fishing mortality, promote relevant research and capacity-building activities through regional fisheries management entities and mobilize financial resources for data collection;

d) promote and collaborate in developing and implementing public education and awareness programmes regarding the conservation and sustainable use of *S. gigas*;

e) continue to collaborate in exploring ways to enhance the traceability of specimens of *S. gigas* in international trade, including, but not limited to, catch certificates, labelling systems and the application of genetic techniques, and consider sharing relevant experiences with the Secretariat, Parties and the Standing Committee, as appropriate, in the context of discussions on traceability systems for trade in CITES-listed species;

f) collaborate on combatting illegal, unreported and unregulated (IUU) fishing activity;

g) make available to the Standing Committee, through the Secretariat, information concerning illegal trade in queen conch, including surveillance and enforcement activities, as appropriate; and

h) provide information to the Secretariat on the implementation of paragraphs a) to f) of this Decision to allow it to report at the 19th meeting of the Conference of the Parties, in accordance with Decision 18.280, as appropriate.

18.276 Directed to the Animals Committee

If requested by range States of *S. gigas* or the working group on queen conch composed of the Caribbean Fishery Management Council (CFMC), the Central American Fisheries and Aquaculture Organization (OSPESCA), the Western Central Atlantic Fishery Commission (WECAFC), the Caribbean Regional Fisheries Mechanism (CRFM) and CITES, the Animals Committee shall provide advice regarding the making of non-detriment findings for trade, and on any other technical matters.

18.277 Directed to the Standing Committee

On the basis of reporting by the Secretariat in compliance with Decision 18.275, paragraphs e) and g), the Standing Committee shall review traceability, especially for meat, and enforcement issues concerning international trade in queen conch and make recommendations as appropriate.

18.278 Directed to the Secretariat

The Secretariat shall continue to collaborate with the Food and Agriculture Organization of the United Nations (FAO), the CFMC/OSPESCA/WECAFC/CRFM/CITES working group on queen conch, WECAFC and other relevant international organizations, and, subject to external funding:

a) provide assistance to range States of *S. gigas* in order to enhance the capacity of their CITES Management and Scientific Authorities, fisheries authorities and other stakeholders to implement the Regional Queen Conch Fisheries Management and Conservation Plan and national management plans and make scientifically robust non-detriment findings; and

b) provide assistance to range States of *S. gigas* on relevant enforcement issues and report new developments in this regard to the Standing Committee, as appropriate.

18.279 Directed to the Secretariat

The Secretariat shall monitor the development of traceability systems for queen conch and report relevant developments to the Standing Committee, as appropriate.

18.280 Directed to the Secretariat

The Secretariat shall collate the information provided in accordance with Decision 18.275, paragraph h), and report on the progress in the implementation of these Decisions at the 19th meeting of the Conference of the Parties.

Queen Conch Working Group (QCWG) CFMC/OSPESCA/WECAFC/CRFM/CITES
SCIENTIFIC, STATISTICAL AND TECHNICAL ADVISORY GROUP (QC/SSTAG)

Second Workshop
November 25-26, 2019, Hotel Aloft, Miami, Florida

Workshop Report

Introduction

This document constitutes the final report of the second workshop of the Queen Conch Statistical, Scientific and Technical Advisory Group (QC/SSTAG) created in response to the implementation of the QC Regional Fisheries and Conservation Management Plan as agreed in the third meeting of the CFMC/OSPESCA/WECAFC/CRFM/CITES Working Group on Queen Conch (QC).

The QC/SSTAG first met in Miami, 23-24 April 2019, thanks to the financial support received from the Caribbean Fisheries Management Council (CFMC) and FAO/WECAFC (80% and 20%, respectively), and it is being coordinated by Martha Prada. Around 10 experts were initially appointed by the QC working Group, but accordingly with their internal protocol, its composition is flexible enough to accommodate additional experts depending on the tasked objectives. Recommendations from its first meeting were presented at the WECAF 17 session of the commission, held in Miami 15-18 July 2019.

The second QC/SSTAG workshop took place also in Miami, 25-26 November 2019 and had a similar financial than the first one. This workshop allowed for active discussions and analysis to attend the objectives received from the QC Working Group, as follows:

a) Improve scientific guidance on regional conversion factors,

b) Provide initial considerations about the basic information needed for generation of queen conch NDF determination,

c) Identify priority research at the regional level.

In this way the workshop agenda (ANNEX 1) promoted discussions (ANNEX 2) and generated specific recommendations needed to facilitate the implementation of actions contemplated in the QC Regional Fisheries and Conservation Plan.

While face to face meetings of experts can be and are complemented with online communications, it is recognized that there is a need for securing additional funding, not only to maintain the group actively working, but also to develop supporting advice on other management actions and to conduct the priority research being identified.

Workshop participants

The second QC/SSTAG convened a total of 12 experts, with three of them participating using online communication (Figure 1).

No.	Name	Last name	Country	Organization	email
1	Nelson	Ehrhardt	US-Miami	Consultant	nehrhardt@rsmas.miami.edu
2	Alex	Tewfik	Belize	Consultant	tewfikalexander@gmail.com
3	Elizabeth	Babcock	US-Miami	Univ. of Miami	ebabcock@rsmas.miami.edu
4	Mauro	Gongora	Belize	Fisheries Department	megongora@hotmail.com
5	Richard	Appeldoorn	Puerto Rico	Consultant	richard.appeldoorn@upr.edu

6	Manoj	Shivlanim	US-Miami	Consultant	shivlanim@bellsouth.net
7	Diana	Beltran	US-Rhode Island	Genetic researcher	dbeltran@uri.edu
8	Monica	Barone	Roma	FAO- FIAS	Monica.Barone@fao.org
9*	Daniel	Kachelriess	Switzerland	CITES	daniel.kachelriess@un.org
10	Maren	Headley	Barbados	CRFM	maren.headley@crfm.int
11*	Martha	Prada	Puerto Rico	CFMC-coordinator	pradamc@gmail.com
12*	Manuel	Perez	Nicaragua	OSPESCA	maper59@gmail.com
13	Natalia	Perdomo	Puerto Rico	CFMC-logistical support	nataliaperdomo_cfmc@yahoo.com

* = Online participation

Figure 1. Participants of the second meeting the QC/SSTAG held in Miami, 25-26 November 2019.

