



Vottunarstofan Tún ehf.

Sustainable Fisheries Scheme

Marine Stewardship Council Fisheries Assessment

Guyana Seabob Fishery

Surveillance Report

Report on the 3rd surveillance of the fishery

Conformity Assessment Body	Vottunarstofan Tún ehf.
Assessment Team	Rod Cappell (team leader), Julian Addison
Fishery Client	GATOSP
Assessment Type	Third Surveillance
Author	Julian Addison, Rod Cappell (ed.)
Report Date	February 2023

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Glossary

B _{MSY}	Biomass corresponding to the maximum sustainable yield
CAB	Conformity Assessment Body
CAP	Client Action Plan
CPUE	Catch per Unit Effort
CRFM	Caribbean Regional Fisheries Mechanism
DAS	Days at sea
EEZ	Exclusive Economic Zone
eNGO	(Environmental) Non-Governmental Organisation
ETP	Endangered, threatened and protected
F _{MSY}	Fishing mortality giving maximum sustainable yield
FAO	Food and Agriculture Organisation
GATOSP	Guyana Association of Trawler Owners and Seafood Processors
HCR	Harvest Control Rule
IUU	Illegal, unreported and unregulated (fishing)
LRP	Limit Reference Point
MCMC	Markov Chain Monte Carlo
MCS	Monitoring, Control and Surveillance
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
NOAA	(US) National Oceanic and Atmospheric Administration
NPOA	National Plan of Action
NTZE	No Trawl Zone Entry
PCR	Public Certification Report
PHSM	(WHO) Public health and social measures
PI	Performance indicator
PSA	Productivity Susceptibility Analysis
RBF	Risk based framework
SG	Scoring guidepost
SOP	Standard operating procedure
SSB	Spawning stock biomass
SWG	Seabob Working Group
t	tonnes
TAC	Total Allowable Catch
TED	Turtle excluder device
TOR	Terms of reference
TRP	Target Reference Point
UoA	Unit of Assessment

UoC	Unit of Certification
VMS	Vessel Monitoring System
WHO	World Health Organisation
WWF	World Wide Fund for Nature

Executive Summary

- This report presents the results of a surveillance audit of Guyana Seabob fishery as required by the Marine Stewardship Council's (MSC) Fisheries Standard.
- The Guyana Seabob fishery was first certified in August 2019 for a 5-year period. However, as a result of the Covid 19 global pandemic, MSC have issued a derogation for all certified fisheries, which extends certificates and all associated deadlines (i.e. condition milestones) by 6 months. The certificate is now due to expire in February 2025.
- The surveillance and subsequent reporting were carried out by an assessment team from Vottunarstofan Tún, an accredited Conformity Assessment Body (CAB), on behalf of the client fishery of The Guyana Association of Trawler Owners and Seafood Processors (GATOSP).
- The report provides an account of the surveillance process undertaken and provides a description of any relevant changes in the fishery since the time of certification. The report is not intended to follow standard editing norm of scientific journals, but instead follows a normative surveillance reporting template which aims to highlight all details of relevance to the audit.
- The assessment was conducted by a team of the following experts:
 - Rod Cappell: Team leader and P3 assessor;
 - Julian Addison: P1, P2 and application of RBF;
- Gunnar Á. Gunnarsson served as assessment secretary on behalf of Vottunarstofan Tún.
- This 3rd annual surveillance audit was carried out remotely (i.e. off-site) on December 5th 2022 with the use of video conference call facility.
- Meetings were held with members of the client group; key personnel from the management authority; and representatives of the marine eNGO community.
- All stakeholders, pre-identified by V Tún's stakeholders registry for this fishery, were notified about the surveillance via e-mail and given the opportunity to submit a request for a meeting or written comment. No such submissions were received.
- The purpose of the surveillance audit is set out in the MSC Fisheries Certification Process (v2.2), including a requirement to update any changes in the fishery or management system in the preceding 12 months (or since the last assessment or surveillance report) and to provide an update on progress against conditions.
- No changes to gear and fishing operations were reported. Covid resulted in some market disruption, but continued fuel supply issues meant lower fishing activity overall.
- Observer schemes were somewhat disrupted due to insurance and staffing issues. The control authorities check the fishing activity with VMS monitoring and this resulted in a 14-day suspension of the fishery in response to non-compliance of vessels in relation to the new 8-fathom fishing limit.
- A new Harvest Control Rule (HCR) was developed and implemented from May 2021. Although the main stock indicator dropped below the trigger reference point at the end of 2021, the Fisheries Department concluded that there were exceptional circumstances due to very high rainfall underlying the decline in the stock indicator, and that it was not necessary to trigger reductions in fishing effort until data for January 2022 were available. The Fisheries Division's conclusion was confirmed when the main stock indicator increased in January 2022 to above

the target reference point and remained at a high level throughout the fishing season confirming that the stock is at a high level.

- In terms of regulations, the trawl limit was extended into deeper water from the 7 fathom line to the 8 fathom line. Moving the fishery further offshore has reduced the potential for conflict with artisanal fishers and reduced interactions with ETP species. The management plan for seabob and the general fisheries management plan were finalised and approved in 2022 by the Minister and came into effect October 2022.
- No changes were identified that would change the traceability risk of non-certified product entering the Chain of Custody.
- In terms of progress against conditions, Condition 1 and Condition 6 were both 'closed' at the 1st annual surveillance. However, in the case of peer review of stock assessment a further 'Recommendation' was added in last year's surveillance and this was conducted.
- Condition 2 on the impact of the UoA on main secondary species was concluded to be behind target.
- Some progress had been made in relation to Conditions 3 and 4 on interactions of the UoA with ETP species. However under MSC Derogation 6, there is no requirement to formally evaluate progress against these conditions this year and revised milestones were provided by the audit team.
- Condition 5 on control and enforcement was concluded to be nominally 'on-target'. However, under MSC Derogation 6, there is no requirement to formally evaluate progress against this condition this year and revised milestones were provided by the audit team.
- Condition 7, introduced at first surveillance in relation to the need to replace VMS units, is concluded to be 'CLOSED as the new VMS service is now fully operational across all vessels and PI 3.2.3 has been re-scored.
- The client fishery remains aware of the 5 non-binding recommendations and any progress in relation to these is reported below.
- At the conclusion of the 3rd surveillance audit of the Guyana Seabob fishery, Vottunarstofan Tún confirms that the fishery continues to meet the MSC standard and its certification should continue.

1 Report details

1.1 Surveillance Information

Table 1 Surveillance announcement

1	Fishery name																	
	Guyana seabob																	
2	Unit of Assessment (UoA)																	
	<table border="1"> <tr> <td colspan="2" style="background-color: #d3d3d3;">Guyana seabob fishery: Unit of Assessment</td> </tr> <tr> <td style="background-color: #d3d3d3;">Species</td> <td>Seabob (<i>Xiphopenaeus kroyeri</i>)</td> </tr> <tr> <td style="background-color: #d3d3d3;">Fish stock</td> <td>Guyanese EEZ Seabob (<i>Xiphopenaeus kroyeri</i>)</td> </tr> <tr> <td style="background-color: #d3d3d3;">Location of Fishery</td> <td>FAO Statistical Area 31 (Western Central Atlantic); Guyana Exclusive Economic Zone, 8-18 fathoms</td> </tr> <tr> <td style="background-color: #d3d3d3;">Management</td> <td>Managed by the Guyana Fisheries Department (with input from the Seabob Working Group). Fleet management by Guyana Association of Trawler Owners and Seafood Processors (GATOSP).</td> </tr> <tr> <td style="background-color: #d3d3d3;">Fishing Methods</td> <td>Shrimp Demersal Trawl</td> </tr> <tr> <td style="background-color: #d3d3d3;">Client Group/ Fishery Practices</td> <td>All Guyanese, commercially licenced, demersal shrimp trawl vessels, licenced to participate in the Guyanese Seabob Fishery. Vessel operations and gear specifications as set out in the Fishing Act (2002), the Fisheries Regulations (2018) and the Seabob Management Plan.</td> </tr> <tr> <td style="background-color: #d3d3d3;">Other eligible fishers</td> <td>None</td> </tr> </table>		Guyana seabob fishery: Unit of Assessment		Species	Seabob (<i>Xiphopenaeus kroyeri</i>)	Fish stock	Guyanese EEZ Seabob (<i>Xiphopenaeus kroyeri</i>)	Location of Fishery	FAO Statistical Area 31 (Western Central Atlantic); Guyana Exclusive Economic Zone, 8-18 fathoms	Management	Managed by the Guyana Fisheries Department (with input from the Seabob Working Group). Fleet management by Guyana Association of Trawler Owners and Seafood Processors (GATOSP).	Fishing Methods	Shrimp Demersal Trawl	Client Group/ Fishery Practices	All Guyanese, commercially licenced, demersal shrimp trawl vessels, licenced to participate in the Guyanese Seabob Fishery. Vessel operations and gear specifications as set out in the Fishing Act (2002), the Fisheries Regulations (2018) and the Seabob Management Plan.	Other eligible fishers	None
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3	Date certified	Date of expiry																
	2019-08-06	2025-02-05																
4	Surveillance level and type																	
	Originally surveillance level 4 but changed to surveillance level 3. This is justified by a provision in article 1.3.a of derogation 3, CAB's policy on remote auditing, the currently high WHO's PHSM severity index of covid restrictions in the client country and good ability to effectively apply remote auditing techniques to conduct interviews and facilitate information sharing. It is the view of the CAB and the team that the ability to verify remotely the status and progress of conditions and recommendations, as well as to engage remotely in stakeholder consultation is high. The surveillance was therefore conducted off-site.																	
5	Surveillance number																	

	1st Surveillance	
	2nd Surveillance	
	3rd Surveillance	X
	4th Surveillance	
	Other (expedited etc)	
6	Surveillance team leader	
	<p>Rod Cappell Team Leader, also with responsibility for Principle 3 assessment.</p> <p>Rod Cappell holds a degree in Marine Biology, a Master’s degree in Marine Resource Development & Protection and a post-graduate qualification in Environmental Economics. He has been a director of the specialist fisheries consultancy, Poseidon, for over 15 years providing fisheries management and policy research services after working for several years as an environmental consultant.</p> <p>Rod has been involved in more than 25 MSC full assessments and re-assessments throughout Europe, Iceland, Greenland & Chile as well as undertaking numerous surveillance audits and pre-assessments. These have included assessments of demersal, pelagic and shellfish species and complex multi-species and multi-gear assessments. Rod also provides technical support to Fishery Improvement Projects in the UK, China and France.</p> <p>Rod has passed MSC training and meets all Fishery TL Qualification and Competency Criteria.</p> <p>Vottunastofan Tún confirms that Rod Cappell meets the qualification and competency criteria under MSC FCP v2.2 Table PC1 and MSC GCR v2.4.1 Table 1, in particular:</p> <ul style="list-style-type: none"> - has university degrees in marine biology and environmental economics; - has over five years’ experience in the fisheries sector related to the tasks under his responsibility; - has passed MSC team leader and team member training; - has undertaken two MSC fishery assessments or surveillance audits as team leader/member in the last 5 years; - has the experience in applying different types of interviewing and facilitation techniques and the ability to effectively communicate with the client and other stakeholders. <p>Rod has completed an Exemplar Global training course Lead Auditor – Management Systems Auditing, with the qualification Exemplar Global AU – Auditing Management Systems ISO 19011:2018 and Exemplar Global TL – Leading MS Audit Teams ISO 19011:2018.</p> <p>Vottunastofan Tún confirms that Rod Cappell has no conflict of interest in relation to the Guyana seabob fishery.</p>	
7	Surveillance team members	
	<p>Julian Addison: Team member, Principle 1 and 2</p> <p>Dr Julian Addison is an independent fisheries consultant with over 30 years’ experience of stock assessment and provision of management advice on shellfish fisheries, and a</p>	

background of scientific research on shellfish biology and population dynamics and inshore fisheries. Until December 2010 he worked at the Centre for Environment, Fisheries and Aquaculture Science (Cefas) in Lowestoft, England where he was Senior Shellfish Advisor to Government policy makers, which involved working closely with marine managers, legislators and stakeholders, Government Statutory Nature Conservation Organisations and environmental NGOs. He has also worked as a visiting scientist at DFO in Halifax, Nova Scotia and at NMFS in Woods Hole, Massachusetts where he experienced shellfish management approaches in North America. For four years he was a member of the Scientific Committee and the UK delegation to the International Whaling Commission providing scientific advice to the UK Commissioner. He has worked extensively with ICES and most recently was Chair of the Working Group on the Biology and Life History of Crabs, a member of the Working Group on Crangon Fisheries and Life History and a member of the Steering Group on Ecosystems Function. He has extensive experience of the MSC certification process primarily as a P1 team member but also as a P2 team member and team leader. He has undertaken over 40 MSC full assessments of crustacean and mollusc fisheries worldwide which use a wide range of stock assessment methodologies and fishing gears. He has also undertaken MSC pre-assessments in Europe, North America and Australia and over 100 annual surveillance audits and technical reviews. He is a member of the MSC Peer Review College and has carried out peer reviews of MSC assessments worldwide of a wide range of fish and shellfish fisheries. Other recent work includes a review of the stock assessment model for blue crabs in Chesapeake Bay, USA, and an assessment of three Alaskan crab fisheries under the FAO-based Responsible Fisheries Management scheme.

