Australian Eastern Tuna and Billfish Fishery

Public Comment Draft Report

Conformity Assessment Body (CAB)	bio.inspecta (mandated by q.inspecta)
Assessment team	Dr. Sabine Daume Mr. Alexander Morison Dr. Johanna Pierre Ms. Sascha Brand-Gardner
Fishery client	Tuna Australia Limited
Assessment Type	First Reassessment

1 Contents

2 Glossary

ABARES	Australia Bureau of Agriculture and Resource Economics and Sciences
ACAP	Agreement on the Conservation of Albatrosses and Petrels
ACDR	Announcement Comment Draft Report
AFMA	Australia Fisheries Management Authority
AFZ	Australian Fishery Zone
BLIM	Biomass limit
BTARG	Biomass target
CCM	Commission Members, Cooperating Non-Members and participating Territories
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CDS	Catch Documentation Scheme
CHSP	Commonwealth Harvest Strategy Policy
CMM	Conversation Management Measure
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CPUE	Catch Per Unit Effort
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Department of Agriculture, Fisheries and Forestry
DAWE	Department of Agriculture, Water and the Environment
DAWR	Department of Agriculture and Water Resources
DoA	Department of Agriculture
DOE	Department of Environment
DOEE	Department of Environment and Energy (now DAWE effective 1 Feb 2020)
EAC	Eastern Australia Current
EEZ	Exclusive Economic Zone
EPBC	Environmental Protection and Biodiversity Conservation Act
EPO	Eastern Pacific Ocean
ERA	Ecological Risk Assessment
ERM	Ecological Risk Management
ESD	Ecologically Sustainable Development
ETBF	Eastern Tuna and Billfish Fishery
ETP	Endangered, Threatened and Protected Species
FAA	Fisheries Administration Act
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organisation of the United Nations
FFA	Forum Fisheries Agency

FMA	Fisheries Management Act
FMS	Fishery Management Strategy
FO	Fisheries Officers
FRDC	Fisheries Research and Development Corporation
IATTC	Inter-American Tropical Tuna Commission
ISC	International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean
IUCN	International Union for Conservation of Nature and Natural Resources
IUU	Illegal, unreported and unregulated
MAC	Management Advisory Committee
MEY	Maximum Economic Yield
MSY	Maximum Sustainable Yield
MP	Management Plan
MSE	Management Strategy Evaluation
NSW	New South Wales
OCS	Offshore Constitutional Settlement
OFP	Ocean Fisheries Programme
PNA	Parties to the Nauru Arrangement
PRI	Point of Recruitment Impairment
PSA	Productivity-Susceptibility Analysis
RAG	Research Assessment Group
RFMO	Regional Fisheries Management Organisation
SAFS	Status of Australian Fish Stocks
SBT	Southern Bluefin Tuna
SBTF	Southern Bluefin Tuna Fishery
SBTMAC	Southern Bluefin Tuna Management Advisory Committee
SC	Scientific Committee
SFR	Statutory Fishing Right
SIDS	Small Island Developing States
SI	Scoring Issue
SPC	Secretariat to the Pacific Community
TA	Tuna Australia
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
TTMAC	Tropical Tuna Management Advisory Committee
TTRAG	Tropical Tuna Research Assessment Group
UNLCOS	United Nations Convention on the Law of the Sea
UoC	Unit of Certification
VDS	Vessel Day Scheme
VME	Vulnerable Marine Ecosystems
VMS	Vessel Monitoring System
WCPFC	Western Central Pacific Fisheries Commission
WCPO	Western Central Pacific Ocean
WSA	Walker Seafoods Australia
WTBF	Western Tuna and Billfish Fishery
WTO	Wildlife Trade Operation

3 Executive summary

To be completed at Public Certification Report stage

This report is the Public Comment Draft Report which provides details of the MSC reassessment process for Walkers Seafood Australian albacore, yellowfin tuna and swordfish longline fishery. Bigeye tuna has been added as a target species and the wider Australian tuna fleet is now part of the UoC. The fishery has therefore been renamed the Australian Eastern Tuna and Billfish Fishery. The assessment process began with publication of the ACDR in November 2019 and is due to be concluded in August 2020. The site visit was held in Mooloolaba, Australia, between the 11 -12th February 2020.

This report has been reviewed by the peer reviewers and the client, but it does not present a certification decision.

Fishery strengths

Principle 1:
For all PI species there are comprehensive data collection systems at the WCPFC and Australian levels that support robust stock assessments. All stocks have been assessed as being well above the PRI and above MSY. The catch by the ETBF fleet is controlled by conservatively set TACCs and its activities are closely monitored. The WCPFC has a workplan for the development of harvest strategies for tuna species, and a new harvest strategy is under development for use in the ETBF for Broadbill Swordfish and Striped Marlin.

Principle 2:

- The framework for managing Principle 2 elements is robust, and the use of ecological risk assessment supports this effectively.
- Monitoring of the non-target and ETP catch in the fishery is supported by human observers and electronic monitoring, which enables verification of fisher-reported information (e.g. logbook declarations and catch disposal records for non-target retained species).
- There is a significant body of fishery dependent and independent information available with which to assess and manage the environmental effects of fishing.

Principle 3:

- The fishery is managed under Australian legislation, which meets the requirements of international conventions, specifically, the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western Central Pacific Ocean.
- There is a high level of co-operation and participation between the governing bodies e.g. Australian agencies and the Western Central Pacific Fisheries Commission and associated Committees.
- There is 100% electronic monitoring on all UoC vessels.

Fishery weaknesses

Principle 1:
For all the P1 species, there are no harvest strategies in place at the WCPFC level and no agreed harvest control rules that operate to control fishing across the range of each stock. In addition, for yellowfin tuna, the stock has been assessed as having been steadily depleted and it is not yet clear whether this trend will be halted.

Principle 2:
A wide variety of non-target and ETP species are caught. Typically, these species have distributions extending significantly beyond the area of operation of the UoAs. Knowledge gaps in relation to stock status and biological processes create challenges for management. (For example, where the connectivity of populations inside and outside the UoA's area of operation is unknown).

Conditions & Recommendations

Bio.inspecta confirm that this fishery is "within scope", which means that it meets the eligibility criteria to enter the MSC assessment process. Once that process is completed the team will make a determination of whether or not the fishery meets the MSC Standard. Nine conditions were place on the fishery after completing the scoring, eight under Principle 1 and one under Principle 2.

4 Report details

4.1 Authorship and peer review details

Together the team meets all competency requirements laid out in FCP v2.1 Section(s) 7.6, 7.14, Annex PC Table PC3.

Team Leader: Dr Sabine Daume

Dr. Daume is the Managing Director of bio.inspecta Pty Ltd, Centre for Seafood Certification based in Australia which covers MSC, ASC and Fisheries Improvement programs. Since 2009, Dr. Daume has led numerous MSC evaluation audits including several large and controversial assessments, and many assessments in Australia.

Dr. Daume led the WA rock lobster and Heard Island and McDonald Islands (HIMI) icefish annual surveillance and re-assessments as well as the HIMI and Macquarie Island toothfish full assessment in Australia, and numerous audits in USA, Canada, Mexico and Japan. Dr. Daume led the PNA surveillance audits and expedited P! assessment for yellowfin tuna of the PNA fishery in 2014-2015 and 2016. She also successfully led five new full assessments in Western Australia in 2015 and 2016 (Peel Harvey Estuarine Fishery, West Coast Deep Sea Crab Fishery, Australian Silver-lipped Pearl Fishery, Western Australian Abalone Fishery, Western Australian Octopus Fishery). She has been trained by the MSC to use the Risk Based Framework (RBF) and the most recent MSC Certification Requirements (v2.0 Oct. 2015). She is a certified lead auditor under the ISO 9001:2008 standard.

She holds a PhD in marine biology from La Trobe University in Victoria, Australia and an MSc in Marine Biology and Marine Chemistry from Kiel University in Germany. Dr. Daume has expertise in the biology and ecology of exploited marine resources. Dr. Daume has over 25 years' experience working with the fishing and aquaculture industry in Australia and worked as a Senior Research Scientist at the Research Division of the Department of Fisheries in Western Australia.

Principle 1 Expert: Alexander (Sandy) Morison

Mr. Morison is a consultant specializing in fisheries and aquatic sciences. He has over 30 years' experience in fishery science and assessment at state, national and international levels and has held senior research positions for state and national organizations in Australia. He is currently chair of the Ecologically Related Species Working Group of the Commission for the Conservation of Southern Bluefin Tuna and has been engaged in the Kobe process for harmonisation of measures across the tuna RFMOs. Sandy is also contracted by the Australian Fisheries Management Authority to chair the Slope Fisheries Resource Assessment Group, the Shelf Fisheries Resource Assessment Group and is the Scientific Representative on the South East Fishery Management Advisory Committee. He has also been the scientific representative on other Resource Assessment Groups. Sandy has experience with the assessment of invertebrate, chondrichthyan and teleost fisheries including commercial and recreational fisheries in freshwater, estuarine and marine habitats and fisheries operating in tropical, temperate and polar environments.

Mr. Morison has participated as part of a team undertaking MSC pre- and full assessments for many fisheries including tuna fisheries in the South Pacific. He has been the Principle 1 expert for the MSC certification assessments or surveillance audits of assessments of the Heard Island and McDonald Islands (HIMI) Icefish Fishery, the HIMI Toothfish Fishery, the Macquarie Island Toothfish Fishery, the Kyoto Danish Seine Fishery, the Western Australian Rock Lobster Fishery and the Lakes and Coorong Fishery. Mr Morison is also trained as a lead auditor for MSC assessments.

Mr Morison has worked on an assessment of the ecological risks from Queensland's East Coast Trawl Fishery that looked at the full range of ecological components as well as a separate assessment of this fishery's vulnerability to climate change. He has expertise with fish age and growth and has been

involved in the development and implementation of harvest strategies for several fisheries. He has over 20 publications in peer-reviewed scientific journals (8 as senior author), 8 book chapters, and over 100 project reports, technical reports, client reports and papers in workshop and conference proceedings.

Principle 2 Expert: Johanna Pierre

Dr. Johanna Pierre has more than 15 years' experience working on commercial fishing, in marine and freshwater environments. Her work includes fisheries management, policy, regulation and monitoring. She also conducts sustainability assessments, audits and evaluations of fishery and environmental performance. Johanna has worked for government, academia, non-profit organisations and industry. She has a Ph.D. in environmental biology and ecology (University of Alberta, Canada), and a B.Sc. (Hons) (University of Canterbury, New Zealand) and completed post-doctoral studies at the University of Tokyo (Japan). Johanna has extensive experience working on fisheries and other fields of science in Canada, Japan, China, South Korea, Australia and New Zealand.

