

**4th (Virtual) Meeting of the WECAFC/CRFM/IFREMER Working Group on Shrimp and Groundfish
of the North Brazil-Guianas Shelf**

18-19 November 2020

Guianas Brazil Regional Fisheries Management Plan
Guianas-Brazil Shrimp and Groundfish
- Subregional FMP Concept

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Goal

Provide for the sustainable use of shared shrimp and groundfish fisheries resources of the Guianas-Brazil Shelf.

Preamble

The main fisheries resources of the Guianas-Brazil shelf (North Brazil Shelf LME) are the shrimp and groundfish species. The fisheries for these resources provide food security, foreign exchange earnings, and sustain the socio-economic development of coastal communities. Many of the primary commercial species depend on continental shelf, coastal, and river ecosystems over their life cycle. These supporting ecosystems, and thus the coastal and marine fisheries resources of this region, are shared by some or all of the coastal countries. There is the need for multilateral cooperation in managing these shared resources. Responsible use of these resources requires an ecosystem approach to fisheries management to deal with the complexities of heterogeneous fleets harvesting shared stocks of a diversity of species.

The Guianas-Brazil shelf adjoins six countries (Brazil, French Guiana, Guyana, Suriname, Trinidad and Tobago, and Venezuela) (Figure 1) whose Exclusive Economic Zones completely cover the continental shelf area (<200 m).



Figure 1 North Brazil shelf and adjoining countries (from http://onesharedocean.org/LME_17_North_Brazil_Shelf, accessed 03December2019)

Since the late 1990s work on the assessment and management of the shrimp and groundfish fisheries on the Guianas–Brazil Shelf led to the recognition that over-exploitation was happening and that a sub-regional mechanism would have to be put in place for effective decision-making and management of the shrimp and groundfish fisheries in the Guianas-Brazil area. Between 2011 and 2013, there were case studies on the shared shrimp and groundfish resources of the Guianas-Brazil shelf.

The case studies followed the EAF three part structure of ecological well-being, human well-being, and ability to achieve. (FAO, 2012)

The ecological status was reviewed from existing stock assessments for Guyana, Suriname, and Trinidad and Tobago. The broad conclusion was that the groundfish stocks were all likely to be fully exploited or over-exploited. Seabob was considered to be sustainably managed while at least some of the other penaeid shrimp stocks were at risk of over-exploitation. In Brazil the penaeid shrimp stocks were likely recovering after a period of over-exploitation but annual fluctuations were significant. Little information on the status of groundfish stocks was available for Brazil except to note that there were both directed groundfish fisheries and significant bycatch in the shrimp trawl fishery.

The economic performance of the various shrimp and groundfish fisheries has varied but a number of fleet sectors have downsized or ceased to operate due to economic factors (Brazil industrial trawlers, Suriname fish and shrimp trawlers, Venezuela industrial fleet). Where a detailed analysis was available (T&T/Venezuela multispecies-multifleet fisheries) it indicated that no further expansion should be allowed and that reduced fishing effort would be expected to produce greater economic benefits and reduced risks.

The governance analysis revealed two critical gaps for a subregional EAF fisheries management. The first issue is the lack of any body with a mandated decision-making function. The second gap is a disconnect amongst the various regional arrangements pertaining to fisheries-relevant issues e.g. transboundary pollution, habitat destruction, or piracy. The subregional fisheries management strategy includes means of closing these two gaps.

The current cycle of consultation and planning has included national consultations in Guyana, Suriname, and Trinidad and Tobago. This does not cover the full extent of the sub-region and the absence of other relevant countries from this planning process (Brazil, French Guiana, and Venezuela) may limit the effectiveness of multilateral action under this plan. Every effort is required to expand the scope of the planning process to include all the relevant countries.

Principles

The 1995 Code of Conduct for Responsible Fisheries (CCRF) sets out international principles, practices, and standards of behaviour to ensure effective conservation, management, and development of both marine and freshwater living aquatic resources. It accounts for the impact of fishing on ecosystems, the impact of ecosystems on fisheries, and the need to conserve biodiversity. The CCRF is directed toward members and non-members of the United Nations Food and Agriculture Organization; fishing entities; sub-regional, regional, and global organizations (governmental and nongovernmental); everyone concerned with conserving fishery resources, managing fisheries, and developing fisheries; and other users of the aquatic environment in relation to fisheries. After more than 20 years, the CCRF provides the primary guidance to achieving sustainable fisheries and aquaculture.

Several principles of the CCRF are of concern in this sub-regional management plan.

- Ecosystem Approach

The Reykjavik FAO Expert Consultation (FAO, 2003) agreed that the “purpose of an ecosystem approach to fisheries is to plan, develop and manage fisheries in a manner that addresses the multiplicity of societal needs and desires, without jeopardizing the options for future generations to benefit from a full range of goods and services provided by marine ecosystems”

- Precautionary approach

The UN Conference on Environment and Development (UNCED) Declaration provides that “the precautionary approach should be widely applied and that, where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation”. This approach has been adopted for fisheries in the UN Fish Stock Agreement and the FAO CCRF.

- Best available scientific information

As the precautionary principle demands taking decisions and actions in the face of uncertainty, it requires that risks be identified from the currently available information and that actions be taken to address and reduce the scientific uncertainties in a timely manner.

- Subsidiarity

Subsidiarity is a concept of governance in which decisions should be taken at the lowest competent level. Linked with decentralization and devolution, subsidiarity is a means to increasing direct involvement of stakeholders in decision-making. Subsidiarity depends on the creation of institutions at lower governance levels and the development of governance capacity at such levels.

Purpose

This plan seeks to provide short to medium term guidance to managers and industry in a framework for a multilateral EAF management of shared shrimp and groundfish resources and their ecosystems in the Guianas-Brazil region. It addresses the technical activities and requirements to guide national EAF management plans in support of shared resource management. Successful implementation of an EAF is expected to achieve long-term sustainability and improve the economic returns from the resources overall through stakeholder engagement and improved compliance.

Approach

As this fisheries management planning process is a first attempt to operationalise a subregional plan for these resources, it will address both strategic and short term objectives. Strategic, i.e. longer term, objectives are identified in the subregional fisheries management strategy document. This plan includes the technical elements to identify the relevant shared resources and provide suitable objectives, measures and monitoring for an ecosystem approach to FMPs for each resource.

Scope

The plan is intended for the whole NBSLME, so in principle should cover all countries involved in these shared resource fisheries. At this point, there is little evidence that there

are any meaningful separations between various shrimp and groundfish resources along the Guianas-Brazil shelf. Thus the entire resource complex should be treated as shared resources, and management guided by a subregional plan. However, so far Venezuela has not been active in deliberations and discussions, as it is not part of the CLME+ project and has not attended recent WG meetings. Fisheries in French Guiana are regulated under EU directives and regulations and use TACs as a control measure. In the case of Brazil they have not been part of this current process but have been working on national EAF based plans for the industrial shrimp fishery in different regions, including North Brazil with support from REBYC II LAC project and CLME+.

Existing Management Objectives

The national plans of Guyana, Suriname and Trinidad and Tobago each specify objectives for the fisheries sector overall as well as sector-specific objectives in some cases. Objectives specified for the marine fisheries sector overall are summarised from the relevant national plans below.