Updates from WECAFC 17 and CFMC 10th regular meeting (Martha Prada)

After welcoming participants, Martha Prada communicated to the group that recommendations generated during this second expert encounter will be presented at the fourth meeting of the QC Working Group, to be held in San Juan, 15-16 December 2019, and so encourage the group to engage in fruitful discussions and generate specific technical recommendations.

She reported that the main four recommendations on Conversion Factors (CF) generated during the first meeting of the QC/SSTAG were presented at the WECAFC 17 meeting, which took place 15-18 July 2019, in Miami. Those recommendations tackled the need for better country reports on their annual landings using proper CF that would allow back calculations of the animal weight, without the shell (dirty meat), for the various processing states, and the description of how they define as each processing grade used in trade. In addition, data reported also need to be presented in a way that the number of individuals harvested can be determined, in order to support stock assessments.

During this meeting, the Commission also recommended that the QC/SSTAG address complementarily issues in the queen conch fisheries, such as impacts from climate change, studies on the marine pollution, and inclusion of more information on socio-economic aspects, all consistent with an ecosystem approach to fisheries.

The work done by the QC/SSTAG was also presented at the 166th regular CFMC meeting, held in St. Croix, 20-21 August 2019. Council members did not have any additional comments.

Updates from CITES CoP18 decisions on Queen Conch and some other relevant developments (Daniel Kachelriess)

The group was informed that the CITES CoP18 (Geneva, 17-28 August 2019) adopted a new set of decisions on Queen Conch, that took into account the revisions made by the QC/SSTAG at its first meeting as presented by Mauro Gongora. These are Decisions 18.275-18.280 and can be found in the CITES Web page (file:///D:/Data/CFMC/2%20expert%20meeting/E-CoP18-085.pdf).

The decisions included an instruction to the CITES Secretariat to continue its collaboration with FAO and the members of the QCWG, including, subject to external funding, support to range States in implementing the Regional Queen Conch Management Plan, in particular making Non-Detriment Findings (NDF), and provide assistance to range States on relevant enforcement issues.

CITES CoP18 also agreed on a broad work program on Non-detriment findings that one or several workshops to improve guidance on NDFs will be organized between CoP18 and Cop19.

The QC/SSTAG should discuss whether or not to recommend to the QCWG the development of a resolution under CITES on queen conch.

Improving understanding of queen conch conversion factors by reanalyzing existing data (Nelson Ehrhardt and Manuel Perez)

Regarding queen conch Conversion Factors from clean meat landing categories, in 2019 CFMC funded a consultancy aimed to: a) statistically review existing data used in CF estimations for live weight and assess adequacy of the data for estimating new CF ("dirty" meat weight from different processing grades use in trade); b) examine the effects of "dirty weight" on % clean meat weights to elucidate the statistical validity of using such data under potential QC morphometric effects; c) to provide new CF to "dirty weight" from various % processing weights reported by the countries; and d) to estimate a regional average CF for the purpose of reconstructing FAO fishery statistics from average "dirty" weight statistics to live weight (i.e. dirty weight + shell weight). The QC/SSTAG noted the final report submitted by the consultants (Nelson Ehrhardt and Manuel Perez) and accepted the results presented and discussed at this meeting.

Covariance and regression comparisons analyzed phenotype (morphometric measures) between various processing levels (i.e. 50% clean meat, 85% clean meat, 100% clean meat) and dirty weight, as well as live weight (animal with the shell) and dirty weight. Variations in the slope of this relationship characterized differences in morphometric growth, while differences in the intercept portrayed the degree of weight reduction due to processing.

CF were then estimated taking into consideration these regressions of the different % clean meat and the average dirty meat category, as follows:

50% clean to dirty weight	CF 95% Confidence interval		
Country	Average CF	Lower	Upper
Martinique	1.53	1.33	1.80
Bahamas	2.05	1.78	2.43
Nicaragua	1.86	1.78	1.96
Dominican Republic	1.69	N.A.	N.A.

85% clean to dirty weight	CF 95% Confidence interval		
Country	Average CF	Lower	Upper
Barbados	1.86	1.42	2.69
Honduras	2.41	2.17	2.73
Dominican Republic	2.11	N.A.	N.A.

100% clean to dirty weight	CF 95% Confidence interval		
Country	Average CF	Lower	Upper
Honduras	2.73	2.46	3.05
Bahamas	2.76	2.37	3.30
Nicaragua	3.06	2.84	3.31
Martinique	2.66	2.30	3.15
Dominican Republic	3.19	N.A.	N.A.

Dirty weight to whole weight	CF 95% Confidence interval		
Country	Average CF	Lower	Upper
Nicaragua	2.73	2.46	3.05
Honduras	2.76	2.37	3.30
The Bahamas	3.06	2.84	3.31
Average	5.36	4.69	6.26
Dominican Republic	3.89	Samples with sub-adults only	

The ANCOVA results showed that stocks in Nicaragua, Honduras, the Bahamas, Barbados, and Martinique have statistically similar slopes, implying that linear regressions fitted to dirty weight on shell weight are parallel lines. To the contrary, the large dispersion of dirty weight about regression on live weight generated a low degree of association between the variables, which is indicative that queen conch shell weight is not a good predictor of flesh weight. Therefore, differences in dirty weight-to-whole weight suggest an average regional CF at the live weight level may be lacking precision regarding reconstruction of total catch in live weight for FAO landing statistical purposes. In depth results from this work can be obtained from the CFMC and FAO/WECAFC Secretariat. For the purposes of CITES tracking of harvest in the context of export permits and associated country quotas for long-term sustainability, CF from dirty (uncleaned, soft-tissue) to the most common processed forms of conch meats (i.e. 65, 85, 100% clean) are the most important. Such conversions are also useful to associate total abundance and biomass from surveys to the recommended 8%, or less, harvest levels. Finally, CF may also be useful in determining whether mean meat weights used in various production models are reasonable.

