

Control Union (UK) Limited

Reunion Island Swordfish Longline Fishery

MSC Use of the Risk-Based Framework (RBF) in a Fishery Assessment

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1 Marine Stewardship Council use of the Risk-Based Framework

Table 1 – Fishery information

1	Fishery name
Reunion Island Swordfish longline fishery	
2	CAB
Control Union (UK) Limited	
3	Date that the proposal to use the RBF is submitted to the MSC
17:00 UTC on the 02/07/2021	
4	Date stakeholder comment period closes on the proposal to use the RBF
17:00 UTC on the 01/08/2021	
5	PI that the RBF is to be applied for
PI 2.2.1 (Secondary species outcome)	
6	Justification for use
<p>PI 2.2.1 (Secondary species outcome)</p> <p>The ‘main’ secondary species identified at the ACDR stage included blue shark, shortfin mako shark, dolphinfish and purpleback flying squid (bait). Except for blue shark, the absence of stock assessments or information on biologically-based limits, means that the RBF should be triggered for those scoring elements. However, following submission of new data after ACDR publication and prior to the site visit taking place, the assessment team determined that the RBF was no longer required for shortfin mako shark or dolphinfish. Furthermore, a new ‘main’ secondary species was identified for which the absence of stock assessments or information on biologically-based limits meant the RBF will be required; this is the Japanese flying squid (<i>Todarodes pacificus</i>) used as bait.</p> <p>The RBF will therefore be applied to the following two secondary (bait) species:</p> <ul style="list-style-type: none"> • purpleback flying squid (<i>Sthenoteuthis oualaniensis</i>), caught in FAO71 (Vietnam) • japanese flying squid (<i>Todarodes pacificus</i>), caught in FAO61 (China) <p>Gear types concerned:</p> <ul style="list-style-type: none"> • Jigging line • Mid-water trawl 	

- | | |
|--|--|
| | <ul style="list-style-type: none">• Gillnets / entangling nets |
|--|--|

A key purpose of the site visit is to collect information and speak to stakeholders with an interest in the fishery. For those parts of the assessment involving the MSC's Risk-Based Framework (RBF, see msc.org), we will be using a stakeholder-driven, qualitative and semi-quantitative analysis. To achieve a robust outcome from this consultative approach, we rely heavily on participation of a broad range of stakeholders with a balance of knowledge of the fishery. We encourage any stakeholders with experience or knowledge of the fishery to participate in these RBF analysis. Stakeholders wishing to be involved should review the information provided below and return answers to the questions posed in Section 10 to CU (UK), using the email address provided on the first page of this notification by **17:00 UTC on the 01/08/2021**. Stakeholders who complete this questionnaire will also be offered the opportunity to discuss this RBF at a meeting as requested.

**Marine Stewardship Council (MSC) Risk Based Framework
Stakeholder Input**

Secondary species

Reunion Island Swordfish Longline Fishery

Prepared by

Control Union (UK) Limited

June 2021

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QA

Role	Signature	Date
Originator:	CS	1 st July 2021
Reviewer:	HE	1 st July 2021
Approver:	TT	2 nd July 2021

1 Background

Following analysis of data records at the ACDR stage of the MSC full assessment of the Reunion Island swordfish longline fishery, two secondary main species (used as baits) were identified:

- purpleback flying squid (*Sthenoteuthis oualaniensis*) – FAO 71 (Vietnam)
- Japanese flying squid (*Todarodes pacificus*) – FAO 61 (China)

No biologically based limits are available for those stocks, derived either from analytical stock assessment or using empirical approaches. As such CU (UK) are required to announce the use of RBF for PI2.2.1 for these elements.