National Fisheries Management Objectives		
Guyana	Suriname	Trinidad and Tobago
Maintain and improve nutrition, social and economic benefits from current fisheries	Guaranteeing food security for the whole of the country's population Guaranteeing food safety in the fisheries sector	Ensure that living marine resources can be optimally utilized in a manner that is sustainable in the long term so as to contribute to food security, employment and development of the people of current and future generations
Prioritise increasing incomes of artisanal fishermen, e.g. through better access to processing and marketing facilities	Increasing the contribution of the fisheries sector to the national economy Development of the fisheries sector into a food producer and food supplier for the Caribbean	
Match fishing capacity to resource availability – i.e. ensure sustainable exploitation and introduce environmentally sound practices.	Promotion and development of sustainable fisheries Creation of suitable conditions for the sustainable development of aquaculture Managing the risks and constraints in the implementation of the fisheries policy	Final Action Plan to address Illegal, Unreported and Unregulated Fishing in the Ports and Waters under the Jurisdiction of Trinidad and Tobago (<i>in prep</i>)

Overall Subregional Management Objectives

The existing management objectives expressed in national management plans listed above provide a starting point to identify common management objectives and lead to joint or harmonised actions to achieve them. This harmonised approach provides guidance to national parties when addressing shared resources issues in national FMPs and for implementation at the national level. The subregional objectives include:

Sustainability (Ecological Well-being)

Fisheries of the subregion are intended to be managed in a sustainable manner to provide long-term benefits and inter-generational equity by ecologically and environmentally sound practices.

Food Security (Human Well-being)

Fisheries of the subregion are intended to contribute to national and regional food security through the supply of high quality, nutritious, and safe seafood to local, national and regional markets

Economic contribution (Human Well-being)

Fisheries of the subregion are intended to provide jobs of decent work, sustain coastal communities and livelihoods, and contribute to foreign exchange earnings via exports.

Implementation (Ability to Achieve)

Achieving the ecological and human well-being objectives requires identifying and managing the risks and constraints in the implementation of the FMP. One unavoidable constraint is the present lack of any multilateral capacity for MCS or other operational implementation. Implementation of the subregional FMP, and achievement of the objectives reflected in the sub-regional FMPs for species and groups, is dependent on the agreed management actions being fully reflected and implemented in national plans.

Shared Resources Inventory

The first technical activity required is to establish and maintain an inventory of the shared shrimp and groundfish resources and supporting ecosystems in the subregion which identifies which countries share which resources. This needs to include both the national areas considered in this plan (Guyana, Suriname, Trinidad and Tobago) and the other sub-regional shelf areas (Venezuela, French Guiana, Northern Brazil).

Four main shared fisheries resources have been identified along the Guianas-Brazil shelf for consideration in this sub-regional fisheries management plan. For most species and groups, with the exception of seabob, there is little or no information on species stock structure within the sub-regional groupings. It is quite likely that some species may include multiple biological stocks while others may be part of wider linkages beyond the NBSLME. The precautionary approach requires that management efforts reflect the risks associated with uncertainties in the stock structure.

Shared resource/fishery	Target species	Associated species	Primary gear(s)
Seabob	Seabob	Green weakfish, Acoupa weakfish	trawler, minor artisanal
Penaeid shrimps	Southern brown shrimp, Pinkspot shrimp, Southern pink shrimp, Southern white shrimp	King weakfish, Whitemouth croaker, Jamaica weakfish, Lane snapper, Acoupa weakfish	trawler
Groundfish – Industrial or semi-industrial	Southern red snapper, Weakfish, Whitemouth croaker, Sea catfish	Barracuda, Black grunt	trawler, gillnet, others
Groundfish - Small-scale fisheries	Sciaenids and Catfishes	King weakfish, Gillbacker, Acoupa weakfish, Sea catfish, Lane snapper	many gears
Southern red snapper	Southern red snapper	Acoupa weakfish, Lane snapper, Other snappers	hook and line

Stock Status – stock assessment, research needs, and information gaps

There have been stock assessments conducted for various resource species or groups however some are getting rather dated (before 2012) and most do not correspond to the full sub-regional stock area. The stock assessment results that are available indicate a common theme of a high likelihood that the concerned stocks were overfished and overfishing was continuing. Where recent stock assessment information is available it is included in the resource-specific management plans below.

Efforts to improve the quality, quantity and accessibility of the primary fisheries data for industrial fisheries data have shown some progress but there has been less progress to improve data availability from artisanal fisheries in the sub-region. There is also a lack of information on IUU fishing, and socio-economic data for these fisheries.

Stock assessment data was compiled in 2018 for many of the subregional stocks through a Data Preparation Workshop (FAO, 2019). These data are to provide the basis of a regional stock assessment training programme and then an updated set of stock assessments will be prepared for the subregional stocks. Provisions in the present plan may require updating when new stock assessment results are available.

The need for (Sub-) regional databases (including catch and effort, vessel inventory, license status and biological sampling) is long outstanding and is currently being addressed with WECAFC 16 establishing a working group on fisheries data and statistics (FDS-WG). The FDS-WG is to continue the WECAFC-FIRMS progress towards developing the required regional databases. These data systems must be integral with data systems for MCS and operational requirements as specified in the RPOA-IUU. Work by the FDS-WG should be closely coordinated with the Regional Working Group on IUU.

Sub-regional management issues and recommendations

During the 2012 final workshop on the subregional case study for shrimp and groundfish fisheries of the Guianas-Brazil shelf (FAO, 2012) the participants compiled a consolidated list of issues pertaining to each of the EAF components from the separate perspectives of senior officers (CFO or Director), fisherfolk, and technical fisheries officers (Table 1).

Table 1 Identified issues affecting the fisheries of the Guianas-Brazil Shelf

Component	Main issues
Ecological well-being	<ol style="list-style-type: none"> 1. Declining stocks of target species 2. Destruction of breeding grounds and catch of juveniles 3. Damage caused to habitat by trawling activities 4. Insufficient or limited knowledge on biology of target and non-target species 5. High level of bycatch, including of juveniles of commercially important species, in industrial fishing 6. Pollution impacts on estuaries and mangroves: nursery areas and Protected Areas
Human well-being	<ol style="list-style-type: none"> 1. Inadequate social security 2. Insufficient basic infrastructure 3. Poor conditions on board and safety at sea 4. Fishers competing for same resources and conflict for space 5. Dependence on fisheries for the livelihood – no alternative means of employment 6. Loss of employment (decreasing catch and seasonality) 7. Low contribution of fisheries products to national GDP. There is potential to increase value added of product and foreign exchange earnings 8. Contamination of fish 9. Insufficient skilled workers with specific expertise in different fields
Governance	<ol style="list-style-type: none"> 1. Poor control surveillance and enforcement 2. Piracy 3. Insufficient zoning to regulate the activity of the different fisheries and other sectors 4. Insufficient ecological research/scientific information to support management measures and management plans 5. Existing legislation is outdated and inadequate for fisheries management 6. Inadequate support for administration and management of fisheries 7. Inadequate flow of information, especially between government and industry 8. Insufficient capacity in the industry to sustain viable fisherfolk organizations 9. No functional multi-stakeholder management committees that could be involved in the planning process 10. Effect of climate change/global warming
<p>Taken from: FAO. 2012. Case Study on Shared Stocks of the Shrimp and Groundfish Fisheries of the Guianas-Brazil Shelf, Final Regional Workshop, Port-of-Spain, 16-18 October 2012. CLME Case Study on shrimp and groundfish - Report. No.10</p>	

Many of the above issues, or aspects of them, were also reflected in the discussions in the process of developing this plan. The following cross-cutting fisheries management issues have been identified.

Fisheries Management Information

Fisheries management information includes collection and compilation of accurate, timely, and complete data from and about the fisheries, preparation of analytical products (e.g. stock assessments, economic performance, social outcomes), and access to or and dissemination of data and data products nationally and subregionally.

Countries must ensure that species and stock specific fisheries data (catch, effort, socio-economic) and biological data (size composition, maturity) are collected in a manner which meets agreed regional and international standards and practices.