Data from two important QC producing countries, Mexico and Belize, were not validated, and thus not utilized in the analysis. For that, Alex Tewfik mentioned that in a recent research project conducted on Glovers Reef, Belize, information for around 500 individuals could be used for this analysis, and so he offered to help in getting access to this dataset. In addition, Mauro Gongora, from Belize Fisheries Department, mentioned they will have additional data collected in 2019, that can be also utilized for this purpose. On the other hand, data received from the Dominican Republic, contained only small individuals (juveniles), and the sample size was also small, thus while illustrative, it was recommended that to be comparable with other countries, larger individuals need to be collected. It was not possible to have access to raw data collected from Antigua and Barbuda[1].

[1] *used in the published work of Horsford et al. (2011): The Morphology of the Queen Conch (Strombus gigas) from the Antigua and Barbuda Shelf – Implications for Fisheries Management. Proceedings of the 64th Gulf and Caribbean Fisheries Institute October 31 - November 5, 2011, Puerto Morelos, Mexico.*

The group discussed that variability in CF is going to be related to the sample size, size range, and sex information and the habitat where the animal was collected, data that is not regularly collected when taking field information. They mentioned also the limitations resulting from collecting data from one or two locations versus from several places, which can better characterize a country's variability. To the contrary, available data contained very little information on the locations from where samples were collected. In cases where data came from pre-processed conchs (usually in the industrial fishery) the possibility to introduce noise in the statistical analysis is higher.

QC/SSTAG Recommendations:

1. The new CF for estimating dirty weight from % clean meat categories have to be reported by countries using CF estimated at country level, and it is recommended that countries use this new CF to report landings data as dirty weight. It is also recommended that countries use the specific CF value or the average for countries that do not have this CF.

2. It is recommended that countries that still do not have CF take the appropriate data and submitted these to the QC/SSTAG for the evaluation of the methodology and for the CF estimation.

3. CF should be re-assessed periodically. An elapsed time between 4 to 5 years is recommended between CF re-assessments, giving attention to fishery expansions that may increase rapidly and effecting the size structures in the stocks. Such data collections could also be useful in providing samples for additional studies, such as genetic connectivity or the use of depletion models based on shell weights.

4. Sample sizes for CF estimation should be between 300 and 400 individuals. Samples should contain the whole range of sizes observed in the areas fished, or at least observed in the landings. Additional information on location is needed, and information on sex and habitat information will be useful. Technical guidance for collecting data on CF can be included in the updating of the existing manual for queen conch surveys.

Conclusion and recommendations to the QC Working Group. FAO perspectives and additional support. Recommendations for the QC Working Group (Monica Barone).

From FAO's perspective, it is essential to have QC landings data expressed on live-weight to allow comparison among/within countries and obtain consistent studies on national and regional trends. When submitting annual landings to FAO, countries and territories are being requested to report as soon as possible complete with their processing grade(s), or provide the whole historical data series on queen conch catch in live weight according either to their national or the regionally agreed conversion factors.

In this sense, there is a need to determine how to revise the FAO Statistics once new recommended CF are applied, and how to reduce uncertainty of terminology, and methodologies of processing grades, given the country variability or lack of information either on CF and the processing grade utilized.

The new CF from dirty weight to live weight, implies that currently each country needs to solve the conversion from different processing grades to dirty weight. The average/regional CF (5.36) is currently estimated and available only for the CF from dirty weight to live weight. Moreover, there is more interest, in view to obtain a stand and evaluation of the catch for stock assessment purposes, to promote the CF estimated at National level.

She reported on the main implications on the FAO statistics in the application of the new CF. She presented the list of countries who reported official capture production data to FAO, divided in three groups, depending on the status/declaration of the CF: Countries declaring both the processing grade and the National CF, which were 12 for 2017 statistics, accounting for the 66% of the total reported capture production of QC; Countries declaring processing grade and applying the regionally agreed CF. In 2017, the nine countries being part of this group accounted for 26% of the total reported capture production of QC. The third group of countries is represented by nine countries not declaring neither CF nor processing grades, and accounting for 8 percent of the total capture production of QC reported to FAO. FAO is transparent in reporting data and CF applied is made available as metadata in the FishStatJ software.

There is a need to determine how to revise the FAO Statistics once new recommended CF are applied, and how to reduce uncertainty of terminology, and methodologies of processing grades, given the country variability or lack of information either on CF or the processing grade utilized.

In addition to all the difficulties mentioned in existing FAO database, Alex Tewfik mentioned that this information also contains huge gaps, because countries are not reporting local conch consumption, which for some countries can be as high as 60% of the total landings. This is a critical issue that need to be addressed.

Monica Barone also talked about the need for having indicators demonstrating the implementation of the QC regional plan of action, (e.g. percentage of countries declaring CF and detailed information on processing grade; countries having management measures in place for QG; etc.). Maren Hedley then mentioned that through the CMLE+ project and its Strategic Action Plan there are around four indicators in strategy 4B for enhance governance in the queen conch fisheries that can be look at, and so shared a document containing this information with the group.