Vottunarfstan Tún confirms that Dr. Addison meets the fishery team member qualification and competency criteria specified in Annex PC2, Table PC2 of FCP v2.2, in particular:

- has a university degree (Ph.D.) in Population Dynamics;
- has over five years' experience in the fisheries sector related to the tasks under his responsibility;
- has passed MSC team leader/member training;
- has undertaken 2 MSC fishery assessments or surveillance site visits as team member in the last 5 years;
- has the experience in applying different types of interviewing and facilitation techniques and the ability to effectively communicate with the client and other stakeholders.

Julian has completed an Exemplar Global training course Lead Auditor – Management Systems Auditing, with the qualification Exemplar Global AU – Auditing Management Systems ISO 19011:2018 and Exemplar Global TL – Leading MS Audit Teams ISO 19011:2018.

Furthermore, Julian has the qualifications and competencies required for serving as an assessor as outlined in Annex PC3, Table PC3 of FCP v2.2.

Vottunarfstan Tún confirms that Dr. Julian Addison has no conflicts of interest in relation to the Guyana seabob fishery.

Current knowledge of the country, language, local fishery context, RBF and remote auditing

Julian Addison was a member of the team that conducted the initial assessment of the Guyana seabob fishery completed in 2019. He was also a member of the team conducting the first and the second surveillance audits. Rod Cappell led the second surveillance audit of the fishery.

	<p>The meetings and interviews were conducted in English which is the official language of Guyana and is spoken and understood among client staff and stakeholders. Language difficulties are therefore not expected during client and stakeholder consultation meetings.</p> <p>Julian Addison and Rod Cappell have completed the 2018 version of the traceability module of MSC’s online training and Julian has also completed the 2020 version.</p> <p>Both members of the team have in the last five years completed the Risk Based Framework (RBF) module of MSC online training.</p> <p>The assessors are experienced in remote auditing of fisheries. Julian Addison and Rod Cappell have also completed remote auditing module of MSC online training.</p> <p>Full CVs of the team leader and the team members are available upon request.</p>
	<p>The initial assessment as well as the first and second surveillance were conducted by a team of three assessors, one of which had to withdraw due to other commitments prior to this notification. The remaining two assessors combined meet the qualification and competency criteria required for this surveillance.</p>
8	Audit/review time and location
	<p>This was an off-site surveillance that was conducted on 5-6 December 2022 by means of video conference calls with the Client and relevant stakeholders. Information relevant to this fishery, including its management and progress towards meeting open conditions and recommendations, were collected in the run-up to and during the dates of the surveillance.</p> <p>The surveillance was timed four months after the third anniversary of the fishery’s certificate. The timing is still well within the timeframe allowed for by MSC’s FCP, 7.28.8.1.</p> <p>Since the certificate of this fishery was extended by six months the timing serves to gradually even the length between each of the four surveillance audits scheduled for the current certificate cycle.</p>
9	Assessment and review activities
	<p>The surveillance audit team actively engaged with the client and stakeholders to review the following:</p> <ul style="list-style-type: none"> - any potential or actual changes to the fishery and its management systems; - any changes to, deletion or introduction of, law and regulations affecting the fishery; - any changes in personnel in industry, science or management and their potential impact on the management of the fishery; - any changes to scientific information, including stock assessments; - any changes to its traceability systems; - any changes affecting harmonisation of overlapping fisheries – and – - the fishery’s progress against open conditions and recommendations.
10	Stakeholder opportunities

Vottunarstofan Tún invited stakeholders to provide any information considered relevant to the surveillance of the Guyana seabob fishery.

Stakeholders were invited to provide input at any time and to request to meet remotely with audit team members during the surveillance audit.

Stakeholders wishing to submit written information or request a meeting with members of the assessment team were asked to send their request to the Tún contact below **by 17.00 GMT on 15 November 2022**, providing the following information:

- (1) their name and contact details,
- (2) their association with the assessed fishery and
- (3) the issues that they wish to discuss.

Information about the Guyana seabob fishery assessment is available for review on MSC's website, <https://fisheries.msc.org/en/fisheries/guyana-seabob/@assessments>.

Stakeholders were asked to use *MSC Template for Stakeholder Input into Surveillance Audits v1.0* for the submission of any comments (available on MSC's website, <https://www.msc.org/for-business/certification-bodies/supporting-documents> or upon request from Tún).

Stakeholders were asked to send any enquiries, requests for meeting or other information to the following:

Vottunarstofan Tún ehf.
Email: tun@tun.is

1.2 Background

1.2.1 Changes to the Management

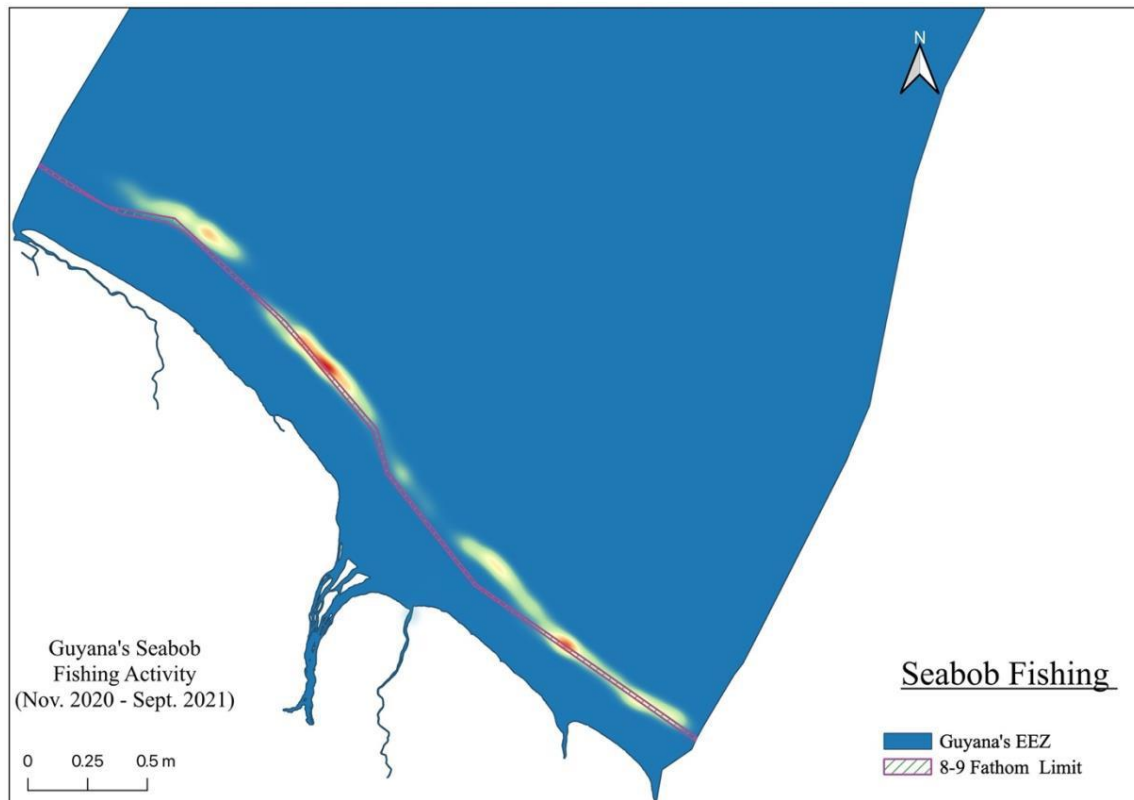
No changes to gear and fishing operations were reported. The continued issue over fuel supply and prices meant that less fishing activity occurred in the 2021/2022 season. Following Covid disruptions in the previous season, the observer scheme was further disrupted due to insurance and staffing issues.

The control authorities monitoring the fishery with VMS monitoring and coastal inspections identified non-compliance of vessels in relation to the 8-fathom inshore limit. This resulted in a 14-day suspension of all fishing activities. All companies were notified of the extent and reason for the closure, warning that future breaches would result in full suspension of licenses for the individual vessels concerned. The authorities report no other compliance issues.

A Captain training event was conducted in October 2022. The training focused on sustainable fisheries management in the seabob fisheries.

The VMS system, resulting in a new condition, was reported by all stakeholders to be functioning well and VMS maps of Seabob fleet fishing activity were provided to the surveillance team.

Figure 1 Seabob fishery activity within the Guyanan EEZ (source: Fisheries Department, 2021)



The contentious licensing of two new vessels by the Fisheries Minister for 2020/21 did not ultimately affect the fishery as those vessels did not operate in the fishery and Seabob buyers stated they would not receive product from these vessel operators.

The Fisheries department officials were asked about evidence of any labour issues within the fishery. They stated that a different ministry deals with social/labour issues, but no issues regarding forced labour in the fishery had been reported.

Tragically one vessel sank in January, killing 3 fishers.

1.2.2 Changes to relevant regulations

2022 saw the finalisation and ministerial approval of:

- Guyana Seabob Management Plan 2022-2026 (GATOSP, 2022)
- Guyana's Marine Fisheries Management Plan 2022-2027 (Gov. of Guyana, 2022)

Changes in the plan include formalizing the ecosystem-based approach to fisheries; increased MCS, greater regional collaboration; improving data collection; combatting IUU fishing and reducing ecosystem impacts.

A Guyanan IUU Plan of Action has also been drafted with the purpose and scope stated as (Bumbury, 2022):

- 1) to state Guyana's plan of action to prevent, deter, and eliminate IUU fishing;
- 2) to provide a status report on the nature and extent of IUU fishing with respect to Guyana;

- 3) to provide an account of the current policies and legislation relating to this problem; and
- 4) to identify ongoing strategies and programmes to address it.

The proposed measures include:

- Develop a NPOA for sharks which will consider IUU activities, shark conservation and management
- Full implementation of VMS monitoring across all sectors
- Review and update relevant SOPs with the International Standards Organisation (ISO) standards for inspecting (ISO 17020) and auditing (ISO 9001:2015)
- Research to improve traditional MCS tools eg. use of QR codes on artisanal vessels and drones
- Expand MCS and enforcement to internal waters (Inland Fisheries)
- Increase the knowledge of the general public on IUU Fishing and their role in mitigating its effects.

There is also a draft Regulation on the Management of Marine Mammal Interactions with Guyana's Fisheries Sector.

1.2.3 Changes to personnel involved in science, management or industry

New Deputy Chief Fisheries Officer and Principal Fisheries Officer were appointed. Recruitment and retention of staff continue to be challenges for the Fisheries Department with the private sector (e.g. oil & gas developers) offering higher wages.

1.2.4 Changes to scientific base (P1 Stock status)

The harvest strategy for the seabob fishery is characterised by a restriction of fishing effort through a limited entry licensing scheme, measures to minimise bycatch, restrictions to fishing areas, the implementation of reference points and harvest control rules to safeguard against overfishing, and a rigorous monitoring, control and enforcement regime. There is no TAC for the seabob fishery.

Fishing effort is limited as there is a maximum limit of 87 vessels in the fishery. In addition, limits on days fishing per vessel is evaluated based on observed changes in the main stock status indicator for the seabob fishery - the catch per unit effort (CPUE) calculated as total landings of seabob processed (peeled tail) weight in kilograms divided by an index of fishing effort. Up until 2020, the index of fishing effort was the total number of standardised days-at-sea, and from 2020 onwards the index was the total number of nominal days-at-sea + 1. (The landed catch is recorded as weight of processed shrimp, representing about 43% of the live, green weight.) The key element of the harvest strategy is the harvest control rule (HCR) which states that if the CPUE for the whole fleet drops below agreed reference points, then the fishing companies are required to reduce the number of days fishing.

Stock assessment of the Guyana seabob is an integrated assessment that uses all available information in a single model to estimate the past stock dynamics and the current status for seabob (Medley, 2019a). The assessment consists of a population model that describes the dynamics, an observation model that calculates what would be the expected observed values of total catch, catch and effort and size composition derived from the population model and a likelihood model that links the observation model to the data (Medley, 2019a). The stock assessment model is a statistical catch-at-age model, implemented with the Stan software (mc-stan.org) in R. The model is based on a standard forward-projection design. The model has a one-month time step and males and females are treated separately. Growth is described by the von Bertalanffy growth equation, and length-weight parameters are estimated from a log-linear model of morphometric data. Nominal catch and effort

data from processors' landings data were used in the model. Catches were converted from unpeeled tail weight to processed tail weight for use in the assessment. Fishing effort was measured in days at sea but corrected for asymptotic trip length as there was clear evidence of diminishing catches on longer trips possibly due to increased travel time to grounds, poor weather restricting fishing or lower catch rates necessitating longer trips. The model uses a Beverton and Holt stock-recruitment relationship with a steepness parameter. The model calculates log-likelihood for each component (total catch, catch and effort, size composition by size and sex, average count per pound) and uses Markov Chain Monte Carlo (MCMC) simulations to investigate uncertainty. The assessment methodology and its implementation in both the Guyana and Suriname seabob fisheries has been thoroughly peer reviewed by the Continental Shelf Fisheries Working Group of the Caribbean Regional Fisheries Mechanism (CRFM).