Establish (sub)regional databases reflecting species and stock specific fisheries data (catch, effort, socio-economic) and biological data (size composition, maturity) for shared stocks and resources

Establish (sub)regional reporting standards and schedules for national submission of shared stocks data to the subregional database.

Establish (sub)regional document repository and website access for stock assessments and other reports, FMPs, and other management documents.

Operational fisheries management and compliance

National capacity for MCS operations is limited in all subregional countries and there are no subregional agencies or capacity. Thus FMP compliance will be heavily dependent on effective co-management engagement with the relevant fisheries sectors. However, efforts to improve FMP compliance through stakeholder processes must also be supported by credible operational MCS.

Stakeholders have consistently and frequently identified criminal activities as their most important issue. These activities include marine theft “piracy”, violent assault, murder, and threats and intimidation. Effective MCS and law enforcement will improve both fishers security of life and livelihood, as well as compliance with FMP provisions. Countries are to establish, or improve existing, operational capacities for at-sea and land-based law enforcement by incorporating national security agencies, fisheries agencies and co-management bodies into a coherent and comprehensive marine law enforcement system.

Finalise and implement the Regional strategy on bycatch management (WECAFC S&G 2018). The planned provisions of the draft regional strategy on bycatch management will require implementation at the national level. In many cases these requirements will be similar to or identical to the requirements for implementation of the subregional FMP.

Implement in national FMPs the provisions of the Regional Plan of Action on Illegal, Unreported and Unregulated Fishing. In many cases these requirements will be similar to or identical to the requirements for implementation of the subregional FMP.

Environment and Climate

Pollution, habitat degradation, and climate change are all having impacts on the traditional fishing areas and fisheries of the region. Some of these issues arise from the fisheries themselves while others are exogenous to the fisheries but FMPs must provide means to mitigate the impacts.

Pollution from land-based sources (industrial, agriculture, municipal), or marine hydrocarbon production can impact spawning and nursery grounds, adult survival, and food safety of fish products. Fisheries agencies must be active in identifying such cases and working with stakeholders to mitigate or eliminate such impacts.

Habitat loss or degradation may be driven by pollution, land-based or coastal alterations, or fishing. Regulating the spatial distribution and total effort of high-impact gears such as

heavy bottom trawls is needed to ensure the fisheries themselves are not the cause of habitat degradation and loss. Seasonal and spatial management should be used where possible to mitigate contamination issues to ensure high quality and safe seafood.

Seasonal and spatial management measures should be reviewed and adapted to reflect climate-driven changes in stock biology such as spawning closures or nursery seasons.

Monitoring and Evaluation

- A system for monitoring the effectiveness of the regional/national governance mechanism described here.
- GEAF in the Fisheries Management Strategy document

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Seabob sub-regional fisheries management plan

Atlantic seabob, (*Xiphopenaeus kroyeri*), is a commercially important prawn in the family Penaeidae. It is distributed in the Western Atlantic from the southern USA, including Gulf of Mexico to Brazil. It is intensely fished along the Gulf of Mexico coast and on the Guianas-Brazil shelf area. Minor fisheries exist in other localised parts of the Caribbean as well. Global catches have fluctuated at over 40,000 t (39,300-52,700) since 2000 with no clear trends.

The Seabob fishery of the Guianas-Brazil shelf is conducted primarily by Brazil, Guyana and Suriname, accounting for well over 90% of the global catches. The Seabob stock distribution includes the shelf areas of French Guiana however fisheries regulations there prevent trawling in the shallower shelf area and hence Seabob is an insignificant fraction of the catch in French Guiana. Guyana and Suriname account for about 60% globally since 2000 and these two countries are addressed as a single management unit in this plan.

The limited scope of this plan is dictated by current national engagement however at this time there is no stock structure information available to support separating this fishery from the seabob stocks in French Guiana and Northern Brazil. Determination of suitable stock structure and management unit designations should be a high priority.

Description of the Fishery

In Guyana and Suriname the seabob fishery is conducted using primarily mechanised shrimp trawlers and has taken about 30,000 t annually since 2000. Artisanal fisheries using Chinese seine take less than 5% of the catch.

	Vessels (2017)	Catches		
		Average (2000-2015)	2016	2017
Guyana	87	18,100	20,300	21,800
Suriname	22	8800	7700	7700
Total	109	26,900	28,000	29,500

Stock assessment of the seabob stocks in 2012 estimated that the stock was above the B_{MSY} target and fishing mortality was well below F_{MSY} , however these estimates were considered preliminary and may have been optimistic. An updated assessment in 2013 concluded the stock was likely fully exploited but not overfished.

Governance

The multilateral institutional arrangements governing this fishery are described in the main body of the FMP. Of specific relevance has been the various formulations of the Shrimp and Groundfish Working Group that have provided scientific and management advice for this fishery since the 1990s.

The international or regional policies and legislation bearing on this plan and the relevant national legislation, policies and management plans for marine fisheries are described in the

main body of the FMP. In addition, both Guyana and Suriname have seabob-specific FMPs and both countries fisheries are certified under the Marine Stewardship Council (MSC).

Seabob-specific policies and legislation	
Guyana	Suriname
Guyana Seabob Management Plan 2015-2020 Harvest Control Rule 2014 MSC Certification	Seabob Fisheries Management Plan MSC Certification

Description of Process Leading to the Plan

This Sub-regional Seabob FMP has been developed through a process of national consultations and extraction from national plans. Both Guyana and Suriname have existing FMP covering seabob addressing known issues and concerns. National plans included stakeholder consultations for draft preparation and then in a review of the proposed plan.

In Guyana, the draft plan was prepared by a Seabob Working Group of Fisheries Department and stakeholders, and then was also reviewed by the Fisheries Advisory Committee.

In Suriname the current plan was formulated for the period 2014-2018. A revised plan for 2019-2023 is nearing completion. Review by the Fisheries Advisory Committee will follow and recommendation to the Minister. Plan provisions discussed herein refer to the 2014-2018 plan as it forms the basis for the draft plan for 2019-2023 which is only available in Dutch.

Stakeholder consultations were held in Guyana and Suriname to focus on the requirements of a sub-regional EAF management plan. Preliminary presentations provided background on the EAF in general and the present process in the Caribbean under the CLME+ project. Consultations on issues followed an open format, allowing stakeholders to raise issues as desired as well as considering a pre-determined range of issues put forward by the Fisheries Department and consultants.

Goals and Objectives

The existing national plans of Guyana and Suriname each specify objectives for the fisheries sector overall and the seabob-specific management plan. The table below attempts to align the national objectives along thematic lines.

Seabob specific objectives	
Guyana	Suriname
Obtain and maintain MSC certification of the fishery	Maintain MSC certification of the fishery
Implement harvest control rules and maintain the stock assessment process	Fleet capacity must be consistent with sustainable exploitation of fish stocks
Implement BRDs and VMS for the seabob fleet, and maintain the use of TEDs	Encouragement of the use of the best available fishing techniques; Reduction of unwanted bycatch and reduction of the bycatch of protected species

Seabob specific objectives	
Guyana	Suriname
Establish a fathom line for the seabob fishery which will minimise gear conflict with the artisanal fishery	Control and enforcement guaranteeing adherence to rules and regulations
Develop a policy for controlling the total finfish catch by trawlers	Encouragement of the use of the best available fishing techniques
Maintain and support the Seabob Working Group in order to take management decisions in a participatory fashion, and to address any conditions or preconditions arising from MSC assessment	Increasing stakeholder support for the fisheries policy
Develop a research plan for the fishery	Improvement of both quality and quantity of information on fish stocks status and marine ecosystems, and stimulation of research that provides information and recommendations for improved decision-making
	Increasing the international market share by improving quality, increasing added value, and ensuring a continuous supply

The stock-specific management objectives expressed in national management plans listed above provide a starting point to identify common management objectives and lead to joint or harmonised actions to achieve them. This harmonised approach provides guidance to national parties when addressing shared resources issues in national FMPs and for implementation at the national level.