Johanna is a certified MSC fishery team member, Chain of Custody auditor, and member of the MSC Peer Review College and Technical Consultants Register. She is trained in the use of the MSC Risk Based Framework. Johanna's experience covers MSC peer reviews (P1, P2, P3), surveillance audits (P1, P2, P3, including as team leader), fishery assessments (P2, P3), and fishery pre-assessments (P1, P2, P3). Recent work includes longline, pole and line, trawl and purse seine fisheries, both in fisheries under national jurisdiction and those managed by multilateral bodies (such as Regional Fisheries Management Organisations).

Principle 3 Expert: Sascha Brand-Gardner

Ms. Brand-Gardner is a Seafood Program Associate and Lead Auditor at bio.inspecta Pty Ltd, Centre for Seafood Certification, based in Australia and has over 20 years of experience working in fisheries policy, ecosystem-based fishery management and marine research. She was a senior fishery manager at the Department of Primary Industries and Regional Development - Fisheries Division in Western Australia (WA) and managed several prawn and scallop trawl and large pelagic line fisheries as well as multi-species ornamental fisheries. Prior to this, she worked on several marine research projects related to endangered, threatened and protected species, fishery habitats, abalone and the environmental impacts of aquaculture.

Sascha has an Honours degree in Marine Zoology (The University of Queensland), has been trained by the MSC to use the most recent MSC certification requirements and the risk-based framework and is a certified lead auditor under the ISO 9001:2015 standard. Sascha has been the Team leader and/or Principle 3 expert for the MSC certification of several AFMA managed fisheries including the Australia Blue Grenadier Fishery in 2015 and the Heard and McDonald Islands and Macquarie Island toothfish re-assessments in 2016. Sascha has been involved in the surveillance audits of longline (e.g. tuna and swordfish), trawl (e.g. blue grenadier) and rake fisheries (South Australian pipi) and pre-assessments of purse seine and trawl fisheries.

Peer Reviewer

The MSC Peer Review College proposed four peer reviewers for this assessment which can be found at https://fisheries.msc.org/en/fisheries/australian-eastern-tuna-and-billfish-fishery-albacore-tuna-yellowfin-tuna-bigeye-tuna-and-swordfish/@@assessments. Two peer reviewers were selected from the shortlisted candidates.

4.2 Version details

Table 1 – Fisheries program documents versions	
Document	Version number
MSC Fisheries Certification Process	**Version 2.1**
MSC Fisheries Standard	**Version 2.01**
MSC General Certification Requirements	**Version 2.4**
MSC Reporting Template	**Version 1.0**

5 Unit(s) of Assessment and Certification and results overview

5.1 Unit(s) of Assessment and Unit(s) of Certification

5.1.1 Unit(s) of Assessment

Table 2 – Unit(s) of Assessment (UoA)	
UoA 1	Description
Species	Yellowfin tuna (*Thunnus albacares*)
Stock	South Pacific albacore
Geographical area	FAO Area 71 81, and 57.6. East coast of Australia, inside the Australian Fishery Zone (AFZ) and adjacent high seas areas.
Harvest method / gear	Pelagic mid-set longline
Client group	All vessels participating in the ETBF
Other eligible fishers	All fishers included in UoA
UoA 2	Description
Species	Albacore tuna (*Thunnus alalunga*)
Stock	Western and Central Pacific yellowfin
Geographical area	FAO Area 71, 81, and 57.6 East coast of Australia, inside the Australian Fishery Zone (AFZ) and adjacent high seas areas
Harvest method / gear	Pelagic mid-set longline
Client group	All vessels participating in the ETBF

Other eligible fishers	All fishers included in UoA
UoA 3	Description
Species	Bigeye tuna (*Thunnus obesus*)
Stock	Western and Central Pacific bigeye
Geographical area	FAO Area 71, 81, and 57.6 East coast of Australia, inside the Australian Fishery Zone (AFZ) and adjacent high seas areas.
Harvest method / gear	Pelagic mid-set longline
Client group	All vessels participating in the ETBF
Other eligible fishers	All fishers included in UoA
UoA 4	Description
Species	Broadbill swordfish (*Xiphias gladius*)
Stock	Southwest Pacific swordfish
Geographical area	FAO Area 71, 81, and 57.6 East coast of Australia, inside the Australian Fishery Zone (AFZ) and adjacent high seas areas
Harvest method / gear	Pelagic mid-set longline
Client group	All vessels participating in the ETBF
Other eligible fishers	All fishers included in UoA

5.1.2 Unit(s) of Certification

Table 3 – Unit(s) of Certification (UoC)	
UoC 1	Description
Species	Yellowfin tuna (*Thunnus albacares*)
Stock	South Pacific albacore
Geographical area	FAO Area 71, 81, and 57.6 East coast of Australia, inside the Australian Fishery Zone (AFZ) and adjacent high seas areas
Harvest method / gear	Pelagic mid-set longline
Client group	Members of Tuna Australia (see vessel list in Appendix 9)
Other eligible fishers	Other vessels participating in the ETBF
UoC 2	Description

Species	Albacore tuna (*Thunnus alalunga*)
Stock	Western and Central Pacific yellowfin
Geographical area	FAO Area 71, 81, and 57.6 East coast of Australia, inside the Australian Fishery Zone (AFZ) and adjacent high seas areas
Harvest method / gear	Pelagic mid-set longline
Client group	Members of Tuna Australia (see vessel list in Appendix 9)
Other eligible fishers	Other vessels participating in the ETBF
UoC 3	Description
Species	Bigeye tuna (*Thunnus obesus*)
Stock	Western and Central Pacific bigeye
Geographical area	FAO Area 71, 81, and 57.6 East coast of Australia, inside the Australian Fishery Zone (AFZ) and adjacent high seas areas
Harvest method / gear	Pelagic mid-set longline
Client group	Members of Tuna Australia (see vessel list in Appendix 9)
Other eligible fishers	Other vessels participating in the ETBF
UoC 4	Description
Species	Broadbill swordfish (*Xiphias gladius*)
Stock	Southwest Pacific swordfish
Geographical area	FAO Area 71, 81, and 57.6. East coast of Australia, inside the Australian Fishery Zone (AFZ) and adjacent high seas areas.
Harvest method / gear	Pelagic mid-set longline
Client group	Members of Tuna Australia (see vessel list in Appendix 9)
Other eligible fishers	Other vessels participating in the ETBF

5.2 Assessment results overview

5.2.1 Determination, formal conclusion and agreement

To be drafted at Final Draft Report

To be completed at Public Certification Report

The report shall include a formal statement as to the certification determination recommendation reached by the assessment team on whether the fishery should be certified.

The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

Reference(s): FCP v2.1 Section 7.21

5.2.2 Principle level scores

Table 4 - Principle level scores

Principle	UoA 1 Albacore	UoA 2 Yellowfin	UoA 3 Bigeye	UoA 4 Swordfish
Principle 1 – Target species	82.5	80.8	86.7	80.0
Principle 2 – Ecosystem impacts	86.3	86.3	86.3	86.3
Principle 3 – Management system	96.5	96.5	96.5	96.5

5.2.3 Summary of conditions

Table 5 – Summary of conditions

Condition number	Condition	Performance Indicator (PI)	Related to previous condition?
1.	Yellowfin tuna: By the second surveillance audit, demonstrate that the harvest strategy for yellowfin tuna is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80 Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021.	1.2.1	**Yes**
2.	Yellowfin tuna: By the second surveillance audit, demonstrate that well defined HCRs are in place for yellowfin tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. (Scoring Issue - SI a)) By the second surveillance audit, provide evidence that the selection of the harvest control rules for yellowfin tuna are robust to the main uncertainties. (SI b)) By the second surveillance audit, provide evidence that indicates that the tools in use for yellowfin tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules. (SI c)	1.2.2	**Yes**

	Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021.		
3.	Albacore tuna: By the second surveillance audit, demonstrate that the harvest strategy for albacore tuna is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021.	1.2.1	**Yes**
4.	Albacore tuna: By the second surveillance audit, demonstrate that well defined HCRs are in place for albacore tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. (SI a)) By the second surveillance audit, provide evidence that the selection of the harvest control rules for albacore tuna are robust to the main uncertainties. (SI b) By the second surveillance audit, provide evidence that indicates that the tools in use for albacore tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules. (SI c) Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021.	1.2.2	**Yes**
5.	Bigeye tuna: By the second surveillance audit, demonstrate that the harvest strategy for bigeye tuna is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021.	1.2.1	**No**
6.	Bigeye tuna: SI a) By the second surveillance audit, demonstrate that well defined HCRs are in place for bigeye tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. (SI a)	1.2.2	**No**

	By the second surveillance audit, provide evidence that the selection of the harvest control rules for bigeye tuna are robust to the main uncertainties. (SI b) By the second surveillance audit, provide evidence that indicates that the tools in use for bigeye tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules. (SI c) Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021.		
7.	Swordfish: By the second surveillance audit, demonstrate that the harvest strategy for swordfish is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	1.2.1	**No**
8.	Swordfish: SI a) By the second surveillance audit, demonstrate that well defined HCRs are in place for swordfish that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. SI b) By the second surveillance audit, provide evidence that the selection of the harvest control rules for swordfish are robust to the main uncertainties. SI c) By the second surveillance audit, provide evidence that indicates that the tools in use for swordfish are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	1.2.2	**Yes**
9	For main primary species used as bait in the UoA, some evidence shall be available at the fourth surveillance audit, that there is a partial strategy being successfully implemented to maintain or to not hinder stock rebuilding at/to levels which are highly likely to be above the PRI.	2.1.2	**No**

5.2.4 Recommendations

Recommendation 1:
The blue shark is a main secondary species with poorly known stock status. However, inherent vulnerability of shark species is high, and this species was ranked as "medium" in the most recent ecological risk assessment. It is recommended that any findings of the 2021 stock assessment planned by WCPFC are considered, together with catch information from the UoA. Further, close monitoring of the risk presented by the fishery to this species is recommended (e.g. with reference to catch data and fishing mortality).

6 Traceability and eligibility

6.1 Eligibility date

The fishery was previously certified as Walker Seafoods albacore and yellowfin tuna and swordfish longline fishery. The eligibility date is therefore the 26 August 2020, which is the day after the MSC Certificate for this fishery is due to expire. Following the Covid-19 outbreak, the MSC issued a derogation that extended all fishery certificates for 6 months. The new eligibility date is now 26 February 2021. Despite the extension, the fishery has opted for the original eligibility date of the 26 August 2020.