Output from the revised assessment model (Medley, 2019b) using inputs agreed by the CRFM peer review showed that stock biomass has been fluctuating around or above B_{MSY} , there was no evidence that recruitment had been reduced significantly by fishing, and that fishing mortality had been fluctuating around or just below F_{MSY} . Sensitivity analysis showed that the model output was insensitive to growth rate, but there could be a significant change in stock status for the plausible range of natural mortality rate (M) estimates of 0.093 to 0.29 per month. The base case scenario used a value of $M = 0.2$ per month which was considered appropriate by the CRFM peer review. Details of the output from the stock assessment were provided in the report from the 1st annual surveillance audit report (Southall *et al.*, 2020). The client reported at this year's audit that the stock assessment has not been updated since the 1st surveillance audit.

In addition to a peer review of the stock assessment, CRFM meeting agreed a new harvest control rule (HCR) (CRFM, 2019). The HCR is based on observed changes in the main stock status indicator for the seabob fishery of CPUE (Catch per Unit Effort) (Fisheries Department, 2020). If the monthly CPUE for the whole fleet, calculated as total landings of seabob processed (peeled tail) weight in kilograms divided by the total number of nominal days-at-sea + 1, drops below agreed reference points, then the fishing companies are required to reduce the overall number of days fishing. The HCR index is calculated as a moving average of the catch rate (CPUE) each month. The maximum fishing effort is set for each quarter and vessels may use that fishing effort as they see fit during the quarter, but the maximum effort must not be exceeded in any quarter. Fishing effort must be reduced if the index drops below a trigger reference point and essentially effort must be reduced to zero if the index drops below a limit reference point. Evaluation of the robustness of the HCR showed that there is less than 2% chance that the HCR fails to reduce effort when the stock is overfished, and equally a very low probability that the HCR reduces effort when the stock is not overfished (Medley, 2019c).

The HCR was based upon a maximum of 87 vessels in the fishery. Based on the 2019 stock assessment results for the Guyana Seabob fishery (Medley, 2019b), the maximum fishing effort in line with Maximum Sustainable Yield (MSY) is 1872 nominal days-at-sea (DAS) per month. The HCR therefore sets a maximum quarterly effort quota for the Guyana Seabob Fisheries at 5,616 Days, i.e. 3 x 1,872 days. Any unused days in each month may be carried over to the next month, but unused days are not allowed to be carried over into the new quarter. This maximum fishing effort in line with MSY corresponds to a target reference point for the HCR index equal to 284.42. The trigger (0.8 x MSY) and limit (0.5 x MSY) reference points are set at 227.54 and 142.21, respectively. Full details of the HCR can be found in Fisheries Department (2020) and the most up-to-date comparisons of current catch rate data with the reference points is described in Fisheries Department (2022a).

If the index decreases below the trigger reference point, effort will be adjusted proportionally until the index recovers (Fisheries Department, 2020).

Full details of the HCR can be found in Fisheries Department (2020) and the most up-to-date comparisons of current catch rate data with the reference points is described in Fisheries Department (2022a).

Table 2. HCR Index values equivalent to the target reference point, trigger value and limit reference point. (Source: Fisheries Department, 2020)

Reference point	Index Value (kgs processed tail weight per Nominal day at sea)
Target Reference Point (TRP)	284.42
Trigger Point	227.54
Limit Reference Point (LRP)	142.21

At this 3rd surveillance audit, the Fisheries Department provided an update on the status of the stock in terms of observed catches and monthly CPUE data to identify whether the monthly HCR index had at any time dropped below the trigger or limit reference points set out above in Table 2.

Last year's surveillance audit reported that the HCR CPUE index for the first half of 2021 remained above the reference points. Monthly landings data, CPUE and HCR CPUE index provided by the Fisheries Department show that the HCR CPUE index was well below the trigger point in October to November 2021, but recovered significantly to be above the target reference point (equivalent to MSY) from January to August 2022, and then declined in September 2022 to just below the trigger point (Table 3; Figure 2). The audit team noted that there was a low level of fishing effort even in the closed season in October, and the Fisheries Department confirmed that this was 'test' fishing rather than commercial fishing as part of a programme to evaluate whether the closed season should be extended in future years.

Table 3. Monthly landings data, fishing effort in terms of nominal days-at-sea (DAS), monthly CPUE and HCR CPUE index for the period October 2021 to October 2022. (Source: Fisheries Department, 2022a)

INDUSTRIAL SEABOB CPUE - 2021 -2022					
Months	Processed Weight (KG)	Nominal Das + 1	Monthly CPUE	Monthly HCR CPUE	Overall CPUE
October	50,728	438	116	138	
November	159,521	943	169	161	
December	158,866	828	192	184	
January	303,561	743	409	352	
February	422,385	834	506	375	
March	535,102	1,051	509	476	
April	553,917	1,165	475	475	
May	461,907	1,235	374	399	
June	348,686	1,023	341	355	
July	215,929	795	272	293	
August	203,744	1,126	181	209	
September	Close season	Close season	Close season	Close season	
October	Close season	Close season	Close season	Close season	

	3,414,346	10,181			335
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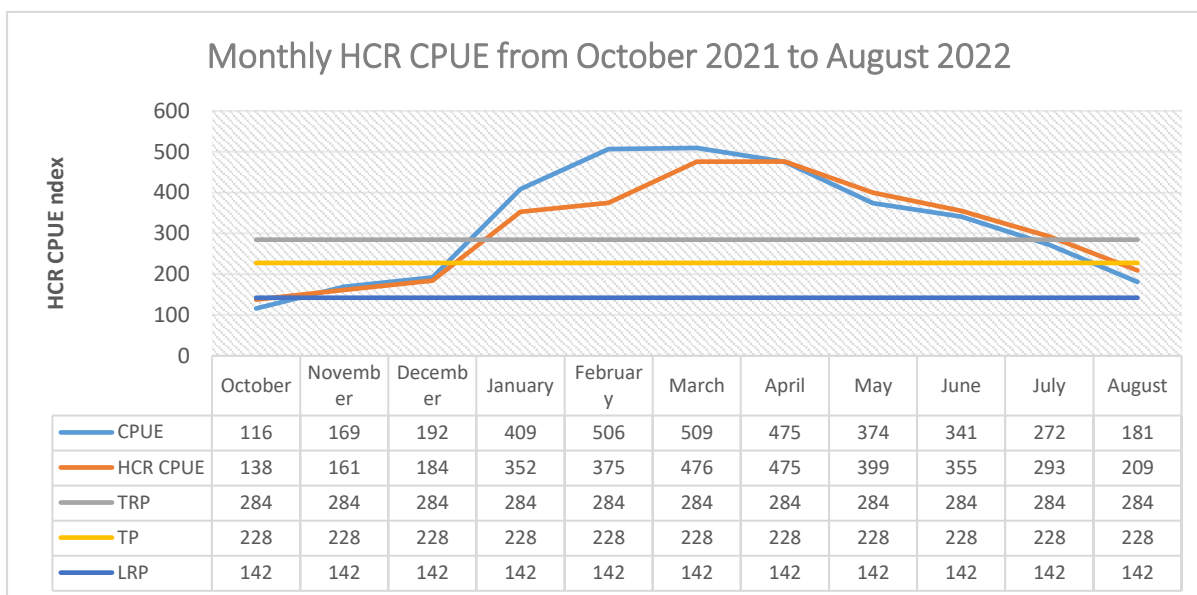


Figure 2. Observed CPUE (blue) and calculated HCR CPUE index (orange) for the period October 2021 to August 2022 in relation to the target (grey), trigger (yellow) and limit (dark blue) reference points. (Source: Fisheries Department, 2022a)

Under the HCR, the maximum quarterly effort quota for the Guyana seabob fishery of 5,616 days (3 x 1,872 days) must be reduced by the fishing companies if the HCR CPUE index drops below the trigger reference point of 228. The data presented in Table 3 and Figure 2 show that catch rates were very low in October to December 2021 following the closed season and this would normally trigger a significant reduction in the permitted monthly effort of 1,872 nominal days-at-sea. The Fisheries Department reviewed catch rates, information about environmental conditions and reports from the vessels during the period of October to December 2021, and concluded that catch rates were heavily influenced by high rainfall in this period which caused an increase in freshwater run-off into the shrimp habitat resulting in migration by shrimp out of the fishery area. On that basis, the Fisheries Department decided not to introduce restrictions on fishing effort and review the catch rate data in January 2022 before triggering any additional action. Due to low catch rates following the seasonal closure, two of the three companies stopped fishing anyway, so there was a significant reduction in fishing activity without the need for the Fisheries Department to invoke the HCR and implement mandatory effort reductions. The HCR CPUE index recovered to above both the target and trigger reference points in January 2022 and remained at a high level until July 2022 and so confirming the view of the Fisheries Department that no action was required to reduce fishing effort in November/December 2021.

Despite the low catch rates observed from October to December 2021, the overall assessment of stock status based upon the average CPUE value for the 2021/2022 season was 335 which is above the target reference point of 284. The audit team notes that whilst there has been no new stock assessment since last year's audit, the monthly data for 2021 to 2022 shows that for the majority of the year the HCR CPUE index has been well above the target reference point (Figure 2) which is considered equivalent to MSY. Furthermore, during the whole 2021/2022 fishing season monthly fishing effort did not exceed the upper limit of 1872 nominal days-at-sea allocated to the fishing companies.

The HCR CPUE index declined to below the trigger level in August 2022 just prior to the closed season, and in response the Fisheries Department under the Close Season protocol designated a closed season

from 30 August to 7 November 2022 which is longer than normal and was implemented to ensure that the stock makes a full recovery prior to the upcoming season.

Whilst CPUE is considered a good index of stock abundance and therefore an annual index of CPUE can be used to examine trends in stock abundance across years, the recent change in the fishing effort index to total number of nominal days-at-sea + 1 means that the current observed values of CPUE cannot be directly compared with values from previous years when the fishing effort index was standardised days-at-sea. The Fisheries Department therefore provided the audit team with catch and effort data for the 2021/22 season based upon the previous effort units of standardised days-at-sea. For the period October 2021 to September 2022, the overall CPUE was 503 kg / standardised DAS, which is slightly higher than that observed in 2020, but below the higher levels observed in previous years (Table 4).

Table 4. Annual CPUE (kg/sdas) for total industrial seabob fleet from 2016 to 2020. (Source: Jacobs, 2021)

Year	Catch (tonnes) (processed weight)	Annual CPUE (kg/sdas)
2016	8,210	664
2017	9,927	715
2018	8,704	678
2019	6,662	573
2020	4,200	485

Since last year' surveillance audit, the Fisheries Department has commissioned a peer review of the most recent stock assessment of the Guyana seabob fishery (Vargas, 2022). The peer review concluded that the stock assessment was robust and the use of the assessment for fishery decision-making was a validation of the approach. The peer reviewer considered that a major strength in this stock assessment was the use of Stan software which "provides a flexible probabilistic programming language for statistical modeling along with a suite of inference tools for fitting models that are robust, scalable, and efficient." The peer reviewer also highlighted the benefits of the most recent assessment of including improvements to the selectivity model and the interpretation of size classes. The peer reviewer made various recommendations for improving the approach including the collection of fishery-independent data, a re-evaluation of the measure of fishing effort, a greater understanding of catchability and therefore the relationship between CPUE and abundance and an improved estimate of natural mortality rate used in the model (Vargas, 2022).