Sub-regional Seabob management objectives

Marine Stewardship Council certification

Conduct seabob fisheries in compliance with and under MSC certification standards.

Fisheries management information

Ensure adequate data collection in both quantity and quality to provide information on seabob stock status, bycatch species quantities and composition, and management measures evaluation.

Identify research needs and establish joint efforts to address them.

Participate in and contribute the scientific and management advisory effort of the shrimp and groundfish working group to complete regular subregional stock assessments and update fisheries management plans including harvest control rules where established.

Collect and provide information to monitor management effectiveness and assess compliance with Subregional FMP provisions.

Operational fisheries management

Establish limits of vessel numbers and capacity to ensure economically and ecologically sustainable seabob fisheries in each country. Coordinate other effort controls such as seasonal limits, depth zones, and gear regulations to ensure consistency of intent and practice amongst countries.

Address the issues of bycatch in seabob trawling by requiring the use of approved Turtle Excluder Devices and approved Bycatch Reduction Devices on all seabob trawlers

Establish and require the use of approved Vessel Monitoring Systems on all seabob trawlers

Management issues and problems

Management unit and stock structure

This plan is for an arbitrary management unit based on the two countries actively involved in this process. Seabob stocks are distributed in the near shore area and it is not clear to what extent they overlap national boundaries. In the absence of evidence of discrete stocks it is precautionary to manage on the basis that the two national fisheries are in fact sharing a single resource. This also ignores the potential impacts of fisheries in French Guiana, which are expected to be minimal, and Northern Brazil which may well be exploiting the same biological stock.

A two track approach to this issue is possible. In the short term, stock assessment and management measures based on a single stock supporting the fisheries in all four countries would allow for harmonised management throughout this area.

Research to identify stock structure by mapping and/or genetic studies may provide evidence to delimit multiple management units within the Guianas-Northern Brazil shelf area.

Bycatch including turtles

Some fraction of the finfish and shrimp bycatch in the seabob fishery can be utilised however the greater part of it is not marketable. The discarded bycatch includes undersized finfish and shrimps, elasmobranchs, benthos etc. The bycatch can be reduced with suitable Bycatch Reduction Devices (BRDs). In addition, turtles have specific protection through the required use of Turtle Excluder Devices (TEDs). Current research into combined devices Trash and Turtle Excluder Devices (TTEDs) is ongoing and shows good potential to reduce catches of turtles, endangered and threatened species, and reduce the discarded bycatch of finfish and shrimp.

Activities

Existing management measures in place in National FMPs of Guyana and Suriname only require some minor adjustments to be consistent across this FMP area.

Guianas Brazil Regional Fisheries Management Plan -- Seabob

	Guyana	Suriname
Effort	Sea days limit (225) regulated by HCR	Regulated by HCR
	Closed season based on catch composition min 6 weeks, max 8 weeks	
	Vessel numbers limit (87), maximum 500 hp	Number of licenses limited
Technical measures	BRD and TED required	BRD and TED required
	VMS required	VMS required
	Area/depth restriction, 8-18 m	Area/depth restriction, 10-15 fm, or 10-18 fm depending on location
		Obligatory landing in Suriname
Information	Last haul programme	Landing reported (Artisanal) Logbook (Industrial)
	Fishers are registered and licensed	Fishing vessels are registered with MAS and licensed by Fisheries Department
	Export licenses required from Fisheries Department	

	Subregional harmonised activities	
Effort	Sea days limit regulated by HCR based on joint stock assessment and total fishing effort, i.e. total vessel-days and not days/vessel	
	Closed season based on catch composition	
	Vessel numbers limit per country and maximum horsepower	
Technical measures	BRD and TED required	
	VMS required	
	Area/depth restriction to be made consistent, particularly in the marine boundary area between Guyana and Suriname	
	Gear mesh sizes and other regulations to be consistent	
Information	Catch, effort and size composition data collected to joint standards	
	Bycatch quantity and composition data collected to joint standards	
	Fishers are registered and licensed	
	Fishing vessels are registered and licensed	
	Export licenses required from Fisheries Department	

Decision Rules and Procedures

Both Guyana and Suriname have very similar Harvest Control Rules (HCR) based on the estimated maximum effort limited to ensure that spawning stock biomass remains at or above the target using CPUE as an index. If catch rates drop below target index values, the total allowable sea days are reduced.

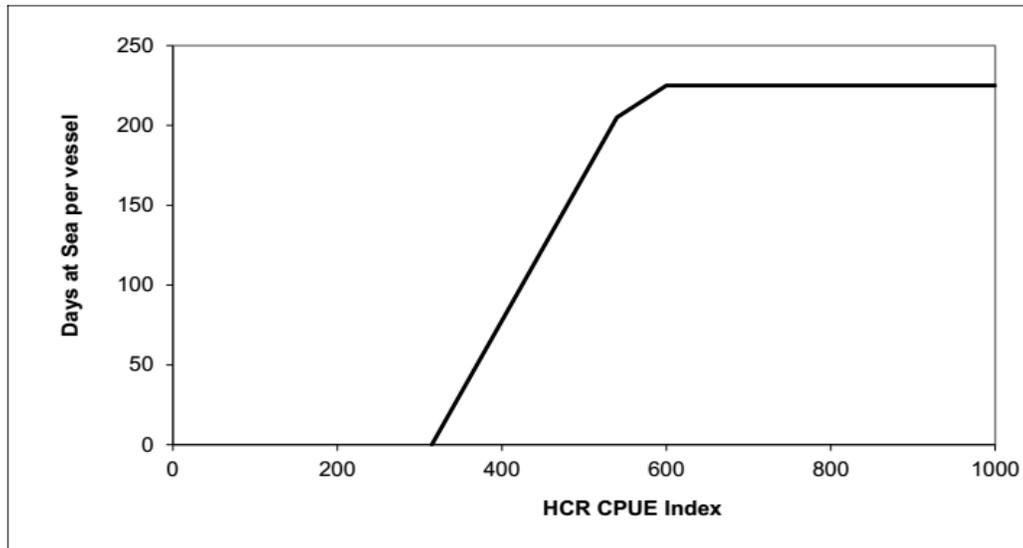


FIGURE 8: GRAPHICAL REPRESENTATION OF THE PROPOSED HARVEST CONTROL RULE, WITH THE NOMINAL DAYS-AT-SEA PER VESSEL BASED ON A MAXIMUM OF 87 VESSELS. THE HCR INDEX IS IN KILOGRAMS OF PROCESSED SEABOB TAIL WEIGHT PER STANDARDISED DAY AT SEA

(from Guyana Seabob Management Plan (2015-2020))

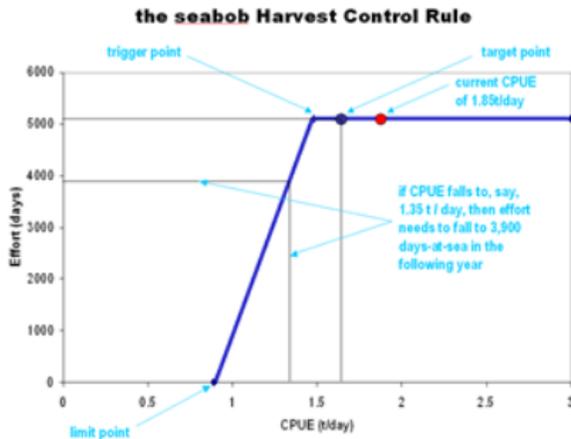


Figure 7. Schematic explanation of the Seabob Fishery harvest control rule (HCR). (Source: Seabob Fishery Management Plan.)