6.2 Traceability within the fishery

Table 6 – Traceability within the fishery

Factor	Description
Will the fishery use gear that are not part of the Unit of Certification (UoC)? If Yes, please describe: - If this may occur on the same trip, on the same vessels, or during the same season; - How any risks are mitigated.	No other fishing gear is used. There are 84 minor line SFR holders permitted to use pole and line, troll and handline but almost all of them are inactive SFR holders. In 2018 none of these were active and only 1 or 2 vessels were active in previous years. No other gear is used during the same trip and therefore the risk of mixing is very small to negligible.
Will vessels in the UoC also fish outside the UoC geographic area? If Yes, please describe: - If this may occur on the same trip; - How any risks are mitigated.	No. Vessels in the UoC only fish in the geographical area described. They are also subject to e-monitoring and therefore the risk of a vessel fishing outside of the UoC is very low.
Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities. - Transport - Storage - Processing - Landing - Auction	All members of the client, Tuna Australia, are included in the UoC and would therefore not handle any non-certified products. There are other fishers/ vessels in the ETBF not included in the UoC and their product is not certified. The products can be distinguished by a company's unique product codes and therefore mixing risk of substitution of certified fish with non-certified fish is low. All Tuna Australia members operate advanced logistics and stock control systems and product can

If Yes, please describe how any risks are mitigated.	be distinguished by the company's product/item codes.
Does transhipment occur within the fishery? If Yes, please describe: - If transhipment takes place at-sea, in port, or both; - If the transhipment vessel may handle product from outside the UoC; - How any risks are mitigated.	No, there is no transhipment undertaken by the client members. In 2018 there were four transhipment events which occurred due to vessel breakdown which were reported.
Are there any other risks of mixing or substitution between certified and non-certified fish? If Yes, please describe how any risks are mitigated.	No additional risks have been identified at this stage.

6.3 Eligibility to enter further chains of custody

Tracking and traceability information for this fishery is considered sufficient for product to be eligible to enter further chains of custody.

All products of the UoCs landed under licences held by members of Tuna Australia are eligible to use the fishery certificate (see Appendix 9).

The eligible points of landing are: Cairns, Mooloolaba, Gold Coast in Queensland, and Yamba, Coffs Harbour, Port Stephens, Nelson Bay, Sydney, Ulladulla, Narooma, Bermagui and Eden, in New South Wales, Australia.

The point of change of legal ownership of product from the fishery from which Chain of Custody certification is required are the points of landing listed above. All merchants and processors that receive product from the certified fishery prior to sale or purchase product from this fishery will require their own Chain of Custody certification.

7 Scoring

7.1 Summary of Performance Indicator level scores

Principle	Component	Performance Indicator (PI)		UoA 1 Yellowfin	UoA 2 Albacore	UoA 3 Bigeye	UoA 4 Swordfish
One	Outcome	1.1.1	Stock status	**90**	**100**	**100**	**90**
		1.1.2	Stock rebuilding	NA	NA	NA	NA
	Management	1.2.1	Harvest strategy	**70**	**70**	**70**	**70**
		1.2.2	Harvest control rules & tools	**60**	**60**	**60**	**60**
		1.2.3	Information & monitoring	**80**	**80**	**90**	**80**
		1.2.4	Assessment of stock status	**95**	**85**	**100**	**90**
Two	Primary species	2.1.1	Outcome	**90**			
		2.1.2	Management strategy	**75**			

		2.1.3	Information/Monitoring	**90**
	Secondary species	2.2.1	Outcome	**90**
		2.2.2	Management strategy	**90**
		2.2.3	Information/Monitoring	**85**
	ETP species	2.3.1	Outcome	**80**
		2.3.2	Management strategy	**85**
		2.3.3	Information strategy	**80**
	Habitats	2.4.1	Outcome	**100**
		2.4.2	Management strategy	**85**
		2.4.3	Information	**80**
	Ecosystem	2.5.1	Outcome	**90**
		2.5.2	Management	**85**
		2.5.3	Information	**85**
Three	Governance and policy	3.1.1	Legal &/or customary framework	**100**
		3.1.2	Consultation, roles & responsibilities	**100**
		3.1.3	Long term objectives	**90**
	Fishery specific management system	3.2.1	Fishery specific objectives	**90**
		3.2.2	Decision making processes	**95**
		3.2.3	Compliance & enforcement	**100**
		3.2.4	Monitoring & management performance evaluation	**100**

7.2 Principle 1

7.2.1 Principle 1 background

Albacore tuna

Behaviour

Albacore does not appear to follow the scattering layer or vertically migrate. Adult albacore prefer water temperature between 15°C and 21–25°C, with an optimum of 18–19°C, resulting in the vertical distribution becoming shallower at higher latitudes (Lu et al. 1998, Chen et al. 2005; cited by Molony 2008). However, spawning adults prefer higher water temperatures (24.9°C) than non-spawning adults (19.1°C) (Chen et al. 2005). This may result in spawning albacore having a shallower distribution. Adult albacore is often associated with oceanographic features, particularly temperature and oxygen fronts (Collette and Nauen 1983) and eddies produced by current shear. For example, between the south equatorial counter-current and the south-equatorial current (Domokos et al. 2007).

Albacore distribution is linked with the distribution of prey species, bathymetry and temperature fronts (Langley 2004). The North Pacific Transition Zone (NPTZ), the Kuroshio Front east of Japan, and the Sub–Tropical Convergence Zone (STCZ) of the temperate south Pacific are examples of frontal zones where albacore are abundant. Albacore tends to occur within frontal zones rather than in the colder (<15°C) poleward water (Sund et al. 1980 – cited by Molony 2008).

Albacore appears to gradually disperse north from the southern latitudes as they grow, but adult longline catch data indicate that they appear to migrate seasonally between tropical and subtropical waters (Langley, 2004; Nikolic et al., 2017). There were limited tagging data available for the assessment.

Albacore are opportunistic carnivores consuming a range of micronekton including fish (mackerels and small tuna), crustaceans and cephalopods (Molony 2008). Their trophic level has been estimated at 4.3 +/- 0.2 SE. They are not a low trophic level species.

Growth and Natural Mortality

Albacore can reach 45-50 cm (FL) in their first year (Leroy and Lehodey 2004; Williams et al. 2012) but subsequent growth is slower, at approximately 12 cm per year from years 2 to 4, and declining thereafter (Williams et al. 2012) (Figure 1). Maximum recorded length is about 120 cm (FL) but sex-combined von Bertalanffy growth models for both the South and North Pacific albacore predict L1 around 105 cm (Williams et al. 2012; Xu et al. 2014). Recent analyses of age-at-length from otolith data have identified important patterns in South Pacific albacore growth (Williams et al. 2012; Farley et al. 2013). Males grow to larger sizes than females, and their lengths-at-age start to diverge above about 85 cm when they reach maturity. Lengths-at-age of both sexes also appear to vary with longitude, with both growth rates and maximum sizes increasing toward the east and reaching a maximum at about 160 W. In the New Zealand troll fishery, there are clear 10 cm modes in the length frequency data for juveniles between 50 and 80 cm. These modes should be annual based on maturity ogives for this species combined with indicated annual spawning, peaking in January (Farley et al. 2014).

The instantaneous natural mortality rate is believed to be between 0.2 and 0.5 per year, with significant numbers of fish reaching 10 years or more. The default *M* of 0.4 used in assessments was updated in 2015 to 0.3 to match that used in other stocks, including the North Pacific. A recent meta-analysis of mortality for the North Pacific stock indicated *M* should be closer to 0.4, higher for females, and age-specific (Kinney and Teo 2016). These findings may also be relevant to the South Pacific stock.

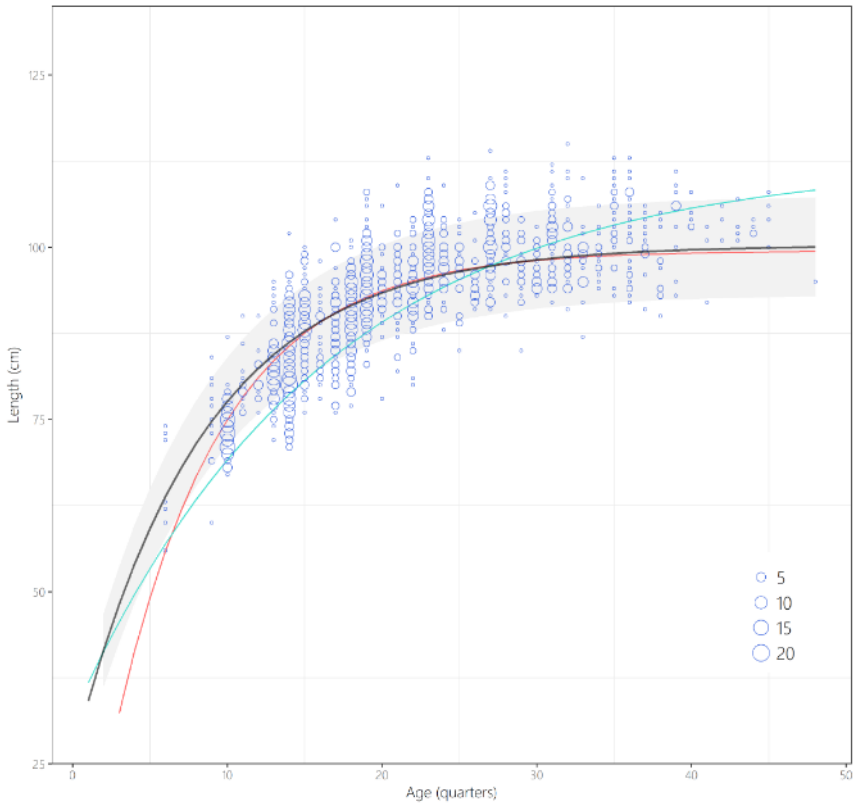

Figure 1. Albacore: Estimated growth for the diagnostic case model vs. age-at-length samples included in the model. The blue line represents the estimated mean fork length (cm) at-age and the blue region represents the length-at-age within one standard deviation of the mean, for the diagnostic case model. The green line is the growth for the Chen-Wells growth scenario and the red line represents the fitted growth from the 2015 stock assessment (from Tremblay-Boyer et al. 2018).

Reproduction and Recruitment

For the South Pacific stock, reproductively active albacore have been found in most waters of the South Pacific Ocean between 10°S and 30°S and 165°E and 115°W (ECOTAP 1999). Histological examination of albacore sampled from Tonga and New Caledonia suggest that albacore are annual spawners with most spawning limited to the austral summer months from November to February (Ramon and Bailey 1996). Albacore larvae have been reported to occur south of 10°S for all months between October and June, indicating that spawning may be protracted.

Gonadosomatic data indicate that female albacore in Tonga and New Caledonia reach maturity at about 80 cm FL (Griggs 2004), corresponding to an age of 4–5 years (Leroy and Lehodey 2004). Similar to other scombrids, albacore may be serial spawners that spawn during extended periods. Estimated fecundity for North Pacific albacore ranges from 0.8–2.6 million eggs, assuming release of all advanced eggs occurs in a single spawning, although at least two batches of eggs were identified by Collette and Nauen (1983). However, there is a weak relationship between fish size and ovary size and therefore, the number of eggs produced by a female (Collette and Nauen 1983). The maturity relationships used in the recent assessment are shown in Figure 2.