As reported in previous surveillance audit reports, the Institute for Agricultural and Fisheries Research in Flanders (ILVO) initiated a PhD project in 2016 in cooperation with Ghent University and KU Leuven which involved using genetic studies to evaluate population structure of the seabob shrimp in the Guianan Ecoregion. The results from the project were published recently in a PhD thesis (Kerkhove, 2020). The study characterised and developed 14 novel polymorphic microsatellite markers for seabob (Kerkhove *et al.*, 2019b) and used these markers to investigate the genetic population structure of seabob with a focus on the three countries of the Guianan Ecoregion: Guyana, Suriname and French Guiana and included two sites from outside the Guianan Ecoregion, one in Colombia and one in Trinidad and Tobago. The study found low population genetic structure within the Guianan Ecoregion, but a high population differentiation between the Guianan Ecoregion and Colombia and Trinidad. Kerkhove (2020) concluded that the Guianan Ecoregion represents one single genetic population of seabob, that differs from the population in Trinidad and Colombia, and that given the similar ecological

and oceanographical characteristics of the entire Guianan Ecoregion, it is likely that this genetic population structure is also reflected in the regional population structure. (The audit team notes that these conclusions from the Kerkhove’s PhD thesis have not been published in a peer-reviewed journal). The Assessment Team for the recently recertified Suriname seabob fishery considered the implications for there being only a single stock of seabob across both the Suriname and Guyana fisheries (there is only a small artisanal fishery in French Guiana) and recognised that for many fisheries there is not always a direct overlap of the genetic stock with the assessment and management regime. Stocks are often assessed and managed in a pragmatic way even though the fishery may be exploiting only part of the stock, or in some cases more than one genetic stock. The stock assessment modelling in both Suriname and Guyana is based upon two separate management units, rather than genetically different stocks. Both neighbouring fisheries in Suriname and Guyana have achieved MSC certification from which it can be concluded that the industrial fisheries in both countries are not impacting on the regional seabob stock (or stocks) and relevant bycatch species, and therefore not compromising their sustainability, and that conclusion should be robust irrespective of any new information on stock structure. The assessment/audit teams for both the Suriname and Guyana fisheries consider that a stock assessment based upon two separate management units remains valid.

1.2.5 Changes to the scientific base (P2 Ecosystem)

The Fisheries Department has provided the team with the following reports: Consolidated Bycatch Analysis for 2019-2022 (Fisheries Department, 2022b), ETP reports for the final quarter of 2021 (Ross, 2021) and the first three quarters of 2022 (Ross, 2022a; b and Husbands-Spellen, 2022), last haul reports for the final quarter of 2021 (Nedd, 2022a) and the 1st half of the year for 2022 (Nedd, 2022b), and the At-Sea Observer Report for 2021-2022 (Brown, 2022). In addition, the Fisheries Department provided a copy of the new Marine Mammal Protection Regulations 2022.

1.2.6 Traceability update

No changes to the processes that ensure traceability were reported.

1.3 Version Details

Table 5 Fisheries programme documents versions

Document	Version number
MSC Fisheries Certification Process	Version 2.2
MSC Fisheries Standard	Version 2.0
MSC General Certification Requirements	Version 2.4.1
MSC Surveillance Reporting Template	Version 2.1

2 Surveillance details

2.1 Surveillance results overview

2.1.1 Summary of Conditions

Table 6 Summary of conditions for Guyana Seabob fishery (SA = Surveillance Audit; OT = 'On Target'; BT = Behind Target; C = Closed). For conditions 3, 4 and 5, under Derogation 6, there is no requirement to formally evaluate progress against this condition.

No.	Condition	PI	PI original score	1st SA	2nd SA	3rd SA	4th SA
1	The assessment of stock status is subject to peer review.	1.2.4e.	75	C			
2	Main secondary species are highly likely to be above biologically based limits, or, if below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.	2.2.1a	75	OT	OT	BT	
3	Provide evidence that there is a strategy in place that can identify unacceptable impacts on ETP species.	2.3.2a	75	OT	OT	N/A Der. 6	
4	Accurate quantitative information that is adequate to measure trends and support a strategy to manage impacts on ETP species should be collected.	2.3.3 a&b	60	OT	OT	N/A Der. 6	
5	Evidence should be provided to demonstrate fishers comply with the management system under assessment.	3.2.3c	70	OT	OT	N/A Der. 6	
6	The fishery-specific management system should be subject to regular internal and occasional external review.	3.2.4b	70	C			
7	An MCS system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	3.2.3a	70	n/a	OT	C	

2.1.2 Total Allowable Catch (TAC) and catch data

Table 5: TAC and Catch Data for 2021 and 2022 (Fisheries department 2022a)

TAC	Year	2022	Amount	1872 days of monthly effort and 5,616 days per quarter
UoA share of TAC	Year	2022	Amount	100%
UoC share of total TAC	Year	2022	Amount	100%
Total green weight catch by UoC	Year (most recent)	2022	<u>Amount</u>	Processed weight: 3,045t Green weight: 7,004t
	Year (second most recent)	2021	<u>Amount</u>	Processed weight – 2,999t Green weight – 6,898t

2.1.3 Recommendations

The assessment and surveillance teams gave five non-binding recommendations:

1. HCR Robustness to uncertainty (1.2.2b)
2. Explicit Definition of Roles and Responsibilities (3.1.2a)
3. Accountability and transparency of management system and decision-making process (3.2.3d)
4. Monitoring and Management Performance Evaluation: Evaluation coverage (3.2.4a)
5. The assessment of stock status is subject to peer review (1.2.4e)

Progress in relation to these recommendations is detailed in section 2.3.3.

2.2 Re-scoring Performance Indicators

Condition 7 has been closed, which has led to Performance Indicator 3.2.3 reverting to its original score of 75 with 3.2.3c continuing not to meet SG80. A revised scoring table is presented below.

No information was received that has warranted a re-scoring of other Performance Indicators

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring Issue	SG 60	SG 80	SG 100
a	MCS implementation		
Guidepost	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
Met?	(Y)	(Y N)	(N)
Justification	<p>All powers of Monitoring, Control and Surveillance (MCS) are set out in the Fisheries Act (2002). This also gives the Coastguard and Police force the powers to act as Fisheries Officers and exercise the powers set out in the Act. Fisheries Regulations (No.3 2018) sets out the requirements for Vessel Monitoring Systems, and technical measures such as TEDs. The Guyana Marine Fisheries Management Plan (2013-2018) sets out further detail on the approach to MCS and identifies risk areas and action points for the plan period.</p> <p>There is no quota on seabob and no minimum landing size. As a result, enforcement is less focused on these aspects, than would be the case if these applied. Instead, the focus is more on enforcement of technical measures (Bycatch Reduction Devices, TEDs, minimum mesh size) and spatial measures (remaining in seabob zone). These are achieved by inspection at sea (in partnership with the Coastguard), aerial reconnaissance, inspections on landings and (under normal circumstances — see below) monitoring of VMS. The Coast Guard carry out strategic planning of inspection activities, which stipulate the level and focus of fisheries inspections, however outputs of this strategic planning have not been shared with the MSC assessors as Coast Guard patrols are not exclusively fisheries related.</p>		

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
	<p>The 2021 Annual report by the Legal and Inspectorate Unit (Fisheries Department, 2021) states: 100% of industrial trawl vessels, have been fitted with beacons and have since began transmitting. This is an important achievement considering the industrial seabob fleet was not monitored remotely during 2019 and parts of 2020, only traditional method were used i.e., log sheet submission and camera reviews.</p> <p>In addition, all seabob vessels are now fitted with onboard CCTV cameras. Although this is not a legal requirement (within the Fisheries Regulations), it is a requirement to land to the processing companies so is effectively a de facto condition of operation in the fishery. The CCTV footage is downloaded after every trip and is fully reviewed by staff within the processing plants. However, Fisheries Officers also now undertake spot checks of the CCTV footage. The CCTV helps to ensure that TEDs or BRDs are not removed or tampered with and that no catch is sold to other vessels. However, because the CCTV is a processing company requirement, rather than a regulatory requirement it is not a formal part of the MCS system. Furthermore, the CCTV system is not able to accurately determine catch composition to monitor compliance with the move-on requirements.</p> <p>Guyana seafood producers are expected to comply with the requirements of EU legislation on IUU (Illegal, Unregulated and Unreported) fishing meaning that all exports to the EU must be supported by a catch certificate showing that the catch has not originated from IUU fishing (Commission Regulation (EC) No 1010/2009).</p> <p>At the time of the first surveillance audit (May 2020) it was revealed that a significant technical problem had arisen with the internal GPS of older VMS units in April 2019 (week numbering using the 10-bit binary system reached its limit of 1,024 weeks and reset to week 0 (IMO 2019)). The GPS reset had a major impact on the VMS equipment used by many of the vessels in the Guyanese Seabob fleet, such that the VMS is no longer operable. Industry and government have been collaborating to source and fund a package of replacement units. In addition, efforts have been made to increase the amount of CCTV inspections and port inspections. New at-sea inspection capacity is also being commissioned. In spite of this it must therefore be concluded that since 2019 a key element of the spatial enforcement system is missing.</p> <p>However, with an inoperational VMS the key spatial pillar of the enforcement system is missing, therefore this can no longer be concluded to be a “system” although many enforcement “mechanisms” do remain in place (such as some at-sea monitoring, inspection of landings, gear inspections and CCTV). SG60 is therefore met, but not SG80 and a new condition (Condition 7) is raised. However, the assessors conclude that the MCS system does not meet the “comprehensive” definition required to score at the SG100 level, primarily because a more state of the art system, with higher levels of coverage could be achieved with increased resources.</p> <p>The above represents an MCS system which has been implemented with a demonstrated ability to enforce relevant management measures, strategies and/or rules, meeting SG80. This could also represent a comprehensive MCS system, but it is yet to have ‘demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules’ and therefore SG100 is not met.</p>		
b	Sanctions		
Guidpost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
	Met?	(Y)	(Y)	(N)
	Justification	<p>The 2022 VMS report states that ‘due to the large number of breaches accrued over the period by all trawlers, an industrial suspension of fourteen (14) days was implemented’. It concludes that ‘The Department in the last quarter of 2022 and 2023 will be engaging in a zero-tolerance approach when enforcing the Fisheries Act 2002 and relevant regulations. In 2023 the acquisition of further monitoring equipment and collaborations with national and regional stakeholders will be conducted. The Coast Guard will be conducting a regional ship rider training called Tradewinds, at which the Department is expected to conduct a session on Fisheries Laws and MCS activities to Regional Officers. This will allow for greater awareness and input into improving monitoring within the fisheries sector’ (Fisheries Department, 2022). The fishery-wide suspension shows consistent application of this sanction across vessels. Fishery officers expect this will provide effective deterrence, which should be evidenced in the next Annual reporting (SG80 is met).</p>		
c	Compliance			
	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	(Y)	(N)	(N)
	Justification	<p>All operable trawlers transmitted a beacon signal while conducting fishing activities. Any loss of signal by a trawler resulted in an inspection to determine the cause. The inspections found that the trawlers not transmitting were at dock and were either not operating or was under repair. The CPUE reporting also shows detailed catch and effort information is received from the fishing companies (SG60 is met).</p> <p>Monitoring of seabob vessel fishing activity using the VMS data resulted in a 14-day suspension of fishing operations during the 2021/22 fishing season due to the amount of infringements. A detailed VMS report for 2022 states that: The seabob fishing season was closed on August 30, 2022 and was expected to open October 19, 2022. However, due to the large number of breaches accrued over the period by all trawlers, an industrial suspension of fourteen (14) days was implemented. (Fishing Department, 2022). This evidence does not demonstrate that fishers comply with the management system, specifically in relation to the No Trawling Zone (NTZ) and therefore SG80 is not met.</p>		
d	Systematic non-compliance			
	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		(Y)	

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.
	Justification	The Annual Report (Fisheries Department,2021) reports 96% compliance with the use of Turtle Exclusion Device (TED) regulations, stating that ‘overall industrial compliance with TEDs far exceeded the 85% passing grade required to maintain Guyana’s Market internationally’. However, analysis of VMS data highlighted there was non-compliance due to No Trawling Zone Entry (NTZE), resulting in a temporary suspension of the fishery (Fisheries Department, 2022). This shows that there was a specific issue in compliance in 2022 on which decisive action was taken. This is mainly due to operators adjusting to the new 8-fathom limit and does not represent systematic non-compliance across the fishery, which the MSC standard describes as ‘recurring infringement of regulations in a coherent and coordinated manner’. This could be considered ‘systematic non-compliance’ if many UoA vessels similarly infringe in the following years, but currently SG80 is met.
	References	Amsterdam (2016), Ministry of Agriculture (2013); Fisheries Department (2015); IMO (2019) TED Inspectors <i>pers. comms</i> ; Coastguard <i>pers. comms.</i> ; Vessel Skippers <i>pers. comms.</i> ; Fisheries Act (2002); Fisheries Regulations (No.3 2018) Fisheries Department (2021) Annual report 2021. Fisheries Department Legal and Inspectorate Unit. Fisheries Department (2022) VMS Report Jan-August 2022
OVERALL PERFORMANCE INDICATOR SCORE:		75 70 75
CONDITION NUMBER (if relevant):		5 7

2.3 Conditions and Recommendations

2.3.1 Closed Conditions & Recommendations

Condition 1 (closed during 1st surveillance)

Performance Indicator	PI1.2.4e. The assessment of stock status is subject to peer review.
Score	75
Rationale	The data inputs and model uncertainties in the 2013 assessment were peer reviewed by CRFM. However, this assessment is now 5 years old, and a new updated stock assessment is in progress. The new assessment is using improved MCMC simulations within bespoke software, so at present there has been no peer review of this revised assessment approach. The assessment team concluded that whilst the 2013 stock assessment had been peer-reviewed, this assessment was now dated and the SG80 would not be met until the new assessment had been fully peer-reviewed.
Condition	It should be shown that the assessment of seabob stock status is subject to peer review.