(from Fisheries Management Plan for Suriname 2014-2018)

Extracts from the two plans are available but it is not clear whether the units involved are the same. In the case of Guyana the trigger point is specified as 600 kg/standard day fishing of processed tail weight. The Suriname trigger point is indicated to be 1.5 t/ day but the product form is not specified. Given published conversion factors for seabob (tail wt = 0.641*live weight), these two trigger points do not appear to correspond to the same biological value. A joint assessment and determination of trigger point catch rates is needed. It is recommended that the joint HCR express fishing effort in total fishing days, and the CPUE Index in kg/day of a specific product form (e.g. processed tail weight).

Parameter	Guyana	Suriname
Fishing effort	20,010 total fishing days = 230 days/boat (x 87 boats)	5000 total fishing days
CPUE Index	kg/day processed tail weight	kg/day (equiv. t/day) product form not indicated
Trigger value	600 kg/day	1500 kg/day
Limit point (estimated by eye from HCR figures)	325 kg/day	900 kg/day

Monitoring and Evaluation

Review

At this time the only body acting at the sub-regional scale is the WECAFC/ CRFM/ IFREMER Working Group on Shrimp and Groundfish in the Northern Brazil-Guianas Shelf. It is recommended that this working group undertake the regular (period to be determined) review of the sub-regional plan.

Communication Strategy

Fill in

Penaeid shrimp sub-regional fisheries management plan

Penaeid shrimps (family Penaeidae) support a major export-oriented fishery from the North Brazil Shelf LME. The major target species vary markedly in distribution throughout the NBSLME however, and consistent fisheries statistics are not available for individual species. This plan pertains to the penaeid shrimp fisheries of the NBSLME, excluding Seabob.

Southern brown shrimp	<i>Farfantepenaeus subtilis</i>
Pinkspotted shrimp (Red spotted shrimp)	<i>Farfantepenaeus brasiliensis</i>
Southern pink shrimp	<i>Farfantepenaeus notialis</i>
Southern white shrimp	<i>Litopenaeus schmitti</i>

In Guyana and Suriname, seabob (*X. kroyeri*) are managed under species-specific plans and not included in the shrimp FMP. Seabob is a minor component in the catches in Trinidad and Tobago and does not warrant separate management.

Description of the Fishery

Shrimp fisheries are predominantly conducted with Gulf of Mexico-style double-rig trawlers throughout this subregion. Artisanal fisheries account for minor landings in some countries using smaller trawlers, traps and nets. In French Guiana shrimp are processed at sea and landed for export. In the other countries shrimp are landed and processed locally although most are eventually exported.

Southern brown shrimp (*F. subtilis*) is the most important and widely fished species in the group. They are more abundant in the eastern parts of the NBSLME although it is also important in the Gulf of Paria. Southern white shrimp (*L. schmitti*) is also valuable in the Gulf of Paria. Pinkspotted shrimp (*F. brasiliensis*) is more important in Guyana and Suriname than elsewhere. Statistical information from the FAO database does not provide complete separation of the shrimp species. The following catches are based on average annual total shrimp catches excluding Seabob. Where required, a live weight:tail weight conversion factor of 0.641 was used.

	2000-2015	2016	2017	
Brazil*	4017*			Mostly <i>F. subtilis</i> , also <i>L. schmitti</i>
French Guiana	1922	700	665	Mostly <i>F. subtilis</i> , also <i>F. brasiliensis</i>
Guyana	2263	1216	1686	<i>F. subtilis</i> , <i>F. brasiliensis</i> , <i>F. notialis</i>
Suriname	2664	377	380	Mostly <i>F. subtilis</i> , also <i>F. brasiliensis</i>
Trinidad and Tobago	742	687	687	<i>F. subtilis</i> , <i>F. notialis</i> , <i>L. schmitti</i>
Venezuela	6209	2498	2575	<i>F. subtilis</i> , <i>L. schmitti</i>
Total	35967	26178	26193	

* North Brazil shelf for 2000-2013 taken from FAO Fisheries Circular C1120, Annex 1 Table 18

The numbers of trawlers targeting penaeid shrimps declined in each of the subregional countries. This has been attributed to a combination of factors including declining catch rates, increasing costs of fishing, and management interventions. Expected gains in catch rates and stock status have not been widely seen and recent stock assessments continue to indicate full or over-exploitation of these stocks. Over-capitalisation, reported in at least some countries, continues to drive high exploitation rates. Fisheries and fisheries trends on

the continental shelf (Northern Brazil, French Guiana, Suriname, and Guyana) in vessel numbers, catches, and catch rates, have differed from those in the Gulf of Paria (Trinidad and Tobago and Venezuela).

Suriname shrimp fisheries include both deep-sea shrimp fisheries and large sea shrimp fisheries, the latter targeting the species listed above. The deep-sea shrimp fishery is limited in size, only 4 vessels are allowed and operates in depths greater than 45 fm (82.3 m). The target species include Scarlet shrimp (*Pleisopenaeus edwardsianus*), Orange shrimp (*Solenocera acuminata*), Royal red shrimp (*Pleotiocus robustus*), and Deep-water rose shrimp (*Parapenaeus longirostris*). Bycatches of brown shrimp and pinkspotted shrimp are known to occur.

Governance

The multilateral institutional arrangements governing this fishery are described in the main body of the FMP. Of specific relevance has been the various formulations of the Shrimp and Groundfish Working Group that have provided scientific and management advice for this fishery since the 1990s.

The international or regional policies and legislation bearing on this plan and the relevant national legislation, policies and management plans for marine fisheries are described in the main body of the FMP.

Description of Process Leading to the Plan

This Sub-regional Shrimp FMP has been developed through a process of national consultations and extraction from national plans. Existing national FMPs covering shrimp address known issues and concerns. National plans in each case included stakeholder consultations for draft preparation and then in a review of the proposed plan.

In Guyana, the draft plan was prepared by the Fisheries Department and reviewed by stakeholders in public validation workshops. The draft plan was also reviewed by the Fisheries Advisory Committee prior to being submitted for Ministerial approval.

In Suriname the current plan was formulated for the period 2014-2018. A revised plan for 2019-2023 is nearing completion. Review by the Fisheries Advisory Committee will follow and make recommendation to the Minister. Plan provisions discussed herein refer to the 2014-2018 plan as it forms the basis for the draft plan for 2019-2023 which is only available in Dutch.

In Trinidad specific measures to regulate the trawl fishery were implemented by Cabinet Order in 2013. A draft Management Plan for the Shrimp Fishery was developed in 2014 based on stakeholder consultations and a report and recommendations submitted by a multi-sectoral stakeholder committee.

Stakeholder consultations were held in Guyana, Suriname, and Trinidad and Tobago to focus on the requirements of a sub-regional EAF management plan. Preliminary presentations provided background on the EAF in general and the present process in the Caribbean under the CLME+ project. Consultations on issues followed an open format, allowing stakeholders to raise issues as desired as well as considering a pre-determined range of issues put forward by the Fisheries Department and consultants.

Goals and Objectives

There do not appear to be shrimp-specific policies or legislation in place for any of these countries. The national FMPs of Guyana, Suriname and Trinidad and Tobago each specify objectives for the fisheries sector overall and for the shrimp fisheries specifically.