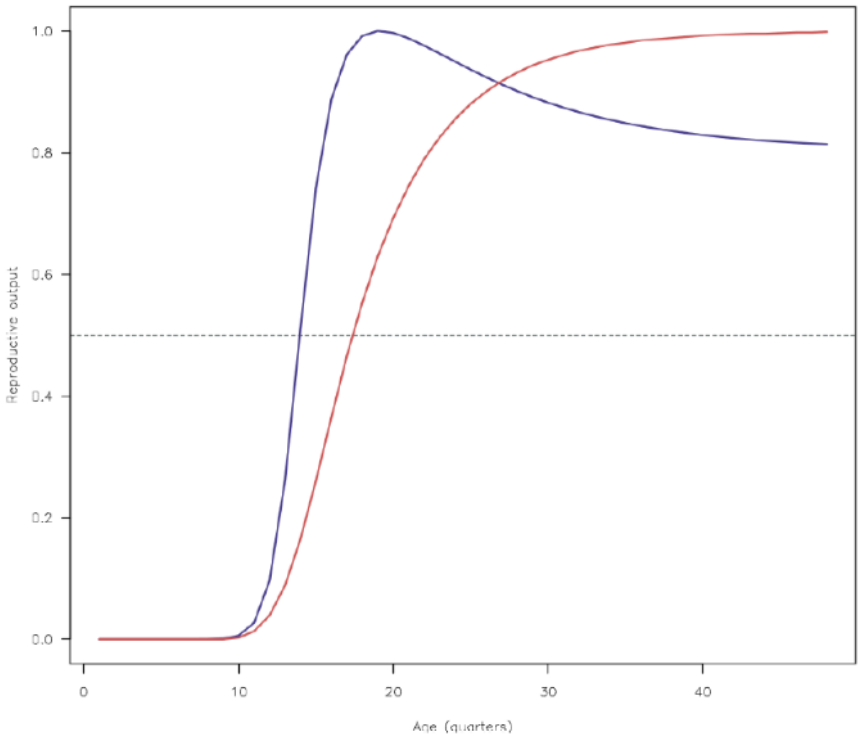

Figure 2. Albacore: Maturity-at-age as used in the diagnostic case model (blue line) and in the 2015 assessment (red line) (from Tremblay-Boyer et al. 2018).

Distribution and Stock Structure

Albacore tuna comprises a discrete stock in the South Pacific (Murray 1994). The equator is accepted as the boundary between stocks found in the North and South Pacific and a wide range of evidence supports this hypothesis.

Albacore – Stock assessment

The stock assessment for albacore was updated in 2018 (Tremblay-Boyer et al. 2018). This was an update of the previous assessment (Harley et al. 2015) but also addressed relevant recommendations of that assessment report, and the recommendations of the 2018 pre-assessment workshop (PAW; Pilling and Brouwer, 2018), to explore uncertainties in the assessment model, particularly in response to the inclusion of additional years of data and to improve diagnostic weaknesses in previous assessments.

In addition to the diagnostic case model, the assessment reported the results of one-off sensitivity models to explore the relative impacts of key data and model assumptions for the diagnostic case model on the stock assessment results and conclusions. The assessment also included a structural uncertainty analysis (model grid) for consideration in developing management advice, where all possible combinations of the most important axes of uncertainty from the one-off models were included. It was recommended that management advice be formulated from the results of the structural uncertainty grid (Table 5. Albacore: Summary of reference points over all of the 72 individual models in the structural uncertainty grid (from Tremblay-Boyer et al. 2018).).

Across the range of models run in this assessment, the most important factors when evaluating stock status were the assumed level of natural mortality (*M*), and growth. For natural mortality, age-invariant *M* values of 0.3 yr1 (consistent with the 2015 assessment) and 0.4 yr1 were assumed, with the latter resulting in more optimistic assessment outcomes. Age-dependent *M* settings were also evaluated as one-off sensitivities. Natural mortality remains a key uncertainty in this assessment, and it is appropriate that such uncertainty continue to be reflected in the overall stock assessment results. For growth, the conditional age-at-length data from recent work was incorporated into the diagnostic case model, while an alternative scenario fixed at the parameter values of the sex-combined `Chen-

Wells' growth model used within the 2017 North Pacific albacore reference case model run was also evaluated. Use of the latter resulted in more pessimistic assessment outcomes. There remains an unresolved inconsistency in the growth rates indicated by the VB curve fitted to the age-at-length data (approximately 20 cm per year for albacore 20-70 cm in length) and presumed annual modes with 10 cm spacing that consistently appear in the troll size composition data, and historically in the driftnet size composition data. Additional analysis of otoliths taken from 50-70 cm albacore in the troll fishery is required to identify the reason for this inconsistency. This is work that needs to be undertaken with high priority.

The general conclusions of this assessment were as follows:

- While biomass was estimated to have declined initially, estimates of spawning potential, and biomass vulnerable to the various longline fisheries have been stable or possibly increasing slightly over the past 20 years. This has been influenced mainly by the estimated recruitment, which has generally been somewhat higher since 2000 than in the two decades previous (Figure 3).
- Most models estimate an increase in spawning and longline vulnerable biomass since about 2011, driven by some high estimated recruitments, particularly around 2009.
- A steady increase in fishing mortality of adult age-classes was estimated to have occurred over most of the assessment period, accelerating since the 1990s but declining following the decline in longline catch seen since 2010. Juvenile fishing mortality increased until around 1990 and has remained stable at a low level since that time.
- Key stock assessment results across all models in the structural uncertainty grid showed a wide range of estimates.
- All models indicate that South Pacific albacore was above the limit reference point (of $0.2SB_{F=0}$), with overall median depletion for 2016 ($SB_{latest}/SB_{F=0}$) estimated at 0.52 (80 percentile range 0.37-0.69) (Figure 4).
- Recent average fishing mortality was estimated to be well below F_{MSY} (median F_{recent}/F_{MSY} = 0.2, 80 percentile range 0.08-0.41).

The 2018 assessment used a revised regional structure. Region 2 is estimated to contain the majority of the spawning potential and total biomass but most of the recruitment is estimated to originate in Regions 3 and 5. Recruitment from these southern regions was noted as being consistent with where small albacore first appear in the troll fishery, and also where smaller albacore occur in longline fisheries.

Other results of the structural uncertainty analysis were as follows:

- The uncertainty identified was higher than for previous assessments for this albacore stock,
- The most influential axis was that of natural mortality;
- The next most influential axis was growth which further divided the runs into two distinct categories in terms of depletion trends, with virtually no overlap from 1980 onwards.
- CPUE was the next most influential axis. Overall the geostatistical CPUE resulted in a slightly higher median depletion but the traditional CPUE runs were more variable in terms of the initial depletion.
- Size weighting was not the main driver of grid trends.
- The steepness axis had minimal influence on the grid for runs predicting lower, more optimistic depletion estimates, but runs approaching 40% depletion had a clear pattern with 0.65 and 0.95 steepness resulting in more pessimistic and more optimistic terminal depletion, respectively.

The WCPFC Scientific Committee accepted this assessment and noted that the assessment results show that while the stock depletion ($SB/SB_{F=0}$) has exhibited a long-term decline the stock was not in an overfished state and overfishing was not taking place (WCPFC-SC 2018) (Figure 5, Figure 6).

In 2018 the WCPFC Scientific Committee also recalled its previous advice from SC11, SC12, and SC13 that longline fishing mortality and longline catch be reduced to avoid a decline in the vulnerable biomass so that economically viable catch rates can be maintained, especially for the longline catch of adult albacore. SC14 recommended that this advice be taken into consideration when the TRP for South Pacific albacore was discussed at the following WCPFC Commission meeting.

Previously, WCPFC-SC (2017) had noted the results of status quo projections, assuming current southern longline and troll fishery effort would continue into the future at levels equal to those seen in 2015 (Figure 7). These indicated that, if 2015 fishing effort levels continue into the future, the stock was predicted to continue to decline on average, falling to $SB_{current}/SB_{F=0}$ = 0.35 in 2033 with a 7% predicted probability of being below the LRP. As SB_{MSY} has been estimated to be less than 0.1 $SB_{F=0}$ these projections show there to be no risk of the stock being reduced to below B_{MSY} within the next 5 years.

Table 5. Albacore: Summary of reference points over all of the 72 individual models in the structural uncertainty grid (from Tremblay-Boyer et al. 2018).

	Mean	Median	Min	10%	90%	Max
C_{latest}	61719	61635	60669	60833	62704	63180
MSY	100074	98080	65040	70856	130220	162000
$YF_{current}$	71579	71780	56680	62480	80432	89000
fmult	6.2	4.96	1.89	2.44	12.05	17.18
F_{MSY}	0.07	0.07	0.05	0.05	0.09	0.1
$F_{recent}/F_{\text{MSY}}$	0.23	0.2	0.06	0.08	0.41	0.53
SB_{MSY}	71407	68650	26760	39872	100773	134000
SB_0	443794	439800	308800	353870	510530	696200
SB_{MSY}/SB_0	0.16	0.17	0.07	0.1	0.21	0.23
$SB_{F=0}$	469004	462633	380092	407792	534040	620000
$SB_{\text{MSY}}/SB_{F=0}$	0.15	0.15	0.06	0.09	0.2	0.22
SB_{latest}/SB_0	0.55	0.56	0.33	0.42	0.69	0.74
$SB_{latest}/SB_{F=0}$	0.53	0.52	0.3	0.37	0.69	0.77
$SB_{latest}/SB_{\text{MSY}}$	4	3.42	1.45	1.96	7.07	10.74
$SB_{recent}/SB_{F=0}$	0.51	0.52	0.32	0.37	0.63	0.72
$SB_{recent}/SB_{\text{MSY}}$	3.88	3.3	1.58	1.96	6.56	9.67