Another aspect to consider is that under CITES, Parties need to report on their annual international trade which is recorded in the CITES trade database. Within that database, there is no field allocated for the reporting of conversion factors and it is unlikely that such a field could be created easily, meaning that information on conversion factors submitted by CITES Parties in their annual reports would currently not be reflected. Reflecting on the goal to have comparable data between countries and databases, the group discussed that one solution may be to ask UNEP-WCMC, the service provider that maintains the CITES trade database, to apply the conversion factors reported by Parties to convert the trade data to a commonly agreed processing grade before entering the data into the trade database. Daniel Kachelriess confirmed that this would be a possibility and that there are precedents for such an instruction. Due to the fact that the definition of 100% clean queen conch meat varies among the countries, the group discussed that a possible standard for CITES export transactions could be the dirty weight. This would require that Parties in their annual CITES trade report provide the relevant conversion factor for their exports to be converted from the various processing grades to dirty weight. In summary, the group discussed that countries should be requested to provide their CITES trade data on QC in dirty weight, or provide conversion factors that allow calculation into dirty weight, and a CF to live weight (or using regional CF only from dirty to live weight). The group discussed that this type of instruction could be included in a QC resolution under CITES.

QC/SSTAG Recommendations:

1. Further investigate differences in the terminology of conversion factors across countries to validate the national and regional CF for the various processing grades, helping to understand and improve the quality of the FAO production and CITES trade databases.

2. Continue the discussion on CF and the need to use new standards (i.e., dirty meat weight), identifying which criteria would be applied in the future and the importance of countries in obtaining good national CF, in response to the species's variability in growth parameters and processing grades across its distribution.

Regional training workshop on queen conch population assessment in the Caribbean (Elizabeth Babcock)

She presented results from the training on queen conch population assessments workshop held in Belize 30 July – 1 August 2019, with financial support of the WECAFC Secretariat. Representatives from countries conducting surveys were invited, including Jamaica, Nicaragua, Colombia, The Bahamas, Honduras and Belize (Figure 2).

The workshop aimed to analyze field protocols for QC density surveys and how the data is used to determine nations' annual quotas. They discussed how to harmonize field and data analysis protocols, so that some recommendation can be applied across the Caribbean. In addition, they explored the potential use of fishery dependent data to develop regional indices of QC abundance and patterns so that existing data can be better integrated into estimation of Total Allowable Catch (TAC) and NDF determinations.

Figure 2. Group picture of workshop on queen conch population assessments workshop held in Belize, 2019.

Surveys vary in the depth of surveyed sites, the length of the transects, and other details considered in the survey design. In Jamaica (Pedro Bank) a standard stratified random design is used to estimate total biomass; the potential quota is then calculated with an 8% control rule, then reduced by precautionary rules to accommodate uncertainty. Belize captures mostly sub-adults in relative shallow waters; they conduct surveys to estimate total fishable biomass and apply an equilibrium production model method (assuming equilibrium and requiring an accurate estimate of natural mortality) to estimate maximum sustainable yield (MSY) which is used to set their annual quotas. In Nicaragua, the fishery is in deep water and the survey is done on the fishing grounds with a stratified random design. The survey is not the only source of information to determine their quota. In Colombia, the fishery is small and artisanal, and they no longer export QC; however, the TAC is set based on a control rule. The Bahamas has a mostly shallow water fishery covering many fishing grounds over a large area and the survey samples different areas every year. Thus, the survey is not used to set quotas. In Honduras, the fishery is also comprised of adults in deep water, and surveys are not used to estimate export quotas, which are the same every year (not adjusted for the survey estimate of biomass).

The group concluded that standardizing methods in a short meeting was not achievable, and perhaps there is more opportunity for standardization in the way surveys are reported. For instance, countries should report the total area surveyed, and how the surveyed area was defined (e.g. conch spawning areas, regions of potential conch habitat, etc.) and when the survey is conducted with respect to reproductive seasons. Sample size tends to be small so it is important to calculate the power and necessary sample size to calculate biomasses with the necessary precision to inform quotas. Some questions to consider in the sampling design were analyzed, including changing in the protocols to be more effective when resources are limited.

The group discussed the use of both fishery-independent and fishery-dependent data for setting quotas. They noted that different countries may need to use different methods depending on, for example, how complete their catch data sets are, whether IUU fishing is a problem, and what kinds of data are available. Whatever methods are used to assess population status and set quotas, it is important that countries report the proportion of biomass that is harvested every year (i.e. harvest rate = catch/biomass) to make sure that the harvest rate is below the recommended 8% limit by the QC Working Group in 2012.

For setting quotas many data limited methods are available (more than 120 methods are available, for example in the DLM tools R library by Carruthers et al. 2018[2]) and some of these may be viable for management of QC in some countries. These methods are powerful, but they have been designed for fish with different growth and some may not work for conch having 2-phase growth. The inclusion of the Allee effects would require extra work to be integrated into these models. Management strategy evaluations should be used to test these methods before applying them.

The use of non-equilibrium surplus production models fitted to time series of abundance is an alternative for assessment and setting quotas, which requires complete annual catch data along with an index of abundance.

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[2] *Carruthers, T.R. & A.R. Hordyk. 2018. The Data-Limited Methods Toolkit (DLMtool): An R package for informing management of data-limited populations. Methods in Ecology and Evolution 9:2388-2395.*

This may be viable in some countries, especially if information on life history and conch habitat were used to improve the estimates of the population growth rate (r) and carrying capacity (K) parameters. On the other hand, the length-based methods are not recommended for this species with 2-phase growth (use across the fishery, it would assume a low degree of habitat-based growth variability) with the exception of those areas where sub-adults are targeted. Perhaps weight converted catch curves may be effective (See Valle and Ehrhardt QC manual).

In depth information on the Belize City meeting is available in the technical report along with additional tutorials and other documentation.