Milestones	<p>Year 1: The current ongoing stock assessment should be completed, and an appropriate external peer review should be commissioned (no change to score).</p> <p>Year 2: An external peer review of the stock assessment should be completed (resulting PI score: 80).</p> <p>Year 3 & 4: No further action required.</p>
Client action plan	<p>Year 1 Action: Arrange peer review. The Guyana Government (Fisheries Department) will contact CRFM and Suriname Fisheries (Yolanda Babb) to arrange a joint review of seabob stock assessments.</p> <p>The SWG will commission and approve appropriate ToRs for the review. The review will, among other things, confirm that best scientific practice has been applied in carrying out the stock assessment, the results are valid (applying corrections if necessary), and how the results will be used for scientific advice taking account the uncertainty. The reviewers will, with the assessment team, prepare the scientific advice appropriate for the next 5 years, including a schedule of further work and recommendations.</p> <p>CRFM will arrange the review, employing independent external peer reviewers, and provide international support to Guyana and Suriname in conducting the review. The Shrimp and Groundfish Working Group (SGWG) will supply internal reviewers. External reviewer(s) will be provided by CRFM.</p> <p>The performance of the UoA is not expected to improve before the review itself is complete.</p> <p>Means of Verification: Emails, Approved ToRs, Review schedules, Final stock assessment reports.</p> <p>Year 2 Action: Complete peer review and respond to findings. The peer review will be conducted before August 2020 to allow time for the assessment team and SGWG response. The review will be organised by CRFM, Guyana Fisheries Department and Suriname Fisheries Department in either Suriname or Guyana. The meeting will convene the CRFM Shrimp and Groundfish Working Group, including 1 or more external reviewers. The meeting and the reviewers will complete separate reports based on their ToRs.</p> <p>With completion of the peer review report, 1.2.4 will meet SG80.</p> <p>Means of Verification: Final SA report. Peer review report. CRFM SGWG Meeting Report. Research plan</p> <p>Year 3-4 Action: No action required, but the peer review recommendations will be addressed.</p> <p>Means of Verification: Minutes of SWG</p>
Consultation on condition	<p>(At the time of full assessment) Letters of support from SWG, Fishery Department, CRFM and GATOSP.</p>
Progress on Condition (Year 1)	<p>The new stock assessment has been completed by the independent consultant, Dr. Medley, and was presented at the CRFM Continental Shelf Fisheries Working Group meeting in 2019, which was convened inter alia to provide a thorough peer review of the assessment methodology and its implementation in both the Guyana and Suriname seabob fisheries. The meeting was attended by government managers and scientists from both countries along with WWF representatives, technical staff from other countries and the CRFM Secretariat.</p>

	<p>The review group accepted that the integrated assessment model permitted the simultaneous fitting of information from various sources, and therefore afforded an opportunity to make use of all available, suitable data. The review considered inter alia the growth rate (K) for the von Bertalanffy model, the value of the natural mortality rate, the most appropriate size-at maturity estimate, the fitting of average counts data and factors affecting effort measures. The CRFM meeting in 2019 also reviewed and evaluated the implementation of revised harvest control rules (HCRs).</p> <p>The audit team considered that the review of the stock assessment model and its implementation by both internal and external participants at the CRFM meeting constituted an appropriate peer review of the stock assessment, and therefore both the Year 1 and 2 milestones had been met and the condition can therefore be closed.</p> <p>However the audit team noted that whilst the peer review carried out by the CRFM meeting looked in detail at the parameter and data inputs for the model for both the Guyana and Suriname fisheries, the new stock assessment approach would benefit from an expert review of the coding in the software in addition to data input and uncertainties within the model. The stock assessment consultant, Dr Paul Medley, states that all assessment work has been carried out in RMarkdown scripts which are fully documented and reproducible, and therefore amenable to peer review. A new recommendation to this effect has been documented in section 3.2.</p>
Status	The Year 1 and Year 2 milestones have been met and the condition is now CLOSED .

Condition 6 (closed during 1st surveillance)

Performance Indicator	PI3.2.4(b):
Score	70
Rationale	Since the Seabob Management Plan was first drafted (within the Guyana Marine Fisheries Management Plan (2013-2018) and was since updated (within the Guyana Seabob Fisheries Management Plan (2015-2020)), no formal external review has been undertaken on the performance of the Seabob Management System. SG80 is therefore not met. Such a review / evaluation should therefore be undertaken to inform the next 5-year period of the Seabob Fisheries Management Plan.
Condition	The fishery-specific management system should be subject to regular internal and occasional external review.
Milestones	<p>Year 1: Undertake preparations for an external review / evaluation of the Seabob Management Plan (no change to score).</p> <p>Year 2: Commission an external review (no change to score).</p> <p>Year 3: External review to be in process (no change to score).</p> <p>Year 4: External review to be completed (resulting PI score change to 80).</p>

Client action plan	<p>Year 1 Action: Prepare ToR for external review of the Seabob Management Plan and approach potential service providers and funding agencies (potentially in alignment with the ToR for peer review of the Seabob Stock Assessment – Condition 1).</p> <p>Means of Verification: proposal to the SWG and minute of the decision taken</p> <p>Year 2 Action: Implementation of the proposed option. Approach to one or more bodies to fund and undertaken the external review, and commissioning of the work.</p> <p>Means of Verification: relevant minutes of the SWG</p> <p>Year 3 Action: External review in process</p> <p>Means of Verification: relevant minutes of the SWG</p> <p>Year 4 Action: External review completed.</p> <p>Means of Verification: external review report presented to the SWG</p>
Consultation on condition	Letters of support from SWG, Fishery Department and GATOSP.
Progress on Condition (Year 1)	<p>Considerable progress has been made within the first year of the fishery certification in relation to this condition. In May 2019 Caribbean Regional Fisheries Mechanism (CRFM) conducted a short review of (i) the Guyana Seabob Fisheries Management Plan 2015 – 2020 and (ii) the Guyana Marine Fisheries Management Plan 2013 – 2020 (Murray 2019 a & b). This review was primarily a review of the way the management plan had been written rather than a review of its performance.</p> <p>Subsequently, The CRFM Continental Shelf Fisheries Working Group (CSWG) met in Georgetown Guyana in August 2019 to review the management of both the Guyana and Suriname Seabob fisheries. Although key stakeholders in the Guyana Fishery were involved in this review, the involvement of CRFM regional technical experts and neighbouring Surinamese stakeholders means that it can be considered an external process. The proceedings of this 2-day workshop and 2 follow-up meetings convened electronically have been written up (CRFM 2019).</p>
Status	This meets all of the requirements set out in the milestones for the condition. The condition is therefore CLOSED . See the revised scoring justification for revised score.

2.3.2 Open Conditions

In February 2021, MSC issued Derogation 6, the purpose of which was to provide a reprieve to fishery certificate holders that have the potential to face exceptional difficulties in making progress on conditions as a result of the impacts of Covid-19 on fisheries management systems.

<https://www.msc.org/docs/default-source/default-document-library/for-business/program-documents/chain-of-custody-supporting-documents/msc-derogation-6-covid-19-fishery-conditions-extension.pdf>

The objective of the derogation was to extend existing deadlines on eligible conditions by 12 months and to revise condition milestones to account for the extended deadline. The derogation applies only to conditions that are set against a Performance Indicator listed in the table below:

Performance Indicator	Description
1.2.1	Harvest strategy (management)
1.2.2	Harvest control rules and tools
1.2.3	Information / monitoring
2.1.2	Primary species management
2.1.3	Primary species information
2.2.2	Secondary species management
2.2.3	Secondary species information
2.3.2	ETP management strategy
2.3.3	ETP information
2.4.2	Habitat management
2.4.3	Habitat information
2.5.2	Ecosystem management
2.5.3	Ecosystem information
3.1.1	Legal and/or customary framework
3.1.2	Consultation roles and responsibilities
3.1.3	Long term objectives
3.2.1	Fishery specific objectives
3.2.2	Decision making processes
3.2.3	Compliance and enforcement
3.2.4	Monitoring and evaluation

MSC Derogation required that “the CAB shall apply the derogation at publication of the next surveillance audit report after 28 March 2021”. At the 2nd surveillance audit undertaken in October 2021, the audit team did not implement Derogation 6 as significant progress had been made by the Client in meeting the outstanding conditions. Since that 2nd surveillance audit, the Fisheries Department advised that a major turnover of staff and continuing restrictions imposed by Covid-19 had significantly impacted on the ability of the Fisheries Department and Client to make progress against the outstanding conditions. The CAB, Vottunarstofan Tún ehf., had therefore submitted a variation request to MSC to implement Derogation 6 at the forthcoming 3rd surveillance audit in December 2022. At the time of the submission of the variation request, the latest WHO’s Public Health and Social Measures (PHSM) severity index for Guyana was next-to “most severe”, with restrictions still comparatively high on gatherings, domestic movements and international travel. MSC subsequently accepted this Variation Request, and so the audit team applied Derogation 6 to the evaluation of progress against the relevant conditions. Four outstanding conditions on PIs 2.3.2 (Condition 3), 2.3.3 (Condition 4), 3.2.3c (Condition 5) and 3.2.3a (Condition 7) are therefore covered by Derogation 6 and so these conditions have been extended for a further 12 months, and the Client has an additional 12 months to meet all condition milestones. In practice, this means that at this third surveillance audit, there are effectively no milestones to meet, and therefore there is no requirement for the Audit Team to assess progress against milestones (e.g., behind target, on target, ahead target, closed). Derogation 6 does not apply to Condition 2 on PI 2.2.1. Where required the audit team has therefore set out the extended deadlines and revised milestones. For conditions that were originally scheduled to be met by the fourth surveillance audit, the deadline has now been extended to the first

surveillance audit of the recertification. The Client has also provided a revised Client Action Plan to take into account the new deadlines and milestones.

Condition 2

Performance Indicator	PI2.2.1a
Score	75
Rationale	The results of the RBF PSA exercise conclude that there is a potential risk to Longnose stingray and Smooth butterfly ray from the Seabob fishery (which have been identified as “main” secondary species in the fishery). Further evidence is therefore required to demonstrate that these species are above biologically based limits, or if below such limits there is evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. Alternatively, it may be demonstrated that the species are not a “main” species in the fishery.
Condition	It should be shown that main secondary species are highly likely to be above biologically based limits, or, if below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.
Milestones	<p>Year 1: Provide evidence that there is a plan in place to gather information about the status of the Longnose stingray and Smooth butterfly ray stocks and effect that the fishery may have on these stocks. Or a plan to ensure that the Longnose stingray and Smooth butterfly ray are demonstrated to no longer be considered as “main” secondary species (no change to score).</p> <p>Year 2: Provide evidence of progress against the plan presented at the first audit, including evidence that research into an evaluation of the direct effect of the fishery on the Longnose stingray and Smooth butterfly ray stocks or research has commenced on reducing catch rates (no change to score).</p> <p>Year 3: Provide report evaluating the direct effect of the fishery on the Longnose stingray and Smooth butterfly ray stocks or demonstrating that these species no longer meet the MSC definition of “main”. In case the report concludes that the stocks are not above biological based limits then there should be evidence of recovery or evidence that the client is taking further steps to develop a demonstrably effective partial strategy that the UoA does not hinder recovery and rebuilding of these stocks (no change to score).</p> <p>Year 4: (if concluded necessary at year 3) provide evidence for the implementation of a demonstrably effective partial strategy such that the UoA does not hinder recovery and rebuilding of the Longnose stingray and Smooth butterfly ray stocks (resulting PI score: 80).</p>
Client action plan	<p>Year 1 Action: Development of a plan to assess distribution, abundance and status of rays in the inshore zone. Develop a research proposal to sample demersal fin fish in the inshore no trawl zone using a standard commercial seabob trawler, sufficient to allow assessment of species distribution, abundance, and stock condition.</p> <p>The Fishery Department will the extent to which artisanal fisheries catch rays, and continue independent observer coverage of the seabob industrial fleet activities.</p> <p>Means of Verification: Research proposal for fishing survey presented to the SWG. Plan for sampling of artisanal fisheries</p> <p>Year 2 Action: Implementation of the monitoring / sampling research plan.</p>