The gear types are:

- Japanese flying squid (*Todarodes pacificus*) – FAO 61 : Gillnets and entanglings nets, hooks and lines (jigging lines), midwater trawls. (source. https://www.fishsource.org/stock_page/1183)
- purpleback flying squid (*Sthenoteuthis oualaniensis*) – FAO 71 : jigging lines

As per the requirements of Annex PF of the MSC FCP2.2., the required approach for PI 2.2.1 is use of the Productivity Susceptibility Analysis (PSA). The PSA is a tool that can be used by MSC Assessment Teams to assess the risk posed by a fishery to species for which there is only limited information available. The RBF process is intended to gather and use information from stakeholders in a structured manner; it is also intended to produce a more precautionary assessment of impact than if the MSC's default assessment tree is employed. We have tried to simplify the PSA process to produce this questionnaire, but there is still some complexity in the process. Where we ask for information from stakeholder on areas of this PSA we have highlighted this in **green highlight**.

If you have any queries about the MSC process, you can find more information at the MSC website (www.msc.org), including information about the fishery (<https://fisheries.msc.org/en/fisheries/reunion-island-swordfish/@@view>); alternatively, you can get in touch with us directly (using the contact details below). The MSC also provides an official template for stakeholder comments, to use if you have views on this aspect of the fishery; it can be downloaded at <http://www.msc.org/documents/get-certified/stakeholders>. Thank you for taking the time to participate in this assessment.

2 Stakeholder information

Before you start the questionnaire, please provide us with your contact details so that we can keep in touch with you as the assessment of the fishery proceeds through its different steps. This will ensure that you are kept fully up to date with progress and that you have further opportunities to participate in the assessment process.

We respect your privacy and security and will only use this information in accordance with the statement below and in compliance with EU GDPR.

3 Privacy, Transparency and Confidentiality

1. We ask for your e-mail address in case we need to contact you for clarification of your comments.
 2. The MSC process requires assessment inputs to be transparent and verifiable. We will list you as a stakeholder that has contributed to this assessment and may publish your interview response in assessment documents.
 3. Your privacy is important to us. We will not publish your e-mail address, nor will we share it with any third parties.
- In accordance with the statement above, please provide the following information:

Name:

Company/Organisation:

City/Town:

Country:

Email Address:

Phone Number (please include international code):

4 Principle 2

Catch profiles and data availability

Data available within this assessment correspond to the quantity of bait consumed within the Reunion Swordfish longline fishery. Both squid species are imported by the fishery from respectively China and Vietnam and used as bait on the longlines. There are limited data available on the two stocks concerned, with stock assessments being outdated and data being very generic (data not available to the species level or gear type) (see. Fang et al. 2018).

5 Supporting information

The table below shows the stock and gear combination under consideration for the RBF stakeholder input

Table 1. Overview of two main secondary species for UoAs identified at ACDR.

FAO 61
Japanese flying squid – (<i>Todarodes pacificus</i>) – trawl, jigging line, purse seine
&
FAO 71
Purpleback flying squid – (<i>Sthenoteuthis oualaniensis</i>) – jigging line

In line with Annex PF of the MSC Fisheries Certification Process FCP 2.2, the following information should be provided to stakeholders prior to the RBF workshop taking place:

- Management arrangements in place together with any specific strategies, such as bycatch mitigation or recovery strategies
- Descriptions of any monitoring strategies in place, including at-sea observer programmes (coverage, duration, objectives).
- Maps of the distribution of fishing effort within the jurisdictional boundaries of the fishery
- Maps of distribution of all fishing effort on the target stock outside the fishery being certified
- Species, habitat and community distributions (including depth ranges)

Management systems

No true management systems are in place for any of the species. There is some minimum mesh size in place in China regarding their trawling fleet but nothing else is in place in terms of measures for the other gear used. The situation appears to be similar in Vietnam.

Monitoring strategies

For both species, there is not much monitoring taking place with even stock assessments not being carried out on a regular basis.

6 Guide to PSA

The PSA is described in detail in the MSC Fisheries Certification Process V2.2 (Annex PF4, MSC 2018). In summary, the data required for the PSA are divided in to two sections, one covering ‘productivity’ attributes (which effectively describe the biological attributes of the species’, and one covering ‘susceptibility’ attributes (which effectively describe the potential for interaction between the species and the UoA).

The productivity attributes for a species are species-specific and do not change between fisheries, and the Assessment Team has already derived productivity information for each species from available online sources.