The group discussed whether stock assessments are necessary for making an NDF. It seems that if a sustainable fishery management plan is in place, this could be the basis for NDF. In this sense, less data intensive methods may also be sufficient for an NDF. Many assessment methods depend on adequate catch data, which may not be available given the large amount of IUU fishing for QC, and domestic use of QC in some countries. Statistical good design population surveys can be a sound basis for tracking abundance and setting quotas, even in the absence of adequate catch data, but they are expensive. There is a need to recover the cost of surveys from the fisheries. Indicator-based methods are useful because they start with current conditions and do not require historical data.

Given the uncertainty in whether QC occurring below fishing depths are a source of recruitment into the fisheries, there is a need to survey deep water areas in some countries.

Surveying in deeper areas is challenging, and available methods may vary within certain depth ranges. Using Nitrox, 30-40 m is still within the limits of diving, but it is not recommended to dive deeper than that. In deeper waters, ROVs may be needed, although video data may not be as accurate as diver counts. In shallow waters, millions of empty shells are left behind from the fisheries, and it may be difficult to differentiate shells from life conchs by using remote sensing technologies. This may be less of problem in waters below fishing depths or in sandy habitats where within six months dead shells will probably be covered by sand, according to Richard Appeldoorn's experience in Puerto Rico. Live conch may also avoid areas with large amounts of empty shells at least temporarily.

Destruction of juvenile-habitat by deposition of empty shells in the search for queen conch pearls is another phenomenon that needs to be considered. In Belize for instance, a significant number of empty legal size conch shells (sub-adults) are found in nursery grounds, although recruitment in the past 19 years is consistent.

QC/SSTAG Recommendations

1. Promote harmonization in reporting on the fraction harvested and conch population abundance indices from QC surveys, thus facilitating the determination of the national stock status.

2. Develop guidelines for conch density survey protocols that could then be standardized across the region (with priority given to those countries already conducting surveys), that include information on the habitat type, depth, size/age classes.

3. Filling data gaps including the identification of sink and source locations, spawning grounds, and a genetic study to determine connectivity, and traceability should be a priority.

4. Evaluating the presence and reliability of existing data by country. Perhaps a proposal, at the subregional level, can be developed. FishPath (fishpath.org) is a useful tool for evaluating data availability, capacity and fishery characteristics to determine which assessment and management strategies are feasible.

5. Habitat and environmental conditions need to be considered in surveys and assessment. The distribution of density is important and may change with climate change. Providing maps that visualize spatial distributions of QC density across each nation's fishing grounds over time is important to understand changes in population dynamics and fisheries.

6. Private sector (industry) can generate transparent mechanisms for conducting QC surveys. In addition, collaboration with other sectors is essential for more efficient way to perform field work.

Proposed manual updates and strategies for improvement methods to estimate annual extraction quota. Ad-hoc stock assessment expert group (Nelson Ehrhardt and Elizabeth Babcock).

The available stock assessment manual developed by Ehrhardt and Valle in 2008 and published by CFMC needs to be updated to integrate all the new agreements and requirements, in fulfilling the objectives as CITES Appendix II listed species. The establishment of harvest quota needs to integrate the international trade (export) and the local consumption, and there is a need to consider that not all Caribbean countries and Overseas Territories are Parties to this Convention. CITES specify that Parties are responsible for the enforcement of the species regulations, and so they must determine the export quotas that are not detrimental to the species based on what they consider an appropriate sustainability criterion. In this framework, that is important to be able to provide technical support to countries in properly determining their annual quotas, based on minimum sustainability criteria, for instance, the 56 ind/ha in spawning grounds, which may vary depending on the habitat type. The Review of Significant Trade is a process through which the CITES can review the national process and can also provide technical guidance to the Convention Parties.

Mauro Gongora mentioned that in Belize they use several indicators to determine how the conch population is performing, and they consider this adaptive management strategy based on past performance is functioning well. He mentioned that they are happy to adapt it with other criteria applicable sustainability criteria. The Group suggested a review of such indicators to seek validation and potential application of the Belize experience.

Estimation of conch density needs to be related to the extent of the fishing ground in the process of estimating the conch quota. There is a need to understand the real scale of population connectivity to determine the degree of local and regional dynamics. VMS data may provide interesting data to understand the extend and variations in fishing areas. Thematic habitat maps can help in understand these processes.

The group agreed that total annual quotas should be based on formally defined sustainability criteria, and recommend that such criteria be studied, assessed, and integrated to the non-detrimental catch estimation methods that should be included in the updated stock assessment manual. The QC Working Group already had adopted the recommendation of 100 individual conch per hectare on spawning grounds as a sustainability criterion. However, the update of this manual is a good opportunity to develop cost efficient guidance to countries facilitating implementation of better sustainability criteria in setting up their national and export quotas.

QC/SSTAG Recommendations:

1. Update methods in the existing queen conch stock assessment manual and address issues related to the establishment of sustainability criteria when defining production and export quotas (i.e., adult density, 8% or less of exploitable standing biomass).

2. Implement a stock assessment software that is as simple as possible to more effectively promote the use of the recommended methods.

3. Address online training regarding the stock assessment methods and quota estimation algorithms to reduce the cost of having broad participation of key fisheries officers across the Caribbean.

Proposal for studies on QC genetic connectivity (Diana Beltran)

Diana Beltrán described the work done in Puerto Rico using genome wide variation across four queen conch morphotypes identified by local fishermen. She found differences among morphotypes using Single-Nucleotide Polymorphism (SNP's) and test if phenotypic differences between conch morphs are associated with genomic variation. To better understand the quantitative differences among morphotypes, she measured lip thickness and shell length for each individual across 757 conchs. She found lip thickness differentiation among four morphotypes ($p = 2e\text{-}16$; $p < 0.05$). Similarly, shell length varied across morphotypes ($p = 2e\text{-}16$; $p < 0.05$), with the Flin phenotype being the smallest and most differentiated.