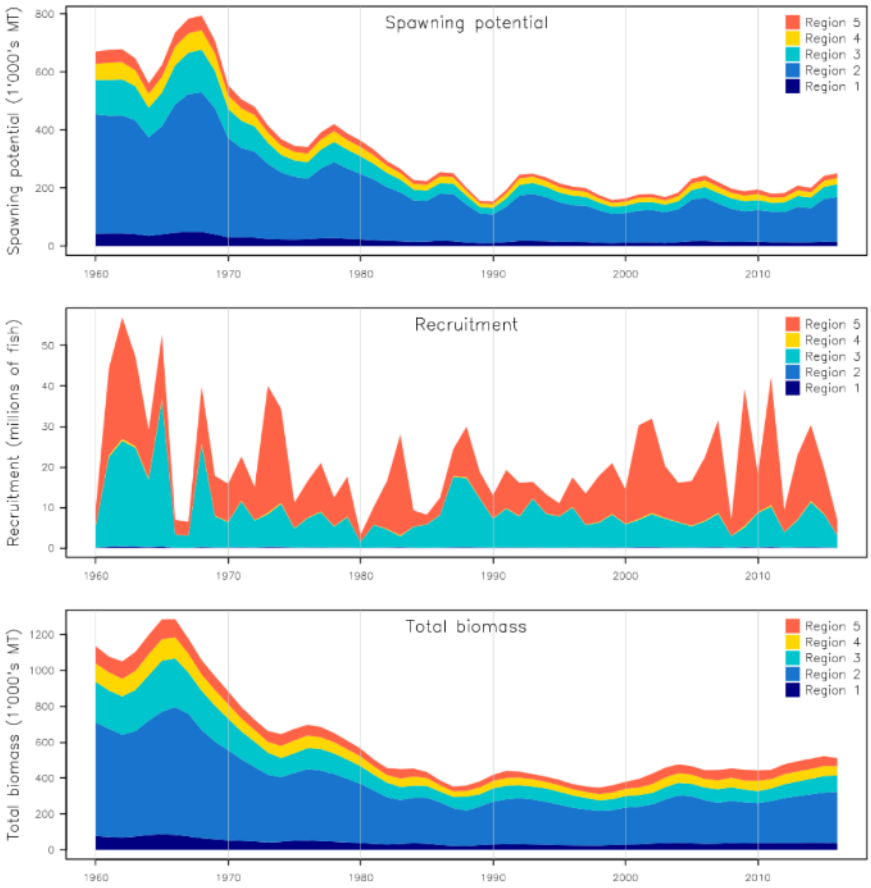

Figure 3. Albacore: Estimated annual average recruitment, spawning potential and total biomass by model region for the diagnostic case model, showing the relative sizes among regions (from Tremblay-Boyer et al. 2018).

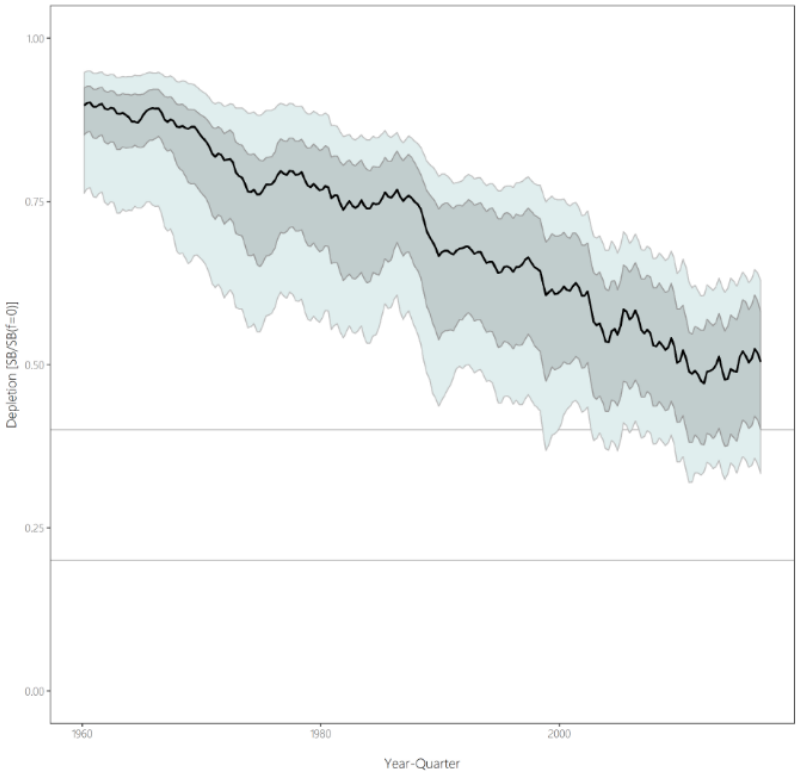

Figure 4. Albacore: Distribution of time series depletion estimates across the structural uncertainty grid. The black line represents the grid median trajectory, the dark grey region represents the 50%ile range, light grey the 90%ile range (from Tremblay-Boyer et al. 2018).

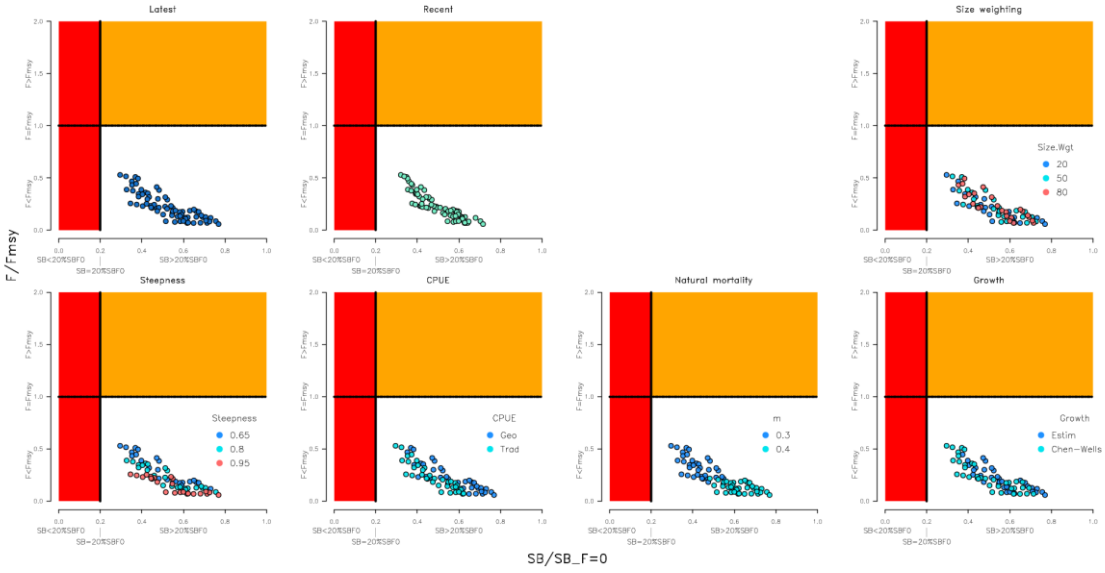

Figure 5. Albacore: Majuro plots summarising the results for each of the models in the structural uncertainty grid. The plots represent estimates of stock status in terms of spawning potential depletion and fishing mortality. The red zone represents spawning potential levels lower than the agreed limit reference point which is marked with the solid black line. The orange region is for fishing mortality greater than F_{MSY} (F_{MSY} is marked with the black dashed line). The points represent $SB_{latest}/SB_{F=0}$ for each model run except in panel (b) where $SB_{recent}/SB_{F=0}$ is displayed. The remaining panels show the estimates for the different levels for the five axes of the grid (from Tremblay-Boyer et al. 2018).

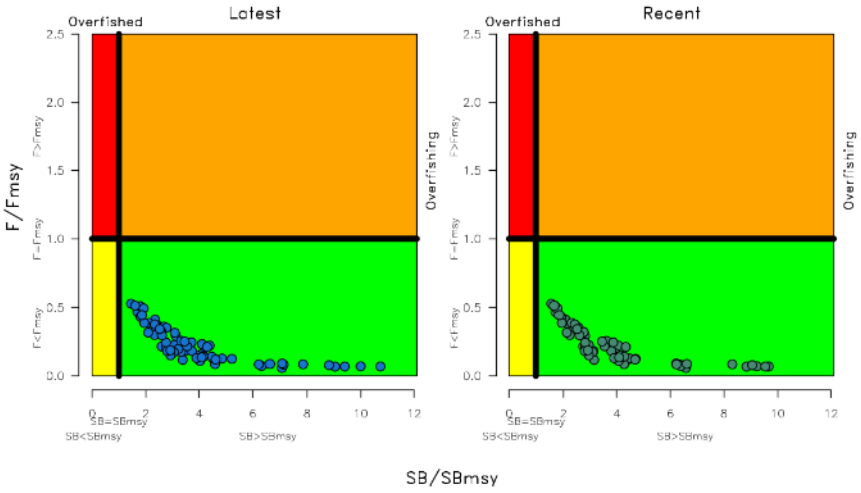

Figure 6. Albacore: Kobe plots summarising the results for each of the models in the structural uncertainty grid under the $SB_{latest}/SB_{F=0}$ and the $SB_{recent}/SB_{F=0}$ reference points (from Tremblay-Boyer et al. 2018).

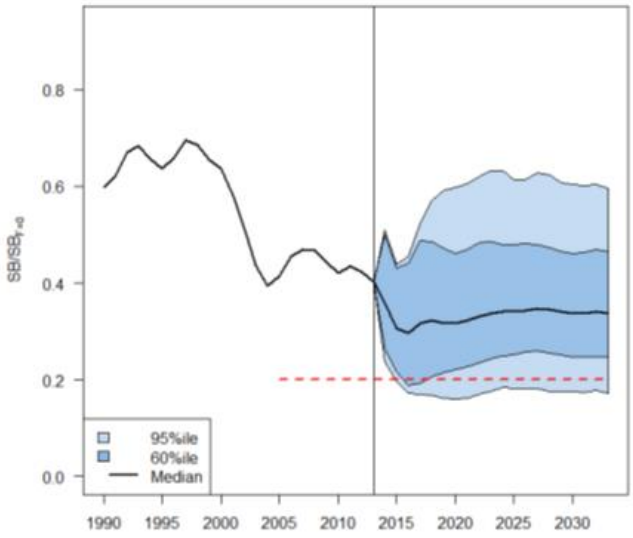

Figure 7. Albacore: Stochastic projections of adult stock status under 2014 longline and troll effort levels. The limit reference point (20% $SB_{F=0}$) is indicated by the horizontal dashed red line. Note: from 1960, up to 2013 inclusive the line represents the median across the 9-assessment model runs (structural uncertainty only); uncertainty after 2013 represents both structural uncertainty and stochastic recruitment (1800 simulation runs) (from WCPFC-SC 2017).

Harvest Strategy

The process that has been followed by WCPFC as it develops harvest strategies for tropical tunas has been described above for yellowfin tuna. In addition, for South Pacific albacore, there has been a separate virtual inter-sessional working group that has been formed to help develop a 'roadmap'. The activity report provided to the 2018 Commission meeting (WCPFC-SPA 2018) records the terms of reference for this working group as being to consider management issues including:

a. Elements are necessary for the implementation of the Harvest Strategy
b. An allocation process
c. Monitoring and reporting priorities and addressing of gaps for all fisheries taking south Pacific albacore in the WCPO.

This report contained a draft work plan for discussion at WCPFC15, including an allocation schedule, but there had been discussion to the effect that "the goal of having limits and allocations for south

Pacific albacore will be adopted in 2021, to align with the adoption of harvest control rules, as currently scheduled in the harvest strategy work plan, is ambitious and warrants further discussion with other CCMs."