	<p>Means of Verification: Reports on implementation of these research projects in the minutes of the SWG</p> <p>Year 3 Action: Analysis of data with focus on risk to Longnose stingray and Smooth butterfly ray stocks. Report analysing the information collected and evaluation of the direct effect of artisanal and industrial fisheries on the Longnose stingray and Smooth butterfly ray stocks – or demonstration that these species no longer meet the MSC definition of “main”.</p> <p>Means of Verification: Report on fin-fish abundance and distribution.</p> <p>Year 4 Action: If necessary, respond to conclusions and recommendations from report and provide evidence for the implementation of a demonstrably effective partial strategy such that the UoA does not hinder recovery and rebuilding of the Longnose stingray and Smooth butterfly ray stocks.</p> <p>Means of Verification: Minutes from SWG</p>
Consultation on condition	Letters of support from SWG, Fishery Department and GATOSP.
Progress on Condition (Year 1)	<p>In relation to this Condition the Fisheries Department has drafted two research proposals. These are the “Proposal for Fish Sampling in the Inshore Industrial Fisheries of Guyana.” and the “Draft Proposal for the Analysis of Stingray bycatch in the Inshore Industrial Fisheries in Guyana.”. The objectives of these plans are; to conduct a sampling using a seabob trawler to allow assessment of species distribution, abundance and stock condition of finfish and rays, to determine the impact from industrial trawling on ray populations and to determine the general status and stock condition of rays in within the inshore zone. Data collected will be analysed and used to calculate catch per unit effort (CPUE) in kg/h for shrimp and fish caught. Client has also provided reports with the results of the Sea Observer Data Collection Programme for 2019. The objective of this programme is to collect data on discards and interactions with endangered and protected species. The reports show composition of discards (percentages) and interactions with ray species (numbers caught). The team notes that although these reports provide the composition of discards it is not possible to discern the percentages that Longnose stingray and Butterfly ray constitute of the total catch (this information therefore does not allow a revised determination of whether these species are “main” are “minor”, which could lead to a revised score). The alternative way to meet the requirements of this condition would be to show that Longnose stingray and Butterfly ray are highly likely to be above biologically based limits, or, if below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. The team notes that the current proposals could be further improved by additional focus on the data and scientific analysis needed to assess the status of Longnose stingray and Butterfly ray or the impact of the fishery on these stocks.</p>
Progress on Condition (Year 2)	<p>The Fisheries Department has provided the team with 6 reports: Sea Observer Annual Report (2020), Sea Observer First Half Report (2021), ETP Annual Report (2020), Half Yearly Report on Endangered, Threatened and Protected Species (E.T.P) interaction (2021), Last Haul Data Collection Report (2020) and the Last Haul First Half Report (2021). These reports provide the results of the continuation of the Observer Program, the ETP monitoring programme and the Last Haul Program. The ETP reports also contain information on the bycatch of vulnerable (secondary) species like Longnose stingray and Smooth butterfly ray. Furthermore, the Fisheries Department (FD) has informed the team that research trips have been carried out in order to compare bycatches of fish and elasmobranchs above and below the 8 fathom line. (The fathom line was moved outwards from 7 to 8 fathoms in 2018). In the Sea Observer First Half Report (2021) information is provided on the catch composition of the (18) hauls that have been sampled at the observer trips. The data show that Longnose stingray and Smooth butterfly stingray both constitute around 1 % of the total (sampled) catch. The team notes that data provided in</p>

	<p>the Last haul reports do provide insight in the composition of bycatches but not in total catch. The information in the ETP reports do not allow for the analysis of the status of, or the impact of the fishery on, the stocks of Longnose stingray and Smooth butterfly ray. The team concludes that the data on total catch composition are rather limited and more focus on this aspect is advisable. If the information on catch composition would continue to show that Longnose stingray and Smooth butterfly ray no longer have to be considered main secondary species this condition can probably be closed in the next years. However, if this will not be the case, further analysis of the status of these stocks or the impact of the fishery on these stocks would still be needed to close this condition.</p>
Progress on condition (year 3)	<p>The Fisheries Department report that only four observer trips were undertaken during the period October 2021 to October 2022 against a target of 16 trips during that period and therefore there is only a low level of information on bycatch of the Longnose stingray and Smooth butterfly ray in the seabob fishery. The At-Sea Observer report showed that for those four trips the longnose stingray and smooth butterfly ray accounted for 77% of all ray species caught in the seabob fishery. The Last Haul reports provided by the Fisheries Department appear now to provide information on the catch in weight of bycatch species as a proportion of the total catch, although it should be noted that the number of last hauls sampled in 2022 was lower than expected. For the first half of 2022 longnose stingray and smooth butterfly ray comprised 16.2% and 4.1% respectively of the total catch by weight confirming that longnose stingray should be designated as a main secondary species but the corresponding data for the last haul in the final quarter of 2021 was only 1.6% and 2.4% for longnose stingray and smooth butterfly ray respectively. There is also information available in the ETP reports on interactions with longnose stingray and smooth butterfly ray but the data provided do not allow for the analysis of the status of, or the impact of the fishery on, the stocks of Longnose stingray and Smooth butterfly ray.</p>
Status	<p>The milestone at this 3rd surveillance audit is <i>“Analysis of data with focus on risk to Longnose stingray and Smooth butterfly ray stocks. Report analysing the information collected and evaluation of the direct effect of artisanal and industrial fisheries on the Longnose stingray and Smooth butterfly ray stocks – or demonstration that these species no longer meet the MSC definition of main secondary species”</i>. The audit team conclude whilst some information is available, the number of observer trips and last haul samples was low in 2021/22 and therefore there is only limited data to determine whether the longnose stingray and smooth butterfly ray should be considered as main secondary species, and there is clearly not sufficient analysis as yet to evaluate the direct effect of the seabob fishery on longnose stingray and smooth butterfly ray stocks. The condition is therefore behind target.</p>

Condition 3

Performance Indicator	PI2.3.2 (a)
Score	75
Rationale	<p>Fishermen are requested to report on ETP interactions through ETP logsheets. The team has concluded that the data collected are insufficient to support a management strategy that can identify possible unacceptable impacts. Furthermore, a move-on rule is in place, but it is unclear whether fishermen actually practice the prescribed actions in case of interactions with ETP species. Therefore, it cannot be concluded that there is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species. SG80a is not met.</p>

Condition	Provide evidence that there is a strategy in place that can identify unacceptable impacts on ETP species.
Milestones	<p>Year 1: Provide evidence of the development of a plan to strengthen the monitoring of impacts on ETP species. (no change to score).</p> <p>Year 2: Provide evidence of progress against the plan presented at the first audit (no change to score).</p> <p>Year 3 4 (Revised 3d Surv. Der.6): Provide evidence for the implementation of a demonstrably effective strategy that enables the identification of unacceptable impacts on ETP species. Score 80.</p>
Client action plan	<p>Year 1 Action: Development of a plan to strengthen monitoring and data collection of ETP sightings and interactions. Preparation of a plan to determine the impacts of fishing on ETP species – strengthening ETP reporting, application of the move-on rule, monitoring of application of the move-on rule, oversight of ETP interactions via CCTV monitoring.</p> <p>Means of Verification: Presentation of a plan. Presentation of a review of effectiveness over previous 12 months</p> <p>Year 2 Action: Report on progress in implementation of the plan. Review and updating of the adequacy of the plan.</p> <p>Means of Verification: Progress report, including plan review</p> <p>Year 3 4 Action: Review report. Critical review of the nature and scale of fishery / ETP interaction and the effectiveness of the ETP reporting, monitoring and oversight systems.</p> <p>Means of Verification: Review report</p>
Consultation on condition	Letters of support from SWG, Fishery Department and GATOSP
Progress on Condition (Year 1)	<p>With respect to this Condition the Fisheries Department has drafted “A plan to strengthen monitoring and data collection of ETP sighting and interaction”. The objectives of this plan are: to improve the collection of accurate data and monitoring of ETP and vulnerable species sighting and interaction, the strengthening of the compliance of fishers with move on rule and to promote sustainable management of fisheries resources.</p> <p>The main goal of the plan is to improve the reporting systems in the fishery. These are the reporting on ETP interactions through logsheets and the Observer Program. Concerning the ETP reporting system two new logsheets have been developed. The ‘ÉTP Species Vessel Log Sheet’ and the ‘Vulnerable Species Vessel Log Sheet’. On the first sheet interactions with turtles, whales and dolphins can be recorded. At the latter the interactions with ray species such as alectric rays, butterfly rays and longnose stringray. The sheets now clearly state that fishermen should mark whether species were only observed or whether they were caught and released (dead or alive). The plan describes that a captains training and a separate species identification training have been organised. Objectives of the training meetings were to improve awareness, improve the survival of caught ETP species by mitigating measures and to train participants to identify ETP species in order to improve the quality of the ETP interaction monitoring through log-sheets. Posters and species identification booklets have also been distributed among the fleet.</p> <p>The team concludes that several actions have been undertaken in order to strengthen the monitoring of impacts on ETP species and these actions have been described in a plan. These actions are likely to improve data collection on interactions with ETP species and</p>

	<p>training of fish captains and crew regarding move on rule and handling of ETP species caught would reduce impacts.</p> <p>The team notes that additional focus on the collection of accurate quantitative data on impacts on turtle species that is adequate to measure trends would further strengthen the strategies in place to meet the requirements of this Condition and Condition 4.</p>
Progress on Condition (Year 2)	<p>The Fisheries Department has provided the ETP Annual Report (2020) and the 2021 Half Yearly Report on Endangered, Threatened and Protected Species (E.T.P). Both reports state that no turtles have been caught. Furthermore 8 observer trips have been conducted in 2020 and 3 in 2021. The FD has informed the team at the audit that no turtles have been caught during these observer trips. The FD also informed the team that no turtle interactions (catches) have been seen on CCTV footage. The ETP reports and the Observer reports provide evidence that the recording of ETP interactions and the Observer Programme have been continued. An annual training of vessel captains towards ETP reporting and species identification has been organized by the FD. The movement of the fishery further out to the 8th fathom line is likely to have reduced the likelihood of interactions.</p>
Progress on condition (year 3)	<p>The Fisheries Department has again this year provided quarterly reports on the interactions of the fishery with Endangered, Threatened and Protected Species (ETP). In comparison with last year’s surveillance audit when no interactions with turtles were reported, in the last quarter of 2021 interactions with 2 leatherback, 4 Olive Ridley and 1 green turtle were recorded, in the first quarter of 2022 interactions with 2 leatherback turtles and 7 loggerhead turtles were recorded, and in the third quarter of 2022 interactions with 15 green turtles, 10 hawksbill and 14 leatherback turtles were recorded. No interactions with turtles were recorded in the second quarter of 2022. The ETP reports and the Observer reports provide evidence that the recording of ETP interactions and the Observer Programme have been continued, although sample levels within the Observer Programme were low in 2021 and 2022. An annual training of vessel captains towards ETP reporting and species identification has been organized by the Fisheries Department.</p>
Status	<p>The milestone at this 3rd surveillance audit is “Provide evidence for the implementation of a demonstrably effective strategy that enables the identification of unacceptable impacts on ETP species”. Data continue to be collected on the interactions with ETP species, but under Derogation 6, there is no requirement to formally evaluate progress against this condition. An additional 12 months has been given to meet this condition. The revised milestones are as follows:</p> <p>Year 4: Provide evidence for the implementation of a demonstrably effective strategy that enables the identification of unacceptable impacts on ETP species. Score 80.</p>

Condition 4

Performance Indicator	PI2.3.3
Score	60
Rationale	<p>The available information points to a limited impact on sea turtles in Guyana waters also as a consequence of a consistent use of TEDs. The information is considered adequate to support measures to manage the impact on turtle species and thus SG60 is met.</p> <p>The information derived from the ETP logsheets and the other available information however does not allow for an accurate quantitative estimation of impacts of the UoA on sea turtle species and consequently is also not adequate to measure trends. Therefore, SG80b is not met and a Condition is formulated.</p>

Condition	Accurate quantitative information that is adequate to measure trends and support a strategy to manage impacts on ETP species should be collected.
Milestones	<p>Year 1: Improvements to the current system of monitoring interactions with ETP species should be implemented (no change to score).</p> <p>Year 2: Provide evidence of progress against the plan presented at the first audit (no change to score).</p> <p>Year 3 4 (Revised 3d Surv. Der.6): Collate and analyse data on the interactions with ETP species (no change to score).</p> <p>Year 4 Year 1 of the recertification (Revised 3d Surv. Der.6): Demonstrate that information is adequate to measure trends and support a strategy to manage impacts on ETP species (resulting PI score: 80).</p>
Client action plan	<p>Year 1 Action: Strengthen fishery interaction reporting. Prepare proposals for improvement in the collection and collation of information on ETP interactions on-board and later on-shore, and support and further build on the monitoring and reporting work forming part of the actions with regard to addressing Condition 2.</p> <p>Means of Verification: Report – review of current systems and areas for improvement.</p> <p>Year 2 Action: Review of adequacy of data collection for assessing impact of fishing on ETP species. Interrogate available data and data streams to review the effectiveness of data collection, and reflect on how this might be improved.</p> <p>Means of Verification: Report demonstrating the nature of and changes in the interaction between fishing and ETP species.</p> <p>Year 3 4 Action: Further review of adequacy of data collection for assessing impact of fishing on ETP species. Use the outputs of this analysis to review the effectiveness of data collection, and reflect on how this might be improved.</p> <p>Means of Verification: Report collating and analysing the available data demonstrating the nature of and changes in the interaction between fishing and ETP species.</p> <p>Year 4 Year 1 of recertification Action: Demonstration that data systems working effectively. Report demonstrating the adequacy of data gathering and collation practices to measure trends and support a strategy to manage impacts on ETP species</p> <p>Means of Verification: Report demonstrating the nature of and changes in the interaction between fishing and ETP species.</p>
Consultation on condition	Letters of support from SWG, Fishery Department and GATOSP
Progress on Condition (Year 1)	It was reported to the team that several improvements to the system of monitoring interactions with ETP species have been implemented. The ETP logsheet has been improved and a separate logsheet was developed for vulnerable (ray) species. Special attention has been given to the raising of awareness and the training of vessel captains and crew so that they understand the purpose of the ETP monitoring system and know what to do when catching an ETP species (handling on board) and are better able to identify ETP species. It has been reported that these efforts will be continued. The actions taken are likely to improve data collection on interactions with ETP species. Training of fish captains and crew regarding the move on rule and handling of ETP species caught is likely to contribute to further reduction of impacts on ETP species. The results of the 2019 ETP interaction monitoring through ETP interaction logsheets have been presented in the ETP Annual Report 2019. The report contains mainly information on interactions with (4) ray species that are vulnerable and not ETP species. On ETP species the report states that