Flin individuals had significantly thinner lips and were the smallest (between 12-17 cm); their shell is thicker and heavier, less space between whorls, and they often have longer spines compared with the other three morphs. The Flin morphotype shares numerous characteristics with an identified phenotype in Mexico, Cuba, Turks and Caicos, and Bahamas called Samba. A few hypotheses related to the Samba phenotype include: 1) limited food, 2) habitat availability, or stressful conditions and 3) high fishing pressure.

To test if phenotypic and geographic variation is correlated with genetic segregation, Beltran used genome wide variation using 21,861 SNPs across 277 individuals. She found genetic differentiation among morphotypes as inferred from multivariate analysis such as: 1) Principal Component Analysis (PCA); 2) Discriminant Analysis of principal components (DAPC), 3) analysis of molecular variance (AMOVA) and 4) fixation indexes ($FST= 0.001$; $p= 0.001$). The SNPs data highlights the differentiation between Flin and non-Flin morphotypes. Dr. Beltran's

results were successful given the power of the test, which analyzed large portions of the individual's DNA. Unfortunately, results cannot be compared at the regional basis, because this is the only genetic analysis done using this technique. All others include the use of microsatellite variants, which cannot be compared across studies.

To identify the conch genetic connectivity across the Caribbean, a new project needs to be developed, which shall offer the opportunity to:

1) quantify connectivity patterns for neutral and adaptive SNPs (variants) for each morph across the Caribbean. An opportunity to test for the first time if genomic variation is segregated across the Caribbean.

2) test if phenotypic differences between morphs are associated with genome wide variation by identifying alleles correlated with morph variation.

3) test if variation in latitude correlates with variation in allele frequencies to understand if some alleles might be moving northward to colder environments as seawater warms.

4) test if genetic variation has changed in the last 200K years. Using these techniques, Dr. Beltran can estimate populations sizes through time and test if populations have contracted or expanded as a result of climatic variations associated with glacial cycles that have changed seawater temperatures and sea levels.

In addition to the main objectives, Dr. Beltran's genomic data will be publicly available and deposited at the NCBI and will provide the baseline data to design protocols to stablish the traceability of conchs from different Caribbean regions/islands to identify illegal trade.

To develop Dr. Beltrán's project, she requires access to samples throughout the Caribbean, and from each location at least 10-15 adult individuals per morph will be needed. Conch shells will be collected along with tissue samples. Conchs will be measured morphologically, and tissue samples processed to generate genomic libraries.

To accomplish her work, Dr. Beltrán has already secured some funding from the University of Rhode Island. URI will provide: a) Materials for tissue samples, preservation and storage, b) materials for DNA extraction (DNA extraction kits, plasticware and chemicals), c) use of laboratory equipment, library quality control through a tape-station, d) SNPs libraries or, whole genome low coverage genotyping (1x-2x), e) the cost for sequencing of ~ 500 conchs, along with bio-informatic computer and software, f) three months of salary for one laboratory technician to help Beltrán during library preparation, and g) one summer month of salary for a professional analyst to help Beltrán during data analysis. To match her funding from URI, she is requesting: 1) her salary as the principal investigator for 18 months, 2) a second month for a professional analyst and 3) the cost of collecting the samples. URI is open to explore additional collaboration with other partners in the region or elsewhere.

QC/SSTAG Recommendations:

1. The QC Working Group identified the genomic work with connectivity of the different morphs across the Caribbean as an example of the scientific gaps relative to manage and protect QC populations and how they will be affected by climate change. The QC Working Group encouraged the development of a proposal to better estimate costs and needs.

2. The QC/SSTAG recommended that the genetic work first focus on locations in which commercial fisheries that export QC operate in common, particularly the areas fished by Colombia, Jamaica, Honduras and Nicaragua, as this would also demonstrate the practicality of using genetics to determine small-scale population structure of interest to management and its practicality for traceability. Alternatively, additional funding could be found to increase the sample size in this area within her original proposal.

Revision and analysis of existing guidelines for making NDF for QC exports (Martha Prada)

In preparation for this discussion, Martha Prada prepared two flow chats, based on the Mexico diagrams presented at the Second QC Working Group. Mauro Gongora mentioned how Honduras, Nicaragua and Belize agreed to a sub-regional cooperation for developing guidance in the preparation of QC NDFs. Thus, the frame of this structure is very important for a NDF workshop being planned for early next year in Honduras and technical recommendations from this group would be highly appreciated.

Monica Barone commented that there are some repetitive topics in those charts, and they need to add space for addressing risk when information is not available, thus it was recommended to update the way the flow charts

are being presented. Manuel Perez also commented that countries need to be consulted in order to address what are their realities and resource limitation in obtaining the necessary data for performing good NDFs, and so it was recommended that this be discussed in the December meeting.

Daniel Kachelriess suggested to include the timeline for having final recommendations on the NDFs, and informed the working group that there will be one or more workshops on non-detriment findings organized between CITES CoP18 (2019) and CoP19 (2022) that would present opportunities to look at other NDFs for marine species and share experience and knowledge more broadly. An advance draft can be presented at the CITES Animals Committee and receive their guidance too.

During the discussion on the making of NDFs, several references were made to the original listing proposal for queen conch, and Daniel Kachelriess explained to the group in that context, that since queen conch was listed in 1992, the guidance on listing criteria in Resolution Conf. 9.24. (Rev. CoP17) had been revised by the Conference of the Parties, making the information in that original listing less relevant today. In addition to the biological criteria, trade criteria also need to be considered, and it was further explained that in CITES there are not automatic proposals for listing species, but only proposals received from Parties. The overarching objective is to ensure that trade is not detrimental to the survival of the species. Thus, criteria definition is essential, thus recommendations made in the past from experts and adopted at the second QC Working Group needs to be revisited.