For South Pacific albacore, the WCPFC has adopted 20% SBF=0 as the limit reference point (LRP), where SBF=0 is calculated as the average over the period 2006-2015. Generally, the WCPFC has set reference points for tuna stocks relative to MSY related reference points which is consistent with Article 5(b) of its convention text: "ensure that such measures are based on the best scientific evidence available and are designed to maintain or restore stocks at levels capable of producing maximum sustainable yield".

However, stock assessments estimate that SBMSY is lower than the agreed LRP, being only 16% of the SBF=0, in the 2018 assessment (Tremblay-Boyer et al. 2018). Therefore, other options for a TRP have been considered. In the meantime, stock assessments have continued to report stock status relative to MSY based reference points including the rations of F_{latest} and F_{recent} to FMSY and of SB_{latest} and SB_{recent} to SB_{MSY}.

In 2018, and since the most recent assessment, the WCPFC adopted an interim TRP for south Pacific albacore of 0.56 SBF=0, with the intention of achieving an increase in the profitability of the fishery, as described in the following extract from WCPFC15 Summary report (WCPFC 2018b).

> 207. The Commission shall amend or develop appropriate conservation and management measures to implement a harvest control rule, developed in accordance with CMM 2014-06, with the objective of maintaining the south Pacific albacore spawning stock biomass at the target level on average and according to the timeframes specified in paragraph 209.
>
> 208. In order to manage the required reduction in catches, the timeline for achieving the interim target reference point shall be no later than 20 years. The Science Service Provider is tasked with identifying a range of alternative catch pathways and timeframes that achieve this, for consideration in 2019.
>
> 209. In undertaking the assessment identified in paragraph 209 information from all fisheries will be included while noting that any management measures must take account of the impact of different gear types.
>
> 210. The Scientific Committee shall refer to the target reference point in its assessment of the status of the WCPO South Pacific albacore tuna stock and in reporting to the Commission on management advice and implications for this stock.
>
> 211. Considering that the distribution of the South Pacific albacore stock goes beyond the WCPFC Convention area and the management of this stock is the responsibility of both WCPFC and IATTC, WCPFC15 requested the Scientific Services Provider to coordinate with the IATTC scientific staff with the view to consider including the entire South Pacific in future assessments.

WCPFC15 agreed on an interim target reference point (TRP) for south Pacific albacore at 56 percent of spawning stock biomass in the absence of fishing (0.56 SBF=0) with the objective of achieving an 8 percent increase in catch per unit of effort (CPUE) for the southern longline fishery as compared to 2013 levels. If a future stock assessment indicates that this interim TRP will not result in the desired longline CPUE, then the interim TRP will be revised in order to meet this objective. The TRP shall be reviewed every 3 years, consistent with the SP albacore assessment schedule.

This newly agreed TRP is an economic one so, although the stock is estimated to be below the TRP and some measure of rebuilding is desirable, it is not considered to be overfished or to be requiring rebuilding for conservation reasons.

FFA member countries originally proposed a target that would achieve a 17% increase in CPUE above 2013 levels for the fishery (FFA 2018), on the basis that such an increase would be necessary to give all vessels in the southern longline fishery, including SIDS domestic longline fisheries, a reasonable chance of remaining economically viable. Analyses by the Offshore Fisheries Program (OFP) of the Secretariat to the Pacific Community (SPC) estimated that such an increase in CPUE would require SB/SBF=0 to be set at 0.60 (Table 6). These analyses also estimate that the agreed interim TRP of 0.56 SB/SBF=0 would have an approximate risk of breaching the LRP of less than 3% but noted that "None of the uncertainty due to e.g. future recruitment variability is captured, and we, therefore, expect the risk to be underestimated."

Harvest control rules for south Pacific albacore have yet to be adopted. Paragraphs 209 and 210 from the WCPFC15 summary report note that options for achieving the TRP within 20 years are to be considered in 2019.

The work plan that WCPFC adopted in 2015 and revised in 2016 and 2017 for South Pacific albacore tuna (Table 7) indicates that there are still important decisions to be made concerning harvest control rules.

Table 6. Albacore: Average conditions for the southern longline fishery and South Pacific albacore stock, including the approximate risk of falling below the adopted LRP1, under different candidate TRP levels. Greyed cells indicate the projection settings equivalent to the candidate aim of management. All values represent medians across the 72 assessment models (from SPC-OFP 2018).

Management aim	VB_{equil}/VB_{2013}	Scalar on 2013-15 avg catches	$SB/SB_{F=0}$	F/F_{MSY}	Approx risk SB < LRP
Achieve SB_{MSY}	0.27	1.32	0.15	-	54%
Maintain status quo (catch at 2013-15 avg)	0.70	1.00	0.42	0.26	24%
Reduce catch by 10%	0.84	0.90	0.47	0.20	14%
Maintain the stock at recent levels	0.99	0.81	0.52	0.17	3%
Keep CPUE at 2013 levels on average	1.00	0.80	0.53	0.17	3%
Increase CPUE by 10% from 2013 levels	1.10	0.73	0.57	0.15	0%
Increase CPUE by 17% from 2013 levels	1.17	0.67	0.60	0.14	0%
Increase CPUE by 25% from 2013 levels	1.25	0.62	0.63	0.12	0%

Table 7. Work plan from WCPFC14 (2017) for albacore tuna for the adoption of harvest strategies under CMM 2014-06.

Year	Activity
• 2017	• **Performance indicators and monitoring strategy (d)** ▪ SC provided advice on a range of performance indicators for the Southern Longline Fishery to evaluate the performance of harvest control rules. ▪ Commission noted performance indicators for the Southern Longline Fishery to evaluate harvest control rules.
•	• **2017 Progress summary:** ▪ Noted candidate performance indicators for the Southern Longline Fishery and the Tropical Longline fishery to evaluate harvest control rules. ▪ Agreed on actions to prioritize the development and adoption of a Target Reference Point for South Pacific albacore at WCPFC15.
• 2018	**Agree on Target Reference Point (b).**

	▪ Commission agrees on a TRP for South Pacific albacore. **Develop harvest control rules (e)** and **Management strategy evaluation (f)** ▪ SC provides advice on the performance of candidate harvest control rules. (ongoing). ▪ TCC consider the implications of candidate harvest control rules. (ongoing). ▪ Commission consider advice on progress towards **harvest control rules**. (ongoing). [SC updated advice on SP albacore status.]
• 2019	**Develop harvest control rules (e)** and **Management strategy evaluation (f)** ▪ SC provides advice on the performance of candidate harvest control rules. (ongoing). ▪ TCC consider the implications of candidate harvest control rules. (ongoing). ▪ Commission consider advice on progress towards **harvest control rules**. (ongoing).
• 2020	**Develop harvest control rules (e)** and **Management strategy evaluation (f)** ▪ SC provide advice on the performance of candidate harvest control rules. (ongoing). ▪ TCC consider the implications of candidate harvest control rules. (ongoing). ▪ Commission consider advice on progress towards **harvest control rules**. (ongoing).
• 2021	**Develop harvest control rules (e)** and **Management strategy evaluation (f)** ▪ SC provide advice on the performance of candidate harvest control rules. ▪ TCC consider the implications of candidate harvest control rules. ▪ Commission consider advice on progress towards **harvest control rules**. **Adopt a Harvest Control Rule.**

Yellowfin tuna

Behaviour

Yellowfin tuna is a large, schooling tuna, common in surface waters of tropical and sub-equatorial oceans (Molony 2008). Tagging with acoustic transmitters or ultrasonic tags has shown yellowfin spend a majority of their time in the upper mixed layer of the ocean (less than 100 m) and typically in temperatures above 17–18°C (Molony 2008).

Yellowfin tuna feed on other fish, crustaceans and squid. Their trophic level has been estimated at 4.4 +/- 0.4 SE. They are not a low trophic level species.

Growth and Natural Mortality

Growth in length for yellowfin tuna is estimated to continue throughout their life (Figure 8). The estimated mean length of the final age-class is 153.4 cm, but the maximum fork length is over 200 cm.

Natural mortality is estimated to vary with age and sex. The generally increasing proportion of males in the catch with the increasing size is assumed to be due to an increase in the natural mortality of females, associated with sexual maturity and the onset of reproduction. The assessment model used fixed externally estimated values for natural mortality-at-age but also examined the sensitivity to estimating this during the model fitting process.

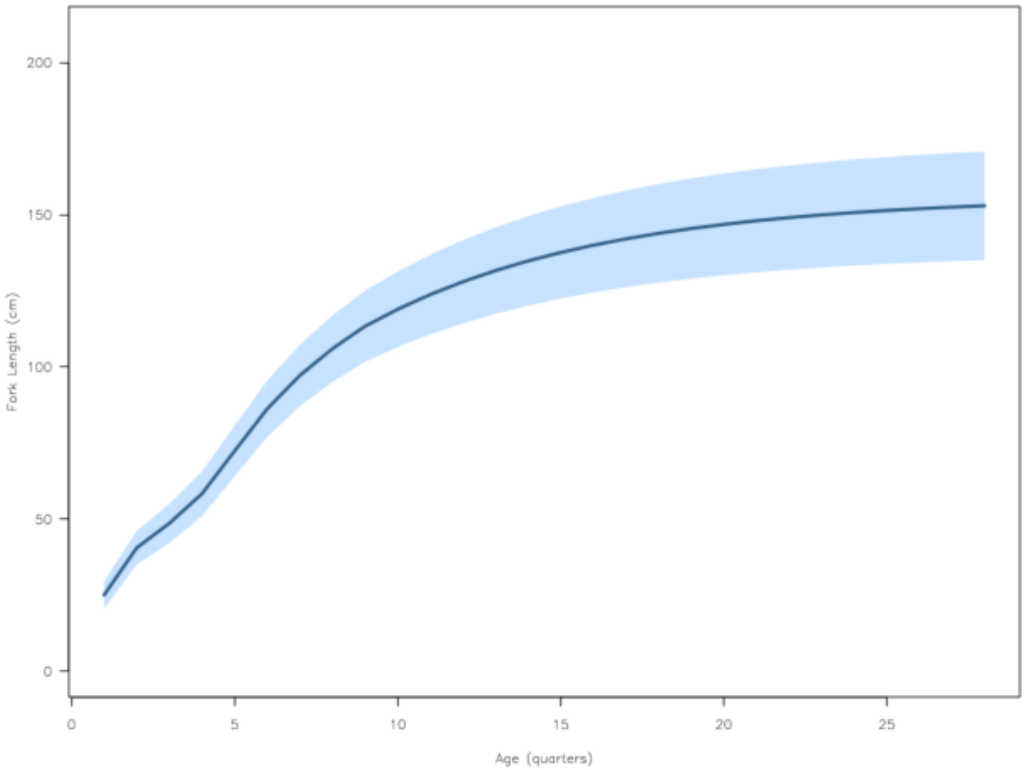

Figure 8. Yellowfin tuna: estimated growth for the diagnostic case model. The blue line represents the estimated mean fork length (cm) at-age and the blue region represents the length-at-age within one standard deviation of the mean, for the diagnostic case model (from Tremblay-Boyer et al. 2017).