Shrimp specific objectives		
Guyana	Suriname	Trinidad and Tobago
Continue use of TEDs and fully implement BRDs	Continue use of TEDs and fully implement BRDs	Improve gear selectivity to minimise impact of fishing on the ecosystem, avoid waste and the capture of undersize shrimp by introducing Trawl Efficiency Devices, including Turtle Excluder Devices (TEDs) and Bycatch Reduction Devices (BRDs) and appropriate specification of minimum cod-end mesh sizes
Establish VMS for shrimp fleet		
Stocks at or above 50% of unfished levels		Maintain spawning stock above minimum acceptable level (limit reference point) to ensure there are sufficient shrimp to replenish the stock, by monitoring the stock status and limiting fishing mortality
Sustainable and precautionary management in place		Limit fishing mortality to safe, sustainable levels, by capping fishing fleet capacity and closing the fishery annually to allow stocks to recover to their full potential

Guianas Brazil Regional Fisheries Management Plan -- Shrimp

Shrimp specific objectives		
Guyana	Suriname	Trinidad and Tobago
Ecosystem-level impacts of the fishery at an acceptable level		Maintain all fish populations above minimum levels by improving gear selectivity, monitoring key indicator species, and minimizing fishing activity in vulnerable marine ecosystems Protect habitat and other ecosystem components by improving selectivity and minimising fishing activity in vulnerable marine ecosystems
All shrimp vessels supplying daily logsheets with catch and effort		
Estimates of IUU catch obtained		
		Protect and improve the fishing industry's socio-economic performance so that it applies best practice in terms of fishery operations and small business, by providing training to fishers and their co-workers in such areas as small business management, marketing, and minimising post-harvest losses
Regional stock assessment process in place and stock assessment completed		Improve the management response to evaluation findings by increasing stakeholder participation in management decision-making
(Regional) management actions in place to respond to stock assessment outcomes		

The shrimp-specific management objectives expressed in national management plans listed above provide a starting point to identify common management objectives and lead to joint or harmonised actions to achieve them. This harmonised approach provides guidance to national parties when addressing shared resources issues in national FMPs and for implementation at the national level.

Sub-regional Shrimp management objectives

Sustainable and responsible shrimp fisheries operational

Ensure fishing effort is managed to maintain shrimp stocks above target levels in an ecologically responsible manner and providing long-term economic benefits.

Minimise impacts on vulnerable or threatened species through the use of Turtle Excluder Devices or Trash-Turtle Excluder Devices and various effort management measures.

Minimise the take of unutilised and undersized bycatch through the use of improved Bycatch Reduction Devices and various effort management measures.

Protect habitat and other ecosystem components by improving selectivity and minimising fishing activity in vulnerable marine ecosystems.

Fisheries management information

Ensure adequate data collection in both quantity and quality to provide information on shrimp stock catches by species, shrimp and bycatch species quantities and composition.

Ensure fishing effort data is collected to support both stock assessment and operational management requirements.

Conduct stock assessments and management measures evaluation to identify suitable, species-specific target and limit reference points.

Identify research needs and establish joint efforts to address them.

Participate in and contribute the scientific and management advisory effort of the shrimp and groundfish working group to complete regular subregional stock assessments and update fisheries management plans including harvest control rules where established.

Collect and provide information to monitor management effectiveness and assess compliance with Subregional FMP provisions.

Operational fisheries management

Establish limits of vessel numbers and capacity to ensure economically and ecologically sustainable shrimp fisheries in each country. Coordinate other effort controls such as seasonal limits, depth zones, and gear regulations to ensure consistency of intent and practice amongst countries.

Address the issues of bycatch in seabob trawling by requiring the use of approved Turtle Excluder Devices and approved Bycatch Reduction Devices on all seabob trawlers

Establish and require the use of vessel tracking systems, such as Vessel Monitoring Systems or Automatic Information Systems, on all trawlers for both management and Safety of Life at Sea purposes.

Detect and eliminate IUU fishing in the subregional shrimp fisheries.

Management issues and problems

Management units and stock structure

Provisions of this plan are for an arbitrary, multi-species management unit encompassing the entire NBSLME. There is a clear need to identify and separate at least species-specific management, and very possibly geographical stocks within species, to provide robust and biologically based management advice.

Bycatch, including turtles

Some fraction of the finfish and invertebrate bycatch in shrimp fisheries can be utilised however the greater part of it is not marketable. The discarded bycatch includes undersized finfish and shrimps, elasmobranchs, benthos etc. The bycatch can be reduced with suitable Bycatch Reduction Devices (BRDs). In addition, turtles have specific protection through the required use of Turtle Excluder Devices (TEDs). Current research into combined devices Trash and Turtle Excluder Devices (TTEDs) is ongoing and shows good potential to reduce catches of turtles, endangered and threatened species, and reduce the discarded bycatch of finfish and shrimp. Ensuring fleet-wide and consistent use of these devices is required.

Means to ensure sustainable and economically valuable utilisation of unavoidable bycatch are required. Management of the bycatch species will require harmonised data, stock assessment and management measures for these species throughout the subregion and harmonised plans between shrimp FMP and FMP for various bycatch species.

Data, information and access

Significant improvements in catch reporting from shrimp fisheries are required to estimate the shrimp species composition and the bycatch species composition. Stock discrimination studies including genetic work will require biological samples in addition to fisheries statistical data.

Data collection, stock assessment and stakeholder access to management information

Registration and licensing of all vessels, esp. artisanal

Declining catch rates and abundance – direct or indirect fishery effects or environmental?

Activities

Existing management measures in place in National FMP

	Guyana	Suriname	Trinidad and Tobago
Effort		Number of licenses limited – Large sea shrimp to 25 vessels and Deep-sea shrimp to 4 vessels, maximum 500 hp	Authorization of fishing vessels to fish on the high seas
			Prevent new artisanal and non-artisanal trawlers from entering the fishery

Guianas Brazil Regional Fisheries Management Plan -- Shrimp

		Increases in licenses will require stock assessment evidence that stocks have been adequately rebuilt	Limit fishing effort through license restriction and potential buy-out programme
Technical measures	BRD and TED required	BRD and TED required	TED required and BRD to be required
	VMS required	VMS required	VMS to be required
		Area/depth restriction, >15 fm, or >45 fm for Deep-sea license	Define further restrictions to the areas in which the two groups of trawlers (<i>Industrial and Artisanal</i>) may operate
			A two month closed season (September - October) for artisanal trawlers and four month closed season (July-October) for non-artisanal trawlers
		Mesh size minimum 45 mm	Minimum mesh size of 35 mm to be used in the cod-ends of shrimp trawl nets
Information	Catch and effort recorded in logbooks, Last haul programme for size sampling	Landing reported (Artisanal) Logbook (Industrial)	Improved trip reporting system for non-artisanal vessels – move to logbook system
	Fishers are registered and licensed	Fishing vessels are registered with MAS and licensed by Fisheries Department	Record of Fishing Vessels, complete vessel census
	Export licenses required from Fisheries Department	Mandatory landings in Suriname	Stakeholder engagement and consultation in the management decision-making process

Harmonised activities to address shrimp management across the subregion are below.

Subregional harmonised activities	
Effort	Sea days limit regulated by HCR based on joint stock assessment and total fishing effort, i.e. total vessel·days and not days/vessel
	Closed season based on catch composition including groundfish bycatch (e.g. juveniles and undersized groundfish)
	Vessel numbers limit per country and maximum horsepower for shrimp-directed fisheries including artisanal sector

	Subregional harmonised activities
Technical measures	BRD and TED required for all trawlers
	VMS required
	Area/depth restriction to be made consistent across shared fishing areas
	Gear mesh sizes and other regulations to be consistent
Information	Catch, effort and size composition data collected to joint standards
	Bycatch quantity and composition data collected to joint standards
	Fishers are registered and licensed
	Fishing vessels are registered and licensed
	Export licenses required from Fisheries Department

Decision Rules and Procedures

None of the countries involved have specified harvest control rules in the existing management plans for shrimp fisheries. The need for a regional assessment and corresponding regional management plan is specifically reflected in the Guyana plan and well understood across the countries involved.