QC/SSTAG Recommendations:

The group discussed more on how to proceed for the evaluation of the NDF procedure rather than on the concrete procedure, agreeing on the followings:

1) The diagram for the NDF should be evaluated step by step, aggregating the points that are referred to annual or longer considerations to distinguishing the routine procedures related to singular trade operations. Moreover, the application to national examples can help in testing the applicability of the proposed model. Mauro Gongora, Fisheries Department of Belize, offered to chair a subgroup for continuing the discussion for providing a revised draft version of the diagram by the next meeting of the QC WG planned in Puerto Rico from 18–19 December 2019. Other suggested members of this subgroup were Maren Headley and Martha Prada.

2) As the NDF starting point of the diagram refers to the determination of the annual quota and therefore of an export quota, and considering that a CITES “export permit shall only be granted when a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species”, the group considered fundamental to clarify the theoretical but fundamental definition of the QC fisheries sustainability, to guide in the allocation of the quota, which include definitions of what are healthy populations (all life history stages), sustainable levels of production and associated export quotas which account for considerable local consumption Appeldoorn. Richard Appeldoorn, Alex Tewfik and N. Ehrhardt were suggested to be part of this group.

Analysis of socioeconomic aspects in the QC fishery (Manoj Shivlani)

He made a comprehensive description of various socioeconomic topics in the QC fishery, with particular references to the Bahamas and Puerto Rico. He mentioned how this species is tied to the local communities in terms of income, livelihoods, trade, and identity, and how the current decline in QC stocks may demand different management strategies and information needs. Conch fishers are generally identified as small-scale fishers operating out of traditional and historical fishing communities, even when engaged in industrial activities in exporting countries or working in well-built processing plants, which may also serve small scale producers. Small-scale fishers participating in the production and trade are impacted by variations in the species’s abundance and demand. Prices can remain high based on supply conditions, due to the high demand from the tourism sector.

He presented some estimations about trip costs, where fuel represents the highest proportion. In addition, he talked about fishing vessel characteristics and described the diving operations consisting of hookah, Scuba, or free diving. However, due to a reduction in QC abundance, fishers have progressively shifted to dive in deeper waters and more frequently (additional bottom time is required to search and remove conch meat from the shell). Diving is also a serious problem for some communities, and it appears that decompression episodes did not dissuade fishers to dive, even with moderate disability.

Fishers are usually multispecies fishers, although habitat conditions do limit the number of species targeted, especially in relation to conch habitat. In places like Puerto Rico, hand-lines are often used as secondary gears on a trip or seasonal basis. Reports from Puerto Rico, described how Hurricane Maria in 2017 generated

extensive damage to sea grass, resulting in losses in landings, fewer trips, and deeper water dives (to 115-130 ft). In fact, price of conch meat in western PR increased from $6.50/pound to $9.00/pound from 2016 to 2018 due to supply disruption.

Fishers' perceptions concerning regulatory approaches vary. In some regions there is support for additional measures, while in in other regions fishers are completely against new measures. Concerns on regulations are due to uncertainty over how long expected benefits will take place, and what alternatives are available. Open access throughout most of the Caribbean leads to competition and increases IUU fishing concerns.

Socioeconomics strongly shape political will, so strong understanding of socio-ecological system, especially in terms of setting the socioeconomic incentives towards more sustainable harvest and management is needed. Without a better understanding of socioeconomics, management changes will be met with pushback. Education would help in this regard and the case of conchservation (https://bnt.bs/science/conchservation/) and Community Conch (http://www.communityconch.org/) in the Bahamas were mentioned.

The group analyzed the complex socio-economic structure in the industrial fisheries, like in the case of Honduras, where there are a lot of complaints about competition arising from having different seasons with lobster fishery in offshore fishing grounds; to deal with this situation, maybe a special management structure is needed. On the other hand, local consumption in many countries is significant and driven by foreign tourists, and so there is strong connection between fishers and restaurants. In another example, Mauro Gongora mentioned the difficulties in getting information on small quantities of conch used for family consumption because the product is usually not sold in small quantities; the minimum amount sold through the formal market is 5 pounds (the export unit). To increase transparency and traceability it was mentioned that there is a need to use proper terminology when determining what local consumption really is.

CITES is currently seeking case studies that demonstrate the value of sustainable use for livelihoods and other socio-economic aspects. Conch fisheries in Belize may a good example. This trade is dominated by exports, but it may be important to determine how important this fishery is for small scale fishers, which is in fact a topic of discussion right now, and is creating a big debate, and that is why more case studies are encouraged.

QC/SSTAG Recommendations:

1. Identify mechanisms (social, cultural, behavioral) that can be used to increase stakeholder engagement and support for the 3 pillars embedded in the regional plan (Technical & Statistics, Education & Outreach and Governance). The development of case studies with different characteristics, e.g., high vs low capacities, successful cases vs non-successful cases, are recommended to be prioritized.

2. Improve the data on socio-economics in this fishery, including aspects of local communities, local consumption and trade to be included in the quota setting. Continue the CRFM socio-economic data compilation.

3. For those non-exporting countries, the QC/SSTAG can provide technical recommendations in order to increase the sustainability of the fishery, taking into account different aspects related to the socio-economics of the QC fishery, food security, and local consumption among other topics.

4. Continue to improve sustainable conch fishing to maintain more stable production and benefits to local communities in the long term, considering aspects of conservation, captures and trade network.

5. The lack of safety diving in the QC and lobster fishery needs to be further addressed, with evaluations of the progress achieved from initiatives in place, to counter this health problem in local communities.

Research Priorities (Richard Appeldoorn)

The following recommendations are the QC/SSTAG consensus on research priorities and are in addition to the specific recommendations presented above within the specific issues analyzed during this meeting.