Reproduction and Recruitment

Yellowfin tuna start to mature at 5 years of age but when information on sex ratios, maturity at age, fecundity, and spawning fraction are included, the reproductive output is found to peak between 10 and 15 years of age (Figure 9). Spawning occurs throughout the year in the core areas of distribution with peaks observed in the northern and southern summer months respectively. Individuals may spawn every few days over the spawning period. Larval distribution in equatorial waters is transoceanic year-round, but there are seasonal changes in larval density in subtropical waters.

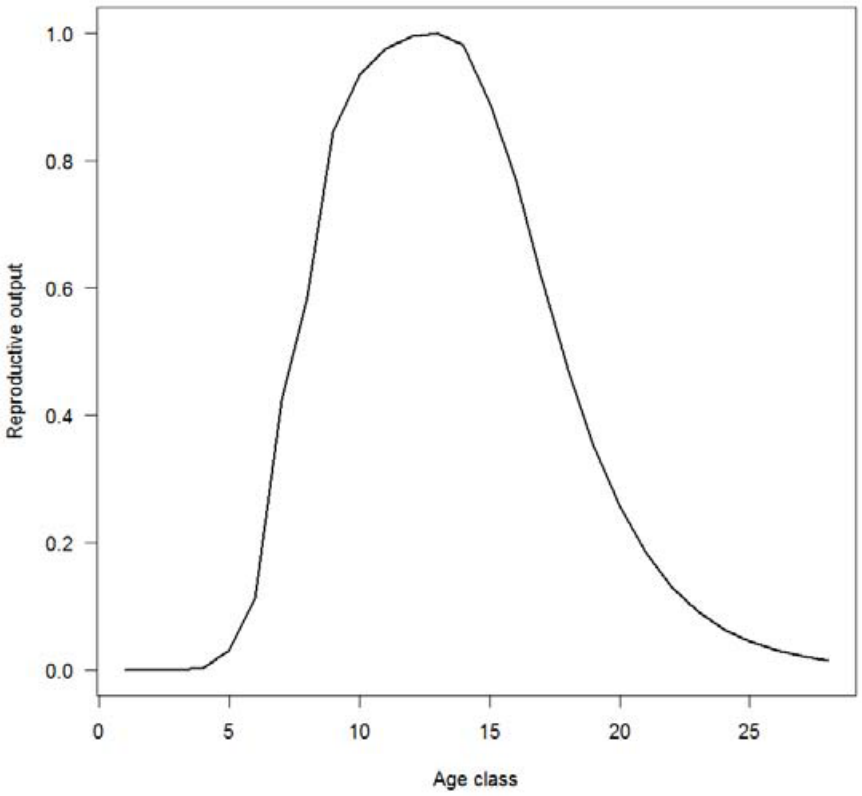

Figure 9. Yellowfin tuna: Index of spawning potential incorporating information on sex ratios, maturity at age, fecundity, and spawning fraction (from Davies et al. 2014).

Distribution and Stock Structure

Yellowfin tuna are found worldwide in tropical and subtropical seas. The thermal boundaries of occurrence are roughly 18° and 31°C.

Although the distribution of yellowfin tuna in the Pacific is nearly continuous, lack of evidence for long-ranging east-west or north-south migrations of adults suggests there is little exchange between yellowfin tuna from the eastern and the central Pacific, nor between those from the western and the central Pacific. This suggests the existence of subpopulations and although early publications have suggested limited variation within the Pacific (Ward et al. 1994), recent studies with improved techniques have suggested a finer scale genetic stock structure (Aguila et al. 2015; Grewe et al. 2015; Grewe et al. 2016) that is not considered within the current stock assessment (Tremblay-Boyer et al. 2017).

Nevertheless, for the purpose of WCPFC yellowfin stock assessments, the stock within the domain of the model area (essentially the WCPO, west of 210°E) has been considered as a discrete stock unit (Davies et al. 2014). This area has been disaggregated into model regions (Figure 10) so as to describe to some extent spatial processes (such as recruitment and movement) and fishing mortality within regions (Tremblay-Boyer et al. 2017).

There is a large amount of tagging data (1989-2012) indicating extensive latitudinal movements among the equatorial regions and a level of longitudinal movements to and from the sub-tropical latitudes (Figure 11). The movement of tagged fish among regions is used in the stock assessment to estimate movement coefficients among different regions. A new regional structure proposed for the current stock assessment, with region boundaries shifted from 20° N to 10° N, was suggested by the Pre-Assessment Workshop based on few movements between tropical tag release sites and temperate zones for bigeye tuna (McKechnie et al. 2017a).

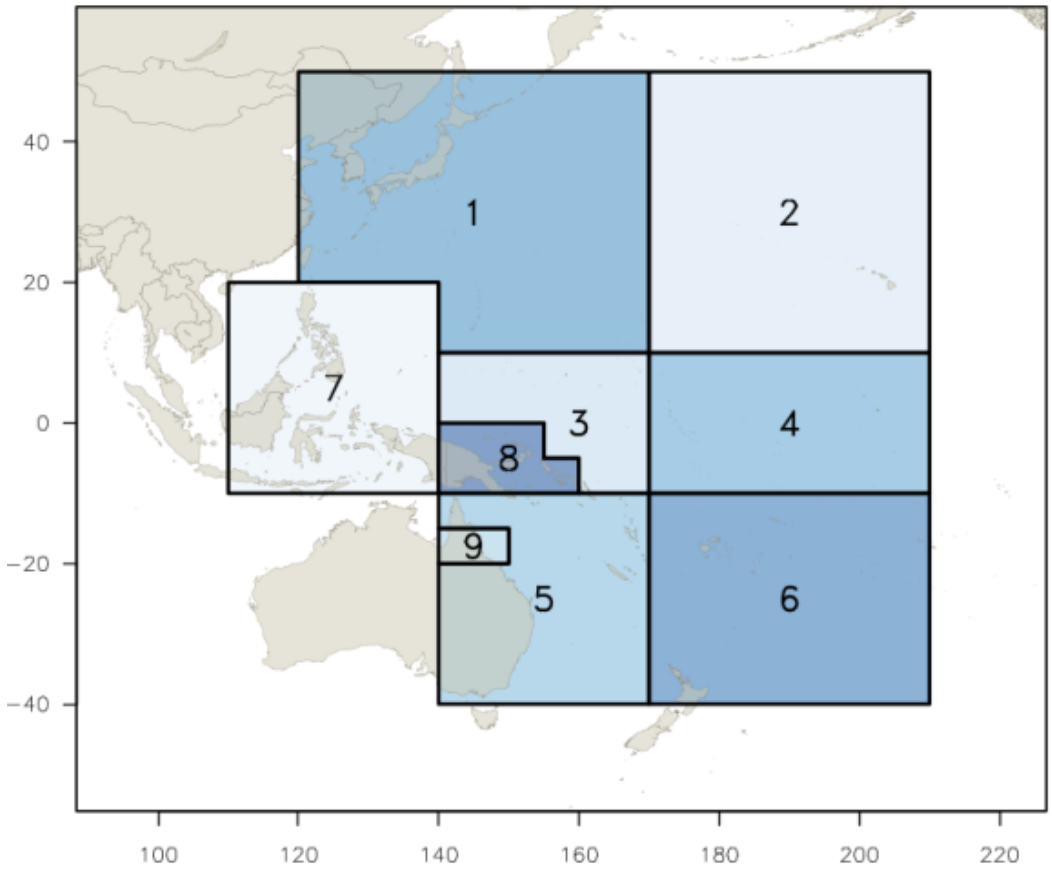

Figure 10. Yellowfin tuna: the geographical area covered by the stock assessment and the boundaries for the 9 regions when using the "2017 regional structure" (from Tremblay-Boyer et al. 2017).

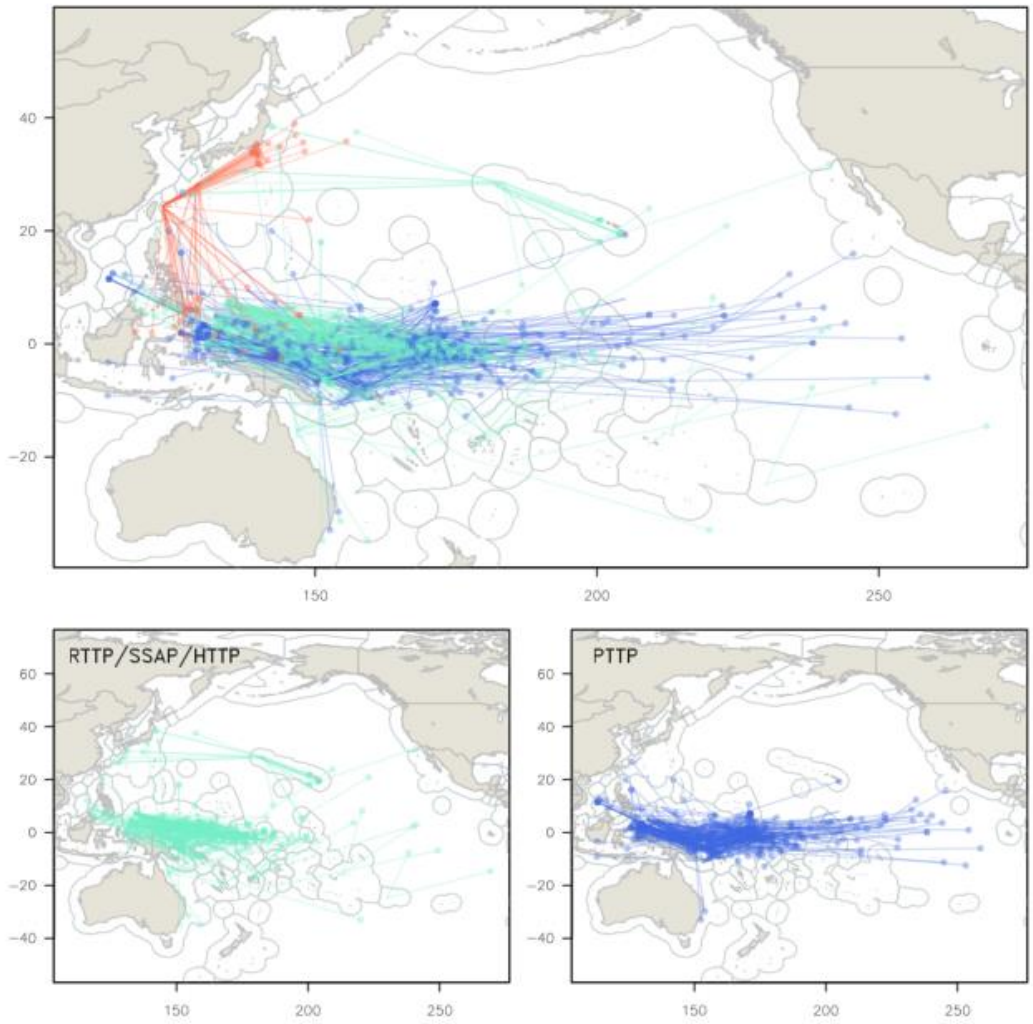

Figure 11. Map of the movements of tagged yellowfin tuna released in the Pacific Ocean and subsequently recaptured more than 1,000 nautical miles from their release site. Plots represent recaptures from different tuna tagging programs. (from Tremblay-Boyer et al.2017).