Information and provisional scoring of ‘Productivity’ is provided in the following sections. We request that you review this information and confirm that you agree with the Assessment Team’s findings, or otherwise.

Information of “Susceptibility” is provided in the following sections. Please, review the ‘Susceptibility’ information provided and please use the space provided to draft your own scores for susceptibility to support finalisation of the PSA scores for the species under review.

7 Susceptibility attributes and scores

A few guidance notes have been listed below to aid stakeholders in the completion of the susceptibility questionnaire. Please note that this guidance is not exhaustive and stakeholders are encouraged to consult the MSC Fisheries Certification Requirements v2.01 (Annex PF).

Table: PSA susceptibility attributes and scores (extract from MSC FCRv2.0, Annex PF)

Susceptibility attribute	Low susceptibility (Low risk, score=1)	Medium susceptibility (medium risk, score=2)	High susceptibility (high risk, score=3)
Areal overlap (availability) Overlap of the fishing effort with a species concentration of the stock	<10% overlap	10-30% overlap	>30% overlap
Encounterability The position of the stock/species within the water column relative to the fishing gear, and the position of the stock/species within the habitat relative to the position of the gear	Low overlap with fishing gear (low encounterability)	Medium overlap with fishing gear	High overlap with fishing gear (high encounterability) Default score for target species (P1)
Selectivity of gear type Potential of the gear to retain species	a Individuals < size at maturity are rarely caught	a Individuals < size at maturity are regularly caught	a Individuals < size at maturity are frequently caught
	b Individuals < size at maturity can escape or avoid gear	b Individuals < half the size at maturity can escape or avoid gear	b Individuals < half the size at maturity are retained by gear
Post-capture mortality (PCM) The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Evidence of majority released postcapture and survival	Evidence of some released postcapture and survival	Retained species or majority dead when released Default score for retained species (P1 or P2)

Where there is limited information available to score a susceptibility attribute, the more precautionary score shall be awarded

Aerial overlap:

- Where the impacts of fisheries other than the UoA are taken into account, the areal overlap shall be scored as the combined overlap of all listed fisheries with the areal concentration of a stock
- The scoring of areal overlap shall consider the concentration of species and the overlap of the fishing gear with the concentration species

Encounterability:

- Where the impacts of fisheries other than the UoA are taken into account, encounterability shall be scored as the combined encounterability of all listed fisheries
- The scoring of encounterability shall consider the concentration of species and the overlap of the fishing gear with the concentration species
- The deployment of fishing gear in relation to each species adult habitat is the main aspect to be considered for each species

Gear selectivity:

'Rarely' means that the capture of individuals smaller than the size at maturity occurs in less than 5% few gear deployments.

'Regularly' means that the capture of individuals smaller than the size at maturity occurs in 5% to 50% of the gear deployments.

'Frequently' means that the capture of individuals smaller than the size at maturity occurs in more than 50% of gear deployments.

Post-capture mortality:

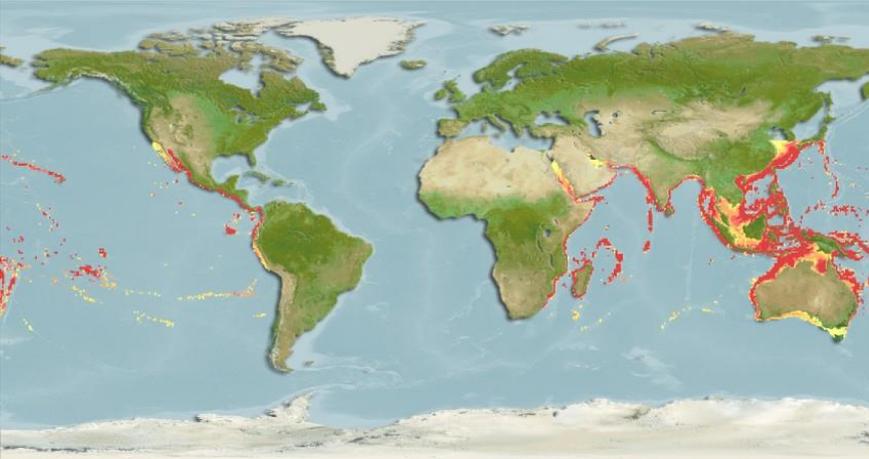
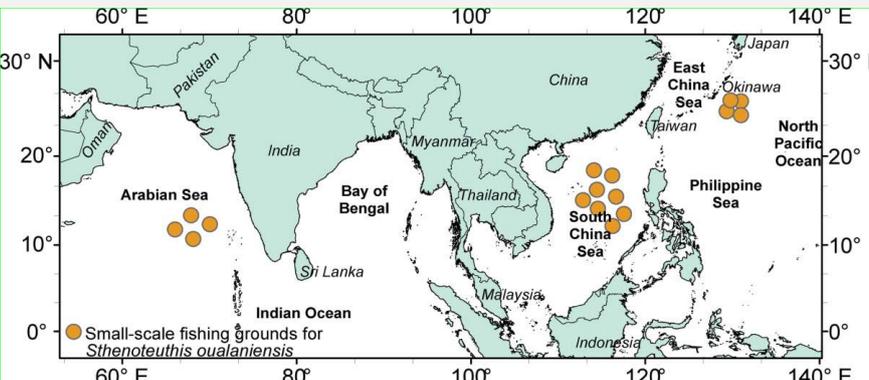
- The team shall use its knowledge of species biology and fishing practice together with independent field observations to assess the chance that, if captured, a species would be released and that it would be in a condition to permit subsequent survival

- In the absence of observer data or other verified field observations made during commercial fishing operations that indicate the individuals are released alive and post-release survivorship is high, the default value for the PCM of all species shall be high

8 Purpleback flying squid – (*Sthenoteuthis oualaniensis*)

Table 2. Productivity Susceptibility Analysis for Purpleback flying squid – (*Sthenoteuthis oualaniensis*)

Performance Indicator	2.2.1	
Productivity		
Scoring element (species)	Purpleback flying squid (<i>Sthenoteuthis oualaniensis</i>)	
Attribute	Rationale	Score
Average age at maturity	136 days (females) 85 days (males) Source: Liu et al. 2017	1
Average maximum age	5-6 months Source: Liu et al. 2017	1
Fecundity	63 000 - 97 000 Source: Su et al. 2016	1
Average maximum size Not scored for invertebrates	NA	NA
Average size at maturity Not scored for invertebrates	females = 183 mm ML (Mantle Length) males = 156 mm ML (Mantle Length) Source: Liu et al. 2017	NA
Reproductive strategy	Demersal egg layer	2
Trophic level	2.9 Source: Huang et al. 2019	2
Density dependence Invertebrates only	No dependasatory or compensatory dynamics demonstrated or likely Source: Rodhouse et al. 2014	2
Productivity score		1.50
Susceptibility		
Attribute	Rationale	Score