Monitoring and Evaluation

Review

At this time the only body acting at the sub-regional scale is the WECAFC/ CRFM/ IFREMER Working Group on Shrimp and Groundfish in the Northern Brazil-Guianas Shelf. It is recommended that this working group undertake the regular (period to be determined) review of the sub-regional plan

Communication Strategy

Fill in

Groundfish sub-regional fisheries management plan

The Groundfish fisheries in the North Brazil Shelf LME are the most complex covered under this subregional plan. They are multi-species, multi-gear and multi-sectoral, in having both artisanal and industrial components. More than 45 species are reported from subregional catches. A large fraction of the catch, 75% or more, comes from the most significant groups, the croakers (*Scienidae*), in particular weakfishes (*Cynoscion sp*) and the Whitemouth croaker (*Micropogonias furnieri*), the sea catfishes (*Ariidae*) and snappers (*Lutjanidae*).

The Southern red snapper (*Lutjanus purpureus*) is another important groundfish species which occurs in both a directed fishery, which is covered under a species-specific management plan, and as bycatch in the multi-species groundfish fisheries.

The major target species vary amongst the fisheries in the subregion however consistent fisheries statistics are not available for individual species. Groundfish landings come from both directed fishing effort and as bycatch in the shrimp fisheries of the subregion.

Croakers and weakfish

Acoupa weakfish (grey snapper)

Scienidae

Cynoscion acoupa

Green weakfish

Cynoscion virescens

Jamaica weakfish

Cynoscion jamaicensis

King weakfish (bangamary)

Macrodon ancylodon

Smalleye croaker (butterfish)

Nebris microps

Whitemouth croaker

Micropogonias furnieri

Catfishes

Ariidae

Catfishes

e.g. Arius spp.

Gillbacker sea catfish

Sciades parkeri

Snappers

Lutjanidae

Grey snapper

Lutjanus griseus

Lane snapper

Lutjanus synagris

Southern red snapper

Lutjanus purpureus

Vermilion snapper

Rhomboplites aurorubens

Other species

Barracuda

Sphyreana spp.

Grunts

Haemulidae

Largehead hairtail

Trichiurus lepturus

Mackerel

Scomberomorus spp.

Description of the Fishery

Industrial Fisheries

Fish trawlers are the major type of industrial groundfish fisheries in the region with limited catches coming from hook and line (handline and longline) fisheries.

Groundfish bycatch from industrial shrimp trawlers, including seabob trawlers, makes up the greatest fraction of the industrial groundfish landings. In the subregional shrimp fisheries the finfish landings exceed the shrimp landings by a factor of 2 to 4, and when discarded bycatch is considered the bycatch volumes may be close to 10 times the shrimp landings. Depending on areas fished this bycatch may include large proportions of juvenile groundfish which are discarded. The numbers of industrial shrimp trawlers have declined in all the countries involved as a result of both declining profitability and management policy.

Artisanal Fisheries

Artisanal fisheries include trawlers, seines (Chinese seine and pin seine), hook and line, and gillnet vessels. In all cases these are smaller vessels, e.g. in Trinidad they are defined as <36 feet in length and < 180 horsepower. Gear handling is non-mechanised.

Statistical data from FAO and other sources are incomplete for this group and directed catches and bycatches from the shrimp trawl fisheries are not reliably separated.

	2000-2015	2016	2017	
Brazil				
French Guiana		2483	2130	Incomplete, Small-scale only
Guyana	17,500*			*Avg. for 2014-2017 directed and bycatch
Suriname				Incl. ~1000 t Lane snapper
Trinidad and Tobago				
Venezuela				
Total				

Governance

The multilateral institutional arrangements governing this fishery are described in the main body of the FMP. Of specific relevance has been the various formulations of the Shrimp and Groundfish Working Group that have provided scientific and management advice for this fishery since the 1990s.

The international or regional policies and legislation bearing on this plan and the relevant national legislation, policies and management plans for marine fisheries are described in the main body of the FMP.

Description of Process Leading to the Plan

This Sub-regional Groundfish FMP has been developed through a process of national consultations and extraction from national plans. Existing national FMPs covering shrimp address known issues and concerns. National plans in each case included stakeholder consultations for draft preparation and then in a review of the proposed plan.

In Guyana, the draft plan was prepared by the Fisheries Department and reviewed by stakeholders in public validation workshops. The draft plan was also reviewed by the Fisheries Advisory Committee prior to being submitted for Ministerial approval.

In Suriname the current plan was formulated for the period 2014-2018. A revised plan for 2019-2023 is nearing completion. Review by the Fisheries Advisory Committee will follow

and make recommendation to the Minister. Plan provisions discussed herein refer to the 2014-2018 plan.

In Trinidad specific measures to regulate the trawl fishery were implemented by Cabinet Order in 2013. A draft Management Plan for the Shrimp Fishery was developed in 2014 based on stakeholder consultations and a report and recommendations submitted by a multi-sectoral stakeholder committee. The current draft plan includes measures to address groundfish as bycatch in the shrimp trawl fishery but no explicit management related to groundfish directed fishing.

Stakeholder consultations were held in Guyana, Suriname, and Trinidad and Tobago to focus on the requirements of a sub-regional EAF management plan. Preliminary presentations provided background on the EAF in general and the present process in the Caribbean under the CLME+ project. Consultations on issues followed an open format, allowing stakeholders to raise issues as desired as well as considering a pre-determined range of issues put forward by the Fisheries Department and consultants.

Goals and Objectives

The national plans of Guyana, Suriname and Trinidad and Tobago each specify objectives for the fisheries sector overall however there are no additional objectives specific to the groundfish fisheries specified in the national management plans.

Improved data collection and catch monitoring with emphasis on species and size composition of the groundfish catches is required. Each national plan should address this for both directed catches and shrimp trawl bycatches, including species and size composition of discarded groundfish catches.

Management issues and problems

Data collection, stock assessment and stakeholder access to management information

Management units and stock structure

Registration and licensing of all vessels, esp. artisanal

Bycatch including turtles

Declining catch rates and abundance for key species

Mixed species fishery and more vulnerable species may be being severely overfished.

Activities

There are a number of existing management measures specified in shrimp or seabob National FMPs which are specifically related to the groundfish bycatch in those fisheries. These include fishing effort controls, mesh sizes and the required use of bycatch reduction devices. Requirements for data collection from the logbooks and landing records for shrimp include provisions for recording bycatch and discards however there are limited data actually available in this regard.

Guianas Brazil Regional Fisheries Management Plan -- Groundfish

	Guyana	Suriname	Trinidad and Tobago
Effort		Number of licenses limited – Large sea shrimp to 25 vessels and Deep-sea shrimp to 4 vessels, maximum 500 hp Increases in licenses will require stock assessment evidence that stocks have been adequately rebuilt	Authorization of fishing vessels to fish on the high seas
Technical measures	BRD and TED required	BRD and TED required	TED required, BRDs to be required
	VMS required	VMS required	VMS to be required
		Area/depth restriction, >15 fm, or >45 fm for Deep-sea license	Area restrictions on trawlers; Off south coast >2 n.mi. from shore, in Gulf of Paria allowed zones are defined for differing classes of trawlers
		Mesh size minimum 45 mm	Minimum mesh size of 75 mm to be used in the cod-ends of fish trawl nets
Information	Catch and effort recorded in logbooks, Last haul programme for size sampling	Landing reported (Artisanal) Logbook (Industrial)	Improved trip reporting system for non-artisanal vessels – move to logbook system
	Fishers are registered and licensed	Fishing vessels are registered with MAS and licensed by Fisheries Department	Record of Fishing Vessels, complete vessel census
	Export licenses required from Fisheries Department	Mandatory landings in Suriname	Stakeholder engagement and consultation in the management decision-making process

Harmonised activities to address groundfish management across the subregion are below.