- There is a need for countries to report their annual conch landings along with their processing grades to be able to utilize the proper conversion factors. Efforts in developing new conversion factors may be null if landing statistics are not available.

- Survey protocols need to be developed in collaboration with experts on statistics and in light of what models will be used for analysis to ensure that the resulting data fit the model. Allocating sampling sites systematically is recommended to that thematic habitat maps can be generated. Future studies should

attempt to do a power analysis, so that number of sites and allocation among strata can be optimized and the abundance/biomass estimate will be more precise.

- For surveys in depths within 30-40 m, nitrox diving offers an effective approach. For deeper areas, camera-based (drop cameras, towed cameras, remote operated vehicles) surveys would be required. There are advantages and disadvantages of each method, and there was interest among the QC/SSTAG to explore these further.

- Review and provide proper guidance on compiling landings data (including both export and local consumption) and determine minimum data needs for stock assessment using fishery-dependent data. Emphasis was given to have countries provide reliable landings data, estimates of local consumption, and IUU fishing. The last two can be obtained by special surveys, including trip tickets, site and phone surveys, and weekly inspections.

- Update and summarize information on conch population dynamics, including growth, mortality, habitat quality, and develop a conch population dynamics simulation model suitable for use in management strategy evaluations. Results would provide the basis for conducting management strategy evaluations (MSEs) using the available Data Limited Models (DML) tools.

- Conduct specific research aimed to increase our understanding of spawning aggregations and reproduction success, including the effects of climate change. The QC/SSTAG emphasized the importance of maintaining spawning aggregations and reproductive success, yet the factors affecting these are poorly known and difficult to assess. Some information could come from fishery independent surveys, but this would again depend on the purpose and target of the surveys.

- Improvement of the regulations, enforcement strategies and assessment of countries capabilities is needed to improve stock management. QC/SSTAG recommended exploring the use of Fishpath to identify data availability and capacity, which could then be matched to potential assessment mechanisms. In addition, it is recommended that a gap analysis be conducted for the legal (=regulatory) framework of countries. This would require a review of each countries' framework and management plans.

- Increase knowledge and understanding of the queen conch value chain, in particular on conch value-added products (e.g., byproducts of conch meat processing and the use of the shells), to be able to track its trade. The trade in conch pearls is particularly valuable yet unknown. For example, fishers from Belize report that pearls are disproportionally found in small juveniles, which would incentivize fishing for juveniles, but it was also reported that pearls were found in the Honduras sampling, which was only of adults. It was noted that Megan Davis of Harbor Branch (Florida Atlantic University) has worked with culturing conch pearls and may be able to address issues of how long it takes for pearls to develop and in what size conch are they found. For CITES permits, it would be valuable to document that pearls were coming from licensed fishers.

ANNEX 1. QC/SSTAG Second Workshop Agenda

Day 1: November 25, 2019			
Time	**Topic**	**Leader**	**Detailed description**
09:00-09:45	Welcome and introduction, updates since first SST advisory group meeting	Richard Appeldoorn	Welcome and introduction
		Martha Prada	Updates from FAO SAG, WECAFC 17, and CFMC meetings
		Daniel Kachelriess (Skype)	Updates from CITES CoP18 decisions on Queen Conch and some other relevant developments
09:45-11:00	Progress on QC conversion factors and group discussion	Nelson Ehrhardt	Summary of consultancy report, strategy for getting additional data, recommendation for increase the use of conversion factors, need for new conversion factors.
11:00-11:15	Break		
11:15-12:30	Continuation of QC conversion factors.	Nelson Ehrhardt & Monica Barone	Conclusion and recommendations to the QC Working Group. FAO perspectives and additional support. Recommendations for the QC Working Group.
12:30-13:45	Lunch		
13:45-15:45	Group analysis of results from training workshop on QC surveys and determination of QC population status	Elizabeth Babcock	Summary of training workshop, group discussion on results and need for additional considerations. Recommendations for sampling deeper environments (30-40 m in depth) and safety protocols. Recommendations for the QC Working Group.
15:45-16:00	Break		
16:00-16:45	CFMC QC manual updates & how to estimate quotas	Elizabeth Babcock & Nelson Ehrhardt	Proposed manual updates and strategies for improvement methods to estimate annual extraction quota. Ad-hoc stock assessment expert group
16:45-17:15	Proposal for studies on QC genetic connectivity	Diana Beltran	Description of sampling needs, support provided by Univ. Rohde Island, need for additional support. Strategies for feasible progress. Recommendations for the QC Working Group.
Day 2: November 26, 2019			
09:00-10:45	Revision and analysis of existing guidelines for making NDF for QC exports	Richard Appeldoorn & Martha Prada	Comments on simplified NDF scheme, need for documentation on guidelines to be provided, CITES support. Plans and future work. Recommendations for the Working Group.
10:45-11:00	Break		
11:00-12:00	Analysis of socioeconomic aspects in the QC fishery	Manoj Shivlanim	Summary of the specific need of information, what are the priorities, sources of data, main challenges and risks.
12:00-13:30	Lunch		
13:30-14:00	Continuation of analysis of socio-economic aspects in the QC fishery	Manoj Shivlanim	Recommendation for the working group
14:00-15:45	Revision of the research agenda for establishment priorities	Richard Appeldoorn	Revisited list of identified research needs, analysis for identification of priorities needs. Agreements and potential partnerships.
15:45-16:00	Break		
16:00-16:45	Strategies for drafting a GEF proposal for getting additional funding	Group discussion lead by Maren Headley	Agreement on objectives and potential outputs for structuring a regional proposal for the improvement of the QC fisheries and conservation management.
16:45-17:00	The way forward	Maren Headley	Final recommendations and future steps

ANNEX 2. Workshop picture collection