	<p>18 encounters with loggerhead turtles have been reported. Whether these animals were caught or seen was not noted.</p> <p>The team notes that additional focus on the collection of accurate quantitative data on impacts on turtle species that is adequate to measure trends would further strengthen the strategies in place to help meet the requirements of this Condition and Condition 3.</p>
Progress on Condition (Year 2)	<p>The Fisheries Department has provided the ETP Annual Report (2020) and the 2021 Half Yearly Report on Endangered, Threatened and Protected Species (E.T.P). These reports do not show any catches of ETP species (turtles). The FD has also provided 2 reports concerning the Observer programme. Eight observer trips have been conducted in 2020 and 3 in 2021. During these observer trips no turtles have been caught. During the audit both FD and WWF have expressed the view that it is likely that the use of TEDs by all vessels (inspections are carried out regularly) has effectively prevented bycatches of turtles and resulted in the zero bycatch observed. Turtles that have been found dead on the beach showed marks of set nets and it is thus unlikely that seabob trawlers have caught and discarded them. The FD and WWF have also stated that a reduction in the number of turtles nesting on beaches has been reported. This reduction might also have reduced the likelihood of interactions of fishermen with turtles.</p>
Progress on condition (year 3)	<p>The Fisheries Department has again this year provided quarterly reports on the interactions of the fishery with Endangered, Threatened and Protected Species (ETP). In comparison with last year's surveillance audit when no interactions with turtles were reported, in the last quarter of 2021 interactions with 2 leatherback, 4 Olive Ridley and 1 green turtle were recorded, in the first quarter of 2022 interactions with 2 leatherback turtles and 7 loggerhead turtles were recorded, and in the third quarter of 2022 interactions with 15 green turtles, 10 hawksbill and 14 leatherback turtles were recorded. No interactions with turtles were recorded in the second quarter of 2022. Whether these animals were caught or seen was not noted.</p> <p>The audit team considers that more detailed information on the type of interactions with turtles is required to demonstrate that information is adequate to measure trends and support a strategy to manage impacts on ETP species, and therefore close this condition.</p>
Status	<p>The milestone at this 3rd surveillance audit is "Collate and analyse data on the interactions with ETP species". Data continue to be collected on the interactions with ETP species, but under Derogation 6, there is no requirement to formally evaluate progress against this condition and the revised milestones are as follows:</p> <p>Year 4. Collate and analyse data on the interactions with ETP species (no change to score).</p> <p>Year 1 of the recertification: Demonstrate that information is adequate to measure trends and support a strategy to manage impacts on ETP species (resulting PI score: 80).</p>

Condition 5

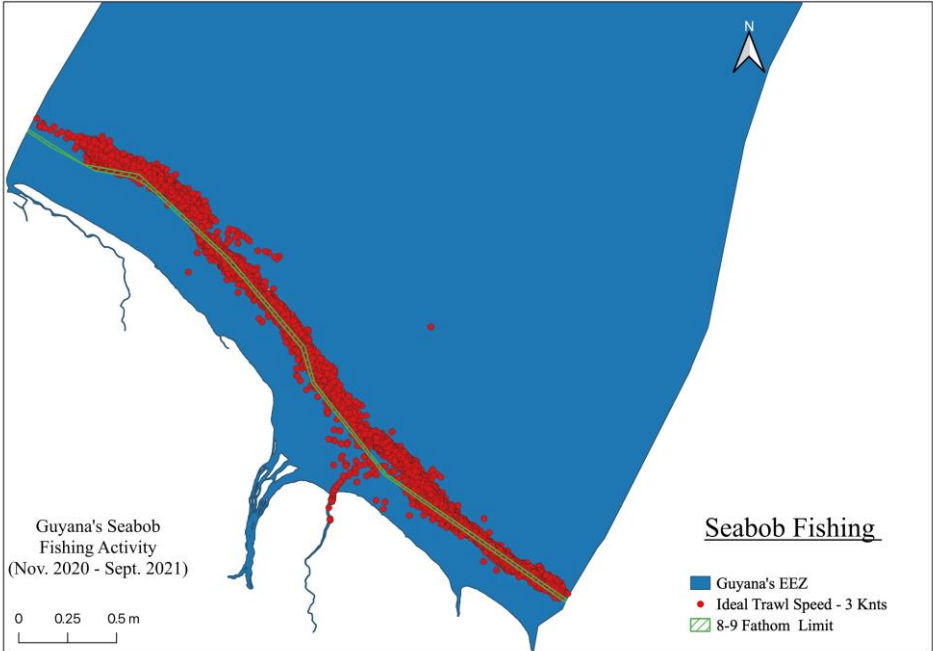
Performance Indicator	PI3.2.3(c):
Score	75-70 75 (revised to original PI score with closure of Condition 7)
Rationale	<p>Whilst the stakeholders interviewed (most notably the Fisheries Department, Coastguard and TED inspectors) all stated that the level of compliance is good and that it is likely to be further improved since the changes in the 2018 Fishery Regulation and the adoption of CCTV, there is not an updated VMS compliance report showing the effect of the 2018 Fishery Regulations on compliance. An updated VMS report showing the compliance of</p>

	the fishery following the adoption of the 2018 Fishery Regulations would meet the evidential requirements of SG80.
Condition	Evidence should be provided to demonstrate fishers comply with the management system under assessment.
Milestones	<p>Year 1: Consider scope and plan for the provision of evidence to demonstrate fishers comply with the management system under assessment (since the 2018 Fishery Regulation). (no change to score)</p> <p><i>Milestones revised at the time of the Year 1 surveillance audit as a result of technical issue with older VMS units (see rescored 3.2.3a for details).</i></p> <p>Year 2: Plan for updated VMS system to be included within next evidential review of compliance (no change to score).</p> <p>Year 2 3 4 (Revised 3d Surv. Der.6): Collate and analyse all relevant compliance evidence (including new VMS evidence) (no change to score)</p> <p>Year 3 4 Year 1 of the recertification (Revised 3d Surv. Der.6): Complete report (resulting score: 80)</p>
Client action plan	<p>Revised at 1st surveillance</p> <p>Note: GATOSP will source new VMS service (see condition 7).</p> <p>Year 2 Action: Critical review of annual fleet performance and VMS records across the fleet for several years to demonstrate extent of compliance / non-compliance – and conformity with management plan and management objectives.</p> <p>Means of Verification: report to SWG</p> <p>Year 3 4 Action: Summary report of MCS systems and industry compliance. Critical review of annual fleet performance and VMS records across the fleet for several years to demonstrate extent of compliance / non-compliance – and conformity with management plan and management objectives.</p> <p>Means of Verification: report to SWG</p> <p>Year 4 Year 1 of recertification Action: Updated report and review. Updated report, but with focus on whether or not any impact from increased penalties for non-compliance arising from the 2018 Fishery Regulations can be identified. Particular focus on demonstrating that fishers are or are not complying with the management system in place.</p> <p>Means of Verification: progress report to SWG, progress report and review</p>
Consultation on condition	Letters of support from SWG, Fishery Department and GATOSP
Progress on Condition (Year 1)	The Legal & Inspectorate Unit 2019 Annual Report provides an overview of all control and enforcement activities and compliance evidence. This highlights a number of challenges and recommendations which should be followed. A significant challenge for the seabob industry has been the technical fault that has developed within older VMS units due to the GPS digital date rollover issue, which renders units inoperable. In response to this, the Fisheries Department has increased surveillance and monitoring of the seabob fishery through increased use of on-board CCTV inspection, surveillance inspection and wharf inspection, with the aim of maintaining compliance. The industry continues to be monitored through TED inspections with a high TED Technical Compliance Rate (TTCR), as required by NOAA. At the time of the 1 st surveillance audit no anecdotal or material evidence was provided of seabob vessels fishing outside of their permitted zone. In addition, a new VMS system is being sourced (which is the subject of a new Condition 7).

<p>Progress Condition (Year 2)</p>	<p>The vessel monitoring system was sourced and was installed in November 2020. The current VMS system provides daily updates on vessel positions and indications of infringements and or breaches outlined under the General Fisheries Regulations 2018. All infringements observed, were recorded by TED Inspectors (see TED reports). It should be noted that no sanctions were implemented during the reporting period, however, warnings were issued, and corrections were made to device prior to vessel departure. The Fisheries Department is currently working to operationalize its prosecutorial approaches.</p>
<p>Progress on condition (year 3)</p>	<p>The (revised) milestone for Year 3 is to ‘collate and analyse all relevant compliance evidence (including new VMS evidence)’. This is not expected to result in a change of score.</p> <p>A section on VMS is presented within the 2021 Annual report by the Legal and Inspectorate Unit (Fisheries Department, 2021). It states: 100% of industrial trawl vessels, have been fitted with beacons and have since began transmitting. This is an important achievement considering the industrial seabob fleet was not monitored remotely during 2019 and parts of 2020, only traditional method were used i.e., log sheet submission and camera reviews. A map (Figure 1) is also provided to show seabob fishing activity in 2021.</p> <p>It has also been reported that monitoring of seabob vessel fishing activity using the VMS data resulted in a 14-day suspension of fishing operations during the 2021/22 fishing season due to the amount of infringements. A detailed VMS report for 2022 states that:</p> <p>The seabob fishing season was closed on August 30, 2022 and was expected to open October 19, 2022. However, due to the large number of breaches accrued over the period by all trawlers, an industrial suspension of fourteen (14) days was implemented. As such, the seabob fishing season was opened on November 7, 2022.</p>
<p>Status</p>	<p>The new VMS system has enabled non-compliance to be identified and management action was taken. This shows that the year 3 milestone is met and that the condition is nominally On Target (no change in score). However under Derogation 6, there is no requirement to formally evaluate progress against this condition and the revised milestones are as follows:</p> <p>Year 4: Collate and analyse all relevant compliance evidence (including new VMS evidence) (no change to score)</p> <p>Year 1 of the recertification: Complete report (resulting score: 80)</p>

Condition 7 (introduced following first surveillance audit in 2020)

<p>Performance Indicator</p>	<p>PI3.2.3(a):</p>
<p>Score</p>	<p>70</p>
<p>Rationale</p>	<p>At the time of the first surveillance audit (May 2020) it was revealed that a significant technical problem had arisen with the internal GPS of older VMS units in April 2019 such that, across the fleet, the VMS is no longer operable or enforceable. Industry and government have been collaborating to source and fund a package of replacement units. In addition, efforts have been made to increase the amount of CCTV inspections, port inspections and increasing the at sea enforcement capacity. In spite of this the lack of VMS means that a vital spatial element of the the MCS system is missing. VMS, or an alternative form of spatial enforcement, therefore needs to be reinstated.</p>

Condition	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.
Milestones	<p>Year 1: Condition added at Year 1 – therefore no milestone.</p> <p>Year 2: The new VMS (or equivalent) system should have been selected and all components purchased. Commissioning and testing of the new system should be well underway (no score change).</p> <p>Year 3: The new VMS system should be fully operational on all vessels of the UoC (resulting score: 80)</p>
Client action plan	<p>Year 2. GATOSP will source new VMS service, accredited by fisheries department. The new system and service will be commissioned and tested to ensure proper functioning and confer with the required standard.</p> <p>Means of Verification: Service provider contract, correspondences</p> <p>Year 3. The new VMS will be fully operational on all vessels of the UOC BY 2021.</p> <p>Means of Verification: VMS report to SWG.</p>
Consultation on condition	Letters of support from Fishery Department.
Progress on Condition (Year 2)	<p>At the time of the surveillance audit, the Fisheries Department reported that the new VMS service is close to being fully operational across all vessels. VMS Maps were provided by the Guyana Fisheries Department as a means of verifying this (e.g. figure 2 below).</p> <p><i>Figure 3 VMS from Guyana Seabob vessels at ideal trawling speed, Nov 2020-Sep 2021</i></p>  <p>The map displays the coastline of Guyana and its Exclusive Economic Zone (EEZ) in blue. Red dots indicate the locations of seabob fishing activity between November 2020 and September 2021, showing a dense concentration along the coast. A yellow line represents the 8-9 fathom limit, and a red line indicates the ideal trawling speed of 3 knots. A scale bar shows 0, 0.25, and 0.5 miles. A north arrow is located in the top right corner.</p>
Progress on condition (year 3)	A section on VMS is presented within the 2021 Annual report by the Legal and Inspectorate Unit (Fisheries Department, 2021). It states: 100% of industrial trawl vessels, have been fitted with beacons and have since began transmitting. This is an important achievement considering the industrial seabob fleet was not monitored remotely during 2019 and parts of 2020, only traditional method were used i.e., log sheet submission and camera reviews. A map (Figure 1) is also provided in the report to show seabob fishing activity in 2021 using this VMS data.