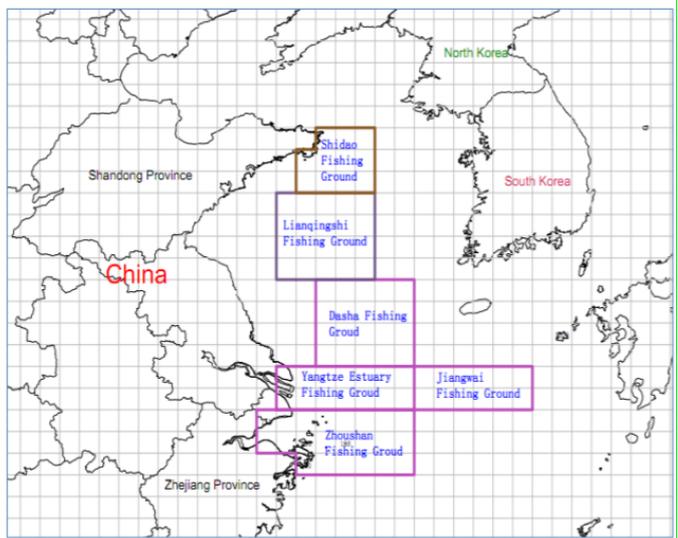
<p>Areal Overlap</p>	 <p>Purpleback flying squid distribution (source: sealifebase.ca). The species is mainly distributed in the Indo-Pacific.</p>  <p>Map of the main smallscale fisheries targeting the species using automatic squid jigging, light-attraction falling nets and hand jigging.</p> <p>The Vietnamese fishery where the purpleback flying squid (used as bait in the Reunion swordfish fishery) comes from, is targeting the species. There is therefore a high risk of high overlap (>30% overlap) of the Vietnamese fishery with the area where the species is most commonly found. This is therefore scored precautionarily.</p>	<p>3</p>
<p>Encounterability</p>	<p>Similar to the previous point, within the Vietnamese fishery, the purpleback flying squid being targeted, there is a high overlap (high encounterability) with the fishing gear.</p>	<p>3</p>
<p>Selectivity of gear type</p>	<p>Jigging line: Not very selective within the species. Study from Zhao et al. 2021 did some sampling on the purpleback flying squid stock in the South China Sea and most individuals caught are below the size at maturity indicated by Liu et al. 2017.</p>	<p>3</p>
<p>Post capture mortality</p>	<p>Purpleback flying squids are used as bait in the Reunion Swordfish fishery therefore default score of 3 applies here.</p> <p>Same for the source fishery as so far no evidence could be found on discards or survivability.</p>	<p>3</p>
<p>Susceptibility score</p>		<p>3.00</p>
<p>Overall PSA score</p>		<p>3.35</p>

MSC score	60-79
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9 Japanese flying squid – (*Todarodes pacificus*)

Table 3. Productivity Susceptibility Analysis for Japanese flying squid (*Todarodes pacificus*)

Performance Indicator	2.2.1	
Productivity		
Scoring element (species)	Japanese flying squid (<i>Todarodes pacificus</i>)	
Attribute	Rationale	Score
Average age at maturity	4-5 months Source: Takahara et al. 2017	1
Average maximum age	<1 year Source: https://s3-us-west-2.amazonaws.com/staticassets.oceanoutcomes.org/supporting+documents/Fishery+Project+Resources/O2+Chinese+JFS+Fishery+Improvement+Scoping+Report+-+December+Revised+2018+FINAL.pdf	1
Fecundity	100000 – 200000 eggs Source: Bower and Sakurai 1996	1
Average maximum size Not scored for invertebrates	NA	NA
Average size at maturity Not scored for invertebrates	NA	NA
Reproductive strategy	Demersal egg layers Source: https://s3-us-west-2.amazonaws.com/staticassets.oceanoutcomes.org/supporting+documents/Fishery+Project+Resources/O2+Chinese+JFS+Fishery+Improvement+Scoping+Report+-+December+Revised+2018+FINAL.pdf	2
Trophic level	4.28 Source: https://www.sealifebase.se/Ecology/FishEcologySummary.php?stockcode=4344&genusname=Todarodes&speciesname=pacificus&lang=french	3
Density dependence Invertebrates only	No dependatory or compensatory dynamics demonstrated or likely Source: Rodhouse et al. 2014	2
Productivity score	1.67	

Susceptibility		
Attribute	Rationale	Score
Areal Overlap	 <p>Figure 3. - Distribution of the Japanese flying squid population, marked in red on the map.</p> <p>Based on Figure 3, it is clear that most of the stock is contained within the FAO 61 area (dashed line – left corner).</p>	3
	 <p>Figure 4. – Japanese Flying Squid (JFS) fishing grounds within the China's EEZ.</p>	