	Subregional harmonised activities
Effort	Sea days limit regulated by HCR based on joint stock assessment and total fishing effort, i.e. total vessel-days and not days/vessel
	Closed season based on catch composition including groundfish bycatch (e.g. juveniles and undersized groundfish)

	Subregional harmonised activities
	Vessel numbers limit per country and maximum horsepower for groundfish-directed fisheries including artisanal sector
Technical measures	BRD and TED required for all trawlers
	VMS required
	Area/depth restriction to be made consistent, particularly in the marine boundary area between Guyana and Suriname
	Gear mesh sizes and other regulations to be consistent
Information	Catch, effort and size composition data collected to joint standards
	Bycatch quantity and composition data collected to joint standards
	Fishers are registered and licensed
	Fishing vessels are registered and licensed
	Export licenses required from Fisheries Department

Decision Rules and Procedures

None of the countries involved have specified harvest control rules in the existing management plans for groundfish fisheries. The need for a regional assessments and corresponding regional management plan is specifically reflected in the Guyana plan and well understood across the countries involved.

Because of the significant groundfish bycatch in the shrimp and seabob fisheries any future harvest control rules under this plan must address effort in those fisheries as well.

Monitoring and Evaluation

Review

At this time the only body acting at the sub-regional scale is the WECAFC/ CRFM/ IFREMER Working Group on Shrimp and Groundfish in the Northern Brazil-Guianas Shelf. It is recommended that this working group undertake the regular (period to be determined) review of the sub-regional plan

Communication Strategy

Fill in

Southern red snapper sub-regional fisheries management plan

The Southern red snapper (*Lutjanus purpureus*) is a large and valuable species in the Lutjanidae family. They are distributed throughout the NBSLME in rocky or clean sand areas rather than muddy or soft bottoms, and are generally found in deeper shelf waters. There may be more than one stock within the subregion; in particular the stock in Brazil's waters may be separate from those in the rest of the subregion. *L. purpureus* is closely related to, and may be conspecific with *L. campechanus*, the Northern red snapper.

Description of the Fishery

The directed red snapper fisheries in the North Brazil Shelf LME mostly use hook and line gears (handline and longline). Most of the red snapper directed effort is by Venezuelan boats operating along the shelf from Venezuela to northern Brazil. They operate under license in the waters of Suriname and French Guiana although illegal fishing i.e. unlicensed, by Venezuela boats is reported from both these countries as well as elsewhere in the NBSLME.

The species is also a minor bycatch in the both shrimp and groundfish trawl fisheries.

Bycatch species include:

Lane snapper	<i>Lutjanus synagris</i>
Vermilion snapper	<i>Rhomboplites aurorubens</i>
Groupers	<i>Serranidae – Epinephelus spp.</i>

Statistical data from FAO and other sources are incomplete for this group and where catches are estimated, the Southern red snapper landings cannot be separated from other Lutjanids.

	2000-2015	2016	2017	
Brazil	6143	6100	6000	FAO FIGIS
French Guiana*	1200	1248	1713	
Guyana	840	814	950	FAO FIGIS
Suriname*	1200-1400			No separate data
Trinidad and Tobago**	~ 2000			All snappers combined
Venezuela				taken in Suriname and French Guiana
Total				

* estimates taken from Mendoza 2015 for Venezuela boat catches in each country for 2000-2010

** estimates taken from Mohammed and Lindop 2015 for 2000-2010

Governance

The multilateral institutional arrangements governing this fishery are described in the main body of the FMP. Of specific relevance has been the various formulations of the Shrimp and Groundfish Working Group that have provided scientific and management advice for this fishery since the 1990s.

The international or regional policies and legislation bearing on this plan and the relevant national legislation, policies and management plans for marine fisheries are described in the main body of the FMP.

Description of Process Leading to the Plan

This Sub-regional Red snapper FMP has been developed through a process of national consultations and extraction from national plans. Existing national FMPs cover red snapper in the general objectives and activities but there are no species-specific national plans for it. National plans in each case included stakeholder consultations for draft preparation and then in a review of the proposed plan.

In Guyana, the draft plan was prepared by the Fisheries Department and reviewed by stakeholders in public validation workshops. The draft plan was also reviewed by the Fisheries Advisory Committee prior to being submitted for Ministerial approval.

In Suriname the current plan was formulated for the period 2014-2018. A revised plan for 2019-2023 is nearing completion. Review by the Fisheries Advisory Committee will follow and make recommendation to the Minister. Plan provisions discussed herein refer to the 2014-2018 plan.

In Trinidad specific measures to regulate the trawl fishery were implemented by Cabinet Order in 2013. A draft Management Plan for the Shrimp Fishery was developed in 2014 based on stakeholder consultations and a report and recommendations submitted by a multi-sectoral stakeholder committee. The current draft FMP is specific to the shrimp trawl fisheries and does not address red snapper fisheries, either specifically or in the general provisions.

Stakeholder consultations were held in Guyana, Suriname, and Trinidad and Tobago to focus on the requirements of a sub-regional EAF management plan. Preliminary presentations provided background on the EAF in general and the present process in the Caribbean under the CLME+ project. Consultations on issues followed an open format, allowing stakeholders to raise issues as desired as well as considering a pre-determined range of issues put forward by the Fisheries Department and consultants.

Goals and Objectives

The national plans of Guyana, Suriname and Trinidad and Tobago each specify objectives for the fisheries sector overall but only Suriname has included specific management objectives for red snapper. In the case of Suriname, the red snapper fishery is conducted by boats from Venezuela, continuing a fishery that had operated prior to extension of Suriname’s jurisdiction in 1978.

Red snapper specific objectives		
Guyana	Suriname	Trinidad and Tobago
	Renew the expired fisheries agreement with Venezuela regulating the red snapper fishery	

	Blacklist vessels caught fishing without a license per the proposed IUU fishing rules.	
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Management issues and problems

Management units and stock structure

Data collection, stock assessment and stakeholder access to management information

Registration and licensing of all vessels, esp. artisanal

Bycatch of snappers in trawl fisheries

Landings being made out of catch jurisdiction

IUU fishing by unlicensed vessels (Venezuelan).

Activities

Existing management measures in place in National FMPs have little bearing on red-snapper specific fisheries. Bycatch of this species in shrimp fisheries is minor and catches are predominantly from hook and line fisheries conducted by vessels from Venezuela.

Harmonised activities to address red snapper management across the subregion are below.

	Subregional harmonised activities
Effort	Sea days limit regulated by HCR based on joint stock assessment and total fishing effort, i.e. total vessel·days and not days/vessel
	Closed season based on catch composition
	Vessel numbers limit per country and maximum horsepower for red snapper-directed fisheries including artisanal sector
	Ensure Fishing Agreements are in place governing registration and licensing of foreign and sub-regional vessels for red snapper access, i.e. Venezuela boats
Technical measures	VMS required
	Gear hook sizes and other regulations to be consistent
	Catch, effort and size composition data collected to joint standards
	Bycatch quantity and composition data collected to joint standards
Information	Fishers are registered and licensed
	Fishing vessels are registered and licensed
	IUU fishing vessels are tracked and sub-regional register is maintained
	Stock assessment and stock structure studies conducted

Decision Rules and Procedures

None of the countries involved have specified harvest control rules in the existing management plans for red snapper fisheries.

Monitoring and Evaluation

Review

At this time the only body acting at the sub-regional scale is the WECAFC/ CRFM/ IFREMER Working Group on Shrimp and Groundfish in the Northern Brazil-Guianas Shelf. It is recommended that this working group undertake the regular (period to be determined) review of the sub-regional plan

Communication Strategy

Fill in