	Stakeholders interviewed during the surveillance audit, including control authorities, stated that the VMS system has been fully operational since April 2022. The authorities are now moving to a real time response, previously this involved engaging with the companies who initially receive the data and pass to authorities 30 mins later.
Status	As the VMS system is now fully operational, as evidenced by the maps showing seabob fishing activity, the condition is CLOSED .

2.3.3 Recommendations

No new recommendations have been set by the surveillance team. Progress against existing recommendations is described below.

Recommendation 1	
Performance Indicator	PI1.2.2b: HCRs robustness to uncertainty
Purpose	To ensure that any changes in fishing capacity are taken into account when estimating fishing effort and CPUE
Recommendation	The assessment team recommends that information on vessel characteristics is obtained so that fishing effort can be standardised by vessel.
Client Action Plan	<p>A review of how changes in technology might impact variation in / changes to fishing capacity, and in turn how this might affect the adequacy of the current HCR and the estimation of fishing effort and CPUE will be an element included within the Terms of Reference provided to those undertaking the Peer Review of stock status (Condition 1).</p> <p>At the appropriate time – assumed to be during and following the external peer review of the stock assessment – this issue will be revisited by the SWG, and potentially raised as an issue with the Shrimp and Groundfish Working Group (SGWG) of the CRFM.</p>
Consultation on Recommendation	Letters of support from SWG, Fishery Department and GATOSP
Progress on recommendation	At the 2 nd surveillance audit, the Client Group noted that all companies have information on vessel characteristics including fishing power - there is a limit of 500 HP, but many only have 375 HP – and that any changes will be recorded. No formal inventory of vessels characteristics has yet been developed, and the Client Group reported that there had not been any progress this year.

Recommendation 2	
Performance Indicator	PI3.1.2a: Explicit definition of roles and responsibility
Purpose	To more clearly define roles and responsibility for all areas.

Recommendation	It has been concluded that functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction. It has also been concluded that these roles and responsibilities are enabling the management system to function well. At the time of assessment, a stock assessment has been effectively undertaken and a further stock assessment is being undertaken which will provide an update on stock status and inform the Harvest Control Rule and management of the fishery in the years ahead. However, the responsibility for who will undertake (and pay for) future stock assessments is not explicitly defined. Because the current system in relation to stock assessment appears to be working and the lack of explicit definition is unlikely to be an issue until the next scheduled stock assessment update (which may not be during this period of certification), this has not triggered a condition. However, it is strongly recommended that the future role is given explicit consideration.
Client Action Plan	A review of who will undertake (and pay for) future stock assessments will be included within the Terms of Reference provided to those undertaking the Peer Review of stock status (Condition 1). At the appropriate time this issue will be tabled and discussed by the SWG, and outcomes specified in the meeting minutes.
Consultation on Recommendation	Letters of support from SWG, Fishery Department and GATOSP
Progress on recommendation	The stock assessments for both the Guyana and Suriname seabob fisheries are currently undertaken by the same consultant. At present the assessments are planned every 5 years, but there is a desire for assessments to be undertaken more regularly, i.e. every 3 years. CRFM will coordinate any changes and it is planned that such stock assessments and their resourcing will be formally agreed by CRFM.

Recommendation 3	
Performance Indicator	PI3.2.3d: Accountability and transparency of management system and decision-making process
Purpose	To further improve the transparency (and therefore accountability) of the management system by improved information dissemination.
Recommendation	The website www.guyanaseabobfishery.com is an excellent potential resource to enable all stakeholders and others interested in the fishery to provide information about the management and performance of the fishery. In order to maximise this potential and increase the utility of the resource, a more comprehensive range of information about the fishery should be included on the website. Consideration should be given to how best to structure this in order to provide a useful directory of information. Key documents such as the stock assessment, the Seabob Management Plan, CPUE annual reports should certainly be made available and a wider range of documents (P2 research, VMS annual reports, working group minutes) could also be added. This should also be updated in a timely manner. This would improve the apparent transparency and accountability within the management system.

Client Action Plan	<p>The SWG will commission a report to the SWG proposing a programme of improvements to the Guyana seabob fishery website, including detailed plans for arrangement of document library, uploading protocols, and site visibility / accessibility – with decision on how to take this forward.</p> <p>Evidence of improvement to the website (scale and nature of content, accessibility, number of visitors to the site).</p>
Consultation on Recommendation	Letters of support from SWG, Fishery Department and GATOSP
Progress on recommendation	The website www.guyanaseabobfishery.com has been revamped with improved information resources. Stakeholders commented during the surveillance audit that it is proving useful for accessing material on the fishery and in promoting it to foreign interests.

Recommendation 4	
Performance Indicator	PI3.2.4a: Monitoring and Management Performance Evaluation: Evaluation coverage
Purpose	To participate in all opportunities to evaluate key parts of the fishery management system
Recommendation	There are frequently reviews of key parts of the fishery management system undertaken at a regional scale in the wider Caribbean or at the scale of the North Brazil Shelf LME. Both CRFM and WECAFC undertake reviews of certain aspects of fisheries management, capacity or governance in the region. A wider regional evaluation provides a valuable comparative review and enables best practice to be shared. Where possible every opportunity should be taken to participate in these reviews / evaluations.
Client Action Plan	<p>SWG will support and participate fully, as necessary, in the external peer review of the seabob fishery management plan (part of closing out Condition 1)</p> <p>SWG will review representation of its members at regional / international forums, and participation in regional projects, and discuss how it (and the Fishery Department) can step up its representation and its influence in such forums.</p>
Consultation on Recommendation	Letters of support from SWG, Fishery Department and GATOSP
Progress on recommendation	The revised general fisheries management plan and the revised specific fishery management plan for Guyana Seabob have been published in 2022.

Recommendation 5 (proposed at first surveillance in 2020)	
Performance Indicator	PI 1.2.4e. The assessment of stock status is subject to peer review
Purpose	To ensure that an expert external review of the new stock assessment methodology is undertaken.

Recommendation	The assessment team recommends that a stock assessment expert is commissioned to evaluate the new stock assessment model including testing the coding in the software and ensuring that the output from the model is reproducible.
Client Action Plan	The Guyana Government (Fisheries Department) will contact CRFM, FAO or other relevant fisheries body to arrange an external review of seabob stock assessments. CRFM, FAO or other relevant fisheries body will approach an external reviewer to evaluate the new stock assessment model including testing the coding in the software and ensuring that the output from the model is reproducible. External reviewer would be required to provide a report of the reviewed stock assessment.
Consultation on Recommendation	Letters of support from SWG, Fishery Department and GATOSP, meetings, emails, reports
Progress on recommendation	The Fisheries Department has commissioned a peer review of the most recent stock assessment of the Guyana seabob fishery (Vargas, 2022). The peer review concluded that the stock assessment was robust and the use of the assessment for fishery decision-making was a validation of the approach. The peer reviewer considered that a major strength in this stock assessment was the use of Stan software which “provides a flexible probabilistic programming language for statistical modeling along with a suite of inference tools for fitting models that are robust, scalable, and efficient.” The peer reviewer also highlighted the benefits of the most recent assessment of including improvements to the selectivity model and the interpretation of size classes. The peer reviewer made various recommendations for improving the approach including the collection of fishery-independent data, a re-evaluation of the measure of fishing effort, a greater understanding of catchability and therefore the relationship between CPUE and abundance and an improved estimate of natural mortality rate used in the model.

2.4 Client Action Plan

Updates to the Client Action Plan were required to meet the revised milestones. The client reviewed and updated the CAP accordingly.

3 Appendices

3.1 Evaluation Processes and Techniques

3.1.1 Site Visits

Stakeholder notification was issued inviting a range of stakeholders to provide information and comments on the fishery. Several key stakeholders were contacted directly to request a meeting, resulting in the meetings being arranged and conducted as detailed below.

The assessment team made an off-site surveillance audit involving Microsoft Teams calls with stakeholders on 5th December 2022, attended by the lead assessor and P1 & P2 team member.

3.1.2 Stakeholder participation

Stakeholder notification was issued inviting a range of stakeholders to provide information and comments on the fishery. Several key stakeholders were specifically contacted to request a meeting and most of those responded. The team conducted remote meetings with the following stakeholders:

Name	Position	Organisation
Desha Husbands-Spellen	Fisheries Officer	Fisheries Department
Mikhail Amsterdam	Fisheries Officer	Fisheries Department
Denzil Roberts	Chief Fisheries Officer	Fisheries Department
Randy Bumbury	Fisheries Officer	Fisheries Department
Carlos Ross	Wing Sargent	Guyana Police
David Shamcudeen	Lt. Commander	Coastguard
Reuben Charles	President GATOSP	GATOSP
Dawn Maison	Seabob Working Group Secretary	GATOSP
Diana Fernandes	Regional conservation officer	World Wide Fund for Nature
Aisha Williams	Country Manager	World Wide Fund for Nature

3.2 Stakeholder Input

No submissions from stakeholders were received.

3.3 Revised surveillance programme

The surveillance programme was revised to an off-site surveillance for year 3 as milestones could be evidenced remotely using information provided by the client and stakeholder interviews.

Year	Surveillance activity	Number of auditors	Rationale
1, 2 & 3	Off-site audit	2 (required as this is initial certification period) as per FCP7.28.6.1	Relatively few of the conditions require any material changes in operation or physical changes which must be verified by site visit. By contrast, documentary evidence of actions undertaken may provide an objective basis to assess progress against milestones. In most cases milestone in year 1 requires review, and milestone in year 3 relates to commencing the process of implementation. No score changes are anticipated in years 1 and 2. By year 3 actions to address all conditions should be well underway and initial review and work to address gaps should be largely complete and moving into the implementation phases. Originally it was considered useful to have an on-site surveillance at this point to verify progress, but with continuing restrictions due to Covid-19 and the implementation of MSC Derogation 6 under which it was not a requirement to formally evaluate conditions against milestones, the site visit was changed to a remote visit conducted under Microsoft TEAMS.
4	On-site audit	2 (required as this is initial certification period) as per FCP7.28.6.1	Final implementation and completion of all conditions is scheduled for year 4. As a result, score changes are anticipated to occur in year 4. Therefore, an on-site surveillance will be important at this point to verify implementation. This also coincides with meetings to commence recertification (if the client wishes to continue).

Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of remaining surveillance audits	Rationale
All years 2020-24	August	4 th surveillance: February 2024	No annual scientific advice, so timing of surveillance expected to be in-line with the anniversary of certification. The time between surveillance audits is affected by the 6 months extension of the Certificate, expiring February 2025. Precise timing of on-site surveillance will take into account the resumption of fishing after each annual break.

Fishery Surveillance Program*

Surveillance Level	Year 1	Year 2	Year 3	Year 4
Level 3	Off site surveillance audit	Off-site surveillance audit	Off-site surveillance audit	On-site surveillance audit & re-certification site visit

3.4 Harmonised fishery assessments

Contact was made with the CAB for the certified Suriname Seabob fishery. It was agreed that a potential requirement for harmonisation exists if the Suriname and Guyana fisheries were exploiting the same stock. Currently the monitoring, stock assessment and management regimes are entirely separate, so they are essentially considered as separate stocks. A recent PhD study by Kerkhove (2020) concluded that there is one single genetic population of seabob across the Guianan Ecoregion and it is likely that this genetic population structure is also reflected in the regional population structure.

The Assessment Teams for the Guyana and Suriname fisheries recognised that for many fisheries there is not always a direct overlap of the genetic stock with the assessment and management regime. Stocks are often assessed and managed in a pragmatic way even though the fishery may be exploiting only part of the stock, or in some cases more than one genetic stock. The respective assessment teams consider that the current approach whereby the stock assessment modelling in Suriname and Guyana is based upon two separate management units rather than genetically different stocks remains valid but will be kept under review.

Julian Addison is also the P1 for the Suriname seabob fishery, which will facilitate harmonisation should this be necessary.

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