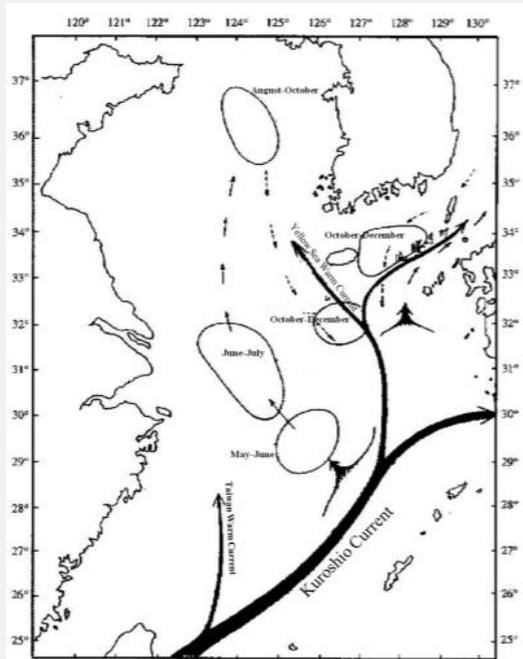


Figure 5. – Migration route of Japanese Flying Squid (winter stock). (source: Fang 2018).

Based on the previous Figures (3, 4 and 5) it appears that the overlap between the fishery and the JFS stock is very high in the East China and Yellow Seas.

There is also some fishing undertaken in the South of the Sea of Japan as reported by Fang et al. 2018 and Arkhipkin et al. 2015. (see Figure 6)

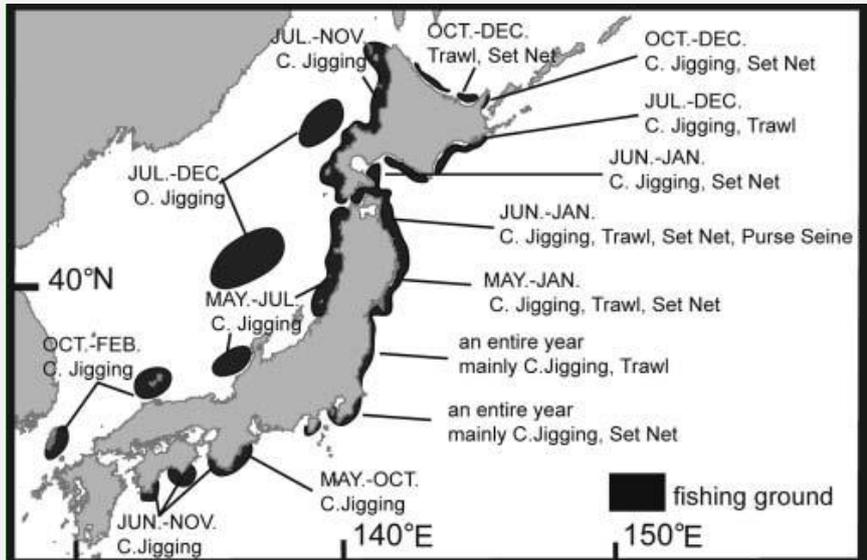


Figure 6. - Main fishing grounds and fishing season for *Todarodes pacificus* around Japanese waters. (source: Arkhipkin et al. 2015).

There are therefore some high chances for a high risk of overlap between the fishery and the species stock. A precautionary approach was adopted here.

Encounterability	Within the Chinese fishery, the purpleback flying squid being targeted, there is a high overlap (high encounterability) with the fishing gear.
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Selectivity of gear type	<p>Trawls: With only a 54mm mesh regulation in China and average size at maturity being between 240 and 330 mm (Fang et al. 2018) there is not much selectivity from the gear here, which might catch immature individuals.</p> <p>Seines: no information on mitigation or on catch selectivity</p> <p>Jigging (Sea of Japan): similar as for the purpleback flying squid, not much selectivity here within the species for this type of gear which might end up catching immature individuals.</p>	3
Post capture mortality	<p>Japanese flying squid are used as bait in this fishery.</p>	3
Susceptibility score		3.00
Overall PSA score		3.43
MSC score		60-79

10 Stakeholder comments on Purpleback flying squid – (*Sthenoteuthis oualaniensis*) & Japanese flying squid (*Todarodes pacificus*) PSAs

- 1) Are there any 'Productivity' provisional scores that you do not agree with?
- 2) If you disagree with any provisional score, please provide your score and any supporting information with references if available.
- 3) Are there any 'suspectibility' provisional scores that you do not agree with?
- 4) If you disagree with any provisional score, please provide your score and any supporting information with references if available.