Yellowfin - Stock assessment

Stock assessments for yellowfin tuna have been conducted regularly and almost annually since 1999. Furthermore, an independent review of the 2011 bigeye tuna assessment (Lanelli et al. 2012) had several recommendations for improvement that apply equally to the yellowfin assessment, and these have been incorporated into the current assessment wherever possible.

The assessment model is run in Multifan-CL (MFCL), which provides a Bayesian framework. MFCL requires that 'fisheries' are defined with as near as possible constant selectivity and catchability. For each fishery, the assessment uses catch data, effort data (in the form of standardised CPUE time series), time series of size data, externally estimated growth functions, and tagging data. The model can be considered to consist of several components, (i) the dynamics of the fish population; (ii) the fishery dynamics; (iii) the dynamics of tagged fish; (iv) the observation models for the data; (v) the parameter estimation procedure; and (vi) stock assessment interpretations. Detailed technical descriptions of components (i)–(iv) are given in Hampton and Fournier (2001) and Kleiber et al. (2017).

Age / spatial structure: The model is structured into 9 regions and 28 quarterly age classes (the last a plus group).

Growth: Growth was assumed to be invariant by region and sex. It has been noted that growth of smaller fish (up to ~80cm) may not conform to a von Bertalanffy (VB) curve, so the mean length of the first 8 quarterly age-classes were set as independent parameters, with the mean lengths for the remaining age-classes following a VB growth model.

Steepness: Fixed at 0.8, with 0.65 and 0.95 tested as sensitivities (as all the main WCPFC tuna stocks).

Recruitment: Recruitment occurs in the model at age one, instantaneously at the beginning of each quarter. The stock-recruit relationship is considered weak (i.e. weak penalty for deviating from it); the six terminal quarterly recruitments are set at the mean of assessment period; the distribution of recruitment across regions is allowed to vary over time.

Natural mortality: *M* assumed to vary between males and females (because there is a larger proportion of males in the largest size classes); *M* is calculated externally by length and then converted to M-at-age using the growth curve; this *M* vector is put into the model as fixed values.

Maturity: The assessment estimates 'spawning potential' rather than spawner biomass, with the objective of estimating directly the relevant contribution to the next generation. This is a function of sex ratio at age, female maturity at age, female spawning frequency at age and female fecundity at age. As for *M*, this function is calculated by length and then back-transformed to age using the growth function.

Selectivity: Modelled using a variety of functions and methods (cubic spline smoothing, logistic function), depending on the fishery. Fisheries can 'share' selectivity if their characteristics are similar, to reduce the number of model parameters

Catchability: Constant catchability is assumed for fisheries where there is standardised CPUE (i.e. the model assumes that standardised CPUE is an index of abundance); otherwise catchability is allowed to vary over time (every 2 years).

The most recent assessment (Tremblay-Boyer et al. 2017) was an update of the previous assessment (Davies et al. 2014) but also addressed relevant recommendations of that assessment report, including an investigation of an alternative regional structure, exploration of uncertainties in the assessment model, particularly in response to the inclusion of additional years of data, and improving diagnostic weaknesses of previous assessments. It used data from 1952 to 2015, in quarterly timesteps; 2016 data being too preliminary at the time of assessment.

In addition to the diagnostic case model, it reported the results of one-off sensitivity models to explore the relative impacts of key data and model assumptions for the diagnostic case model on the stock assessment results and conclusions. It also undertook a structural uncertainty analysis (model grid) for consideration in developing management advice where all possible combinations of the most important axes of uncertainty from the one-off models were included. The grid contains all combinations of two or more parameter settings or assumptions for each uncertainty axis. The axes are generally selected from the one-off sensitivities with the aim of providing an approximate understanding of variability in model estimates due to assumptions in model structure, not accounted for by statistical uncertainty estimated in a single model run, or over a set of one-off sensitivities. The structural uncertainty grid for the 2017 assessment was constructed from 5 axes: steepness (3 settings), tagging data overdispersion (2), tag mixing (2), size data weighting (3) and regional structure (2). Initially the grid consisted of 48 models as only two size weighting had been applied, subsequently a third was added (see under 'sensitivities' below), so the final grid comprised 72 model runs.

In comparison to previous assessments, less emphasis was placed on the diagnostic case model. Instead, Tremblay-Boyer et al. (2017) recommended that management advice be formulated from the results of the structural uncertainty grid and a selection of 48 of the 72 runs were selected by the SC as the basis for this advice (Table 8, Figure 12). In this selection of runs, the lower 10 percentiles for $SB_{latest}/SB_{F=0}$ and $SB_{recent}/SB_{F=0}$ were 1.02 and 1.05 respectively, indicating that the stock was close to the point at which there would no longer be a high degree of certainty (95% probability) that it was still above the LRP of 20% $SB_{F=0}$.

Across the range of model runs in this assessment, the key factor influencing estimates of stock status was the size data weighting value. Down-weighting the influence of the size data led to more pessimistic stock status estimates.

Based on the results of the model grid, the general conclusions were:

1. The grid contained a wide range of models with some variation in estimates of stock status, trends in abundance and reference points. However, biomass was estimated to have declined throughout the model period for all models in the grid. Those declines were found across most tropical and temperate regions of the model.

2. Across the model grid, the terminal depletion estimated for the majority of runs estimates stock status levels to be above the 20% $SB_{F=0}$. The range of $SB_{latest}/SB_{F=0}$ values was 0.18 to 0.45. Only two runs (<5%) fell below the LRP of 20% $SB_{F=0}$. The median estimate (0.33) was comparable to that estimated from the 2014 assessment grid, noting the differences in grid uncertainty axes used in the two assessments (Figure 12).

3. Corresponding estimates of F_{recent}/F_{msy} ranged from 0.58 to 1.13, with 2 out of the 48 runs (<5%) indicating that $F_{recent}/F_{msy} > 1$. The median estimate (0.75) was also comparable to that estimated from the 2014 assessment grid.

4. Fishing mortality for adult and juvenile yellowfin tuna was estimated to have increased continuously since the beginning of industrial tuna fishing (seen in the diagnostic case model). In general, these had been on average higher for juveniles, but in recent years adult fishing mortality had also increased. A significant component of the increase in juvenile fishing mortality was attributable to the Philippines, Indonesian and Vietnamese surface fisheries, which have the most uncertain catch, effort and size data. The work of the WPEA project to assist in enhancing the current fishery monitoring programme and improving estimates of historical and current catch from these fisheries remains important given the contribution of these fisheries in the overall fishing impact analyses from this assessment.

5. The significance of the recent increased recruitment events and the progression of these fish to the spawning potential component of the stock were encouraging, although whether this was a result of management measures for the fishery or beneficial environmental conditions was currently unclear. It was noteworthy, however, that recent favourable recruitment events had also been estimated for skipjack (McKechnie et al., 2016a, 2016b) and bigeye (McKechnie et al., 2017a) in the WCPO, and bigeye in the EPO (Aires-da Silva et al., 2017), which may give weight to the favourable environmental conditions hypothesis. Whether these trends are maintained in coming years will help separate these factors and will likely provide more certainty about the future trajectories of the stock.

6. There remained a range of other model assumptions that should be investigated either internally or through directed research. Briefly, the apparent non-linear impact of the weighing on the size composition data on population estimates, and the conflict between the abundance indices and the tagging data for region 8 were worthy of note. Also, biological studies to improve our estimates of growth of yellowfin within the WCPO, for instance through direct ageing of otoliths as was done in bigeye, should be considered a high priority.

The impact of longline fishing is important, but it is spatially variable and has declined in recent years (Figure 13). Over the period 1965-2014, recruitment on average displays very little trend and the uncertainty decreases substantially since the mid 1965s (Figure 14). Biomass has declined steadily over the model period but in the most recent years, that decline has slowed, and shows a small increase in the last two years (Figure 15). Although the age-specific selectivity patterns produce a much higher MSY in the early period of the fishery compared to the recent estimates, the catch has always been less than MSY (Figure 16).

Table 8. Yellowfin tuna: Summary of reference points over the 48 models in the structural uncertainty grid retained for management advice using divisors of 20 and 50 for the weighting on the size composition data. Note that $SB_{recent}/SB_{F=0}$ is calculated where SB_{recent} is the mean SB over 2012-2015 instead of 2011-2014 (used in the stock assessment report), at the request of the Scientific Committee (from WCPFC-SC 2017).

	Mean	Median	Min	10%	90%	Max
C_{latest}	611,982	612,592	606,762	607,517	614,237	614,801
MSY	670,658	670,800	539,200	601,480	735,280	795,200
$Y_{Frecent}$	646,075	643,400	534,400	586,120	717,880	739,600
F_{mult}	1.34	1.36	0.88	1.03	1.61	1.86
F_{MSY}	0.12	0.12	0.07	0.10	0.14	0.16
F_{recent}/F_{MSY}	0.77	0.74	0.54	0.62	0.97	1.13
SB_{MSY}	544,762	581,400	186,800	253,320	786,260	946,800
SB_0	2,199,750	2,290,000	1,197,000	1,366,600	2,784,500	3,256,000
SB_{MSY}/SB_0	0.24	0.24	0.15	0.18	0.28	0.34
$SB_{F=0}$	2,083,477	2,178,220	1,193,336	1,351,946	2,643,390	2,845,244
$SB_{MSY}/SB_{F=0}$	0.25	0.26	0.16	0.19	0.30	0.35
SB_{latest}/SB_0	0.33	0.34	0.18	0.23	0.42	0.45
$SB_{latest}/SB_{F=0}$	0.35	0.37	0.16	0.22	0.46	0.50
SB_{latest}/SB_{MSY}	1.40	1.39	0.80	1.02	1.80	1.91
$SB_{recent}/SB_{F=0}$	0.32	0.33	0.15	0.20	0.41	0.46
SB_{recent}/SB_{MSY}	1.40	1.41	0.81	1.05	1.71	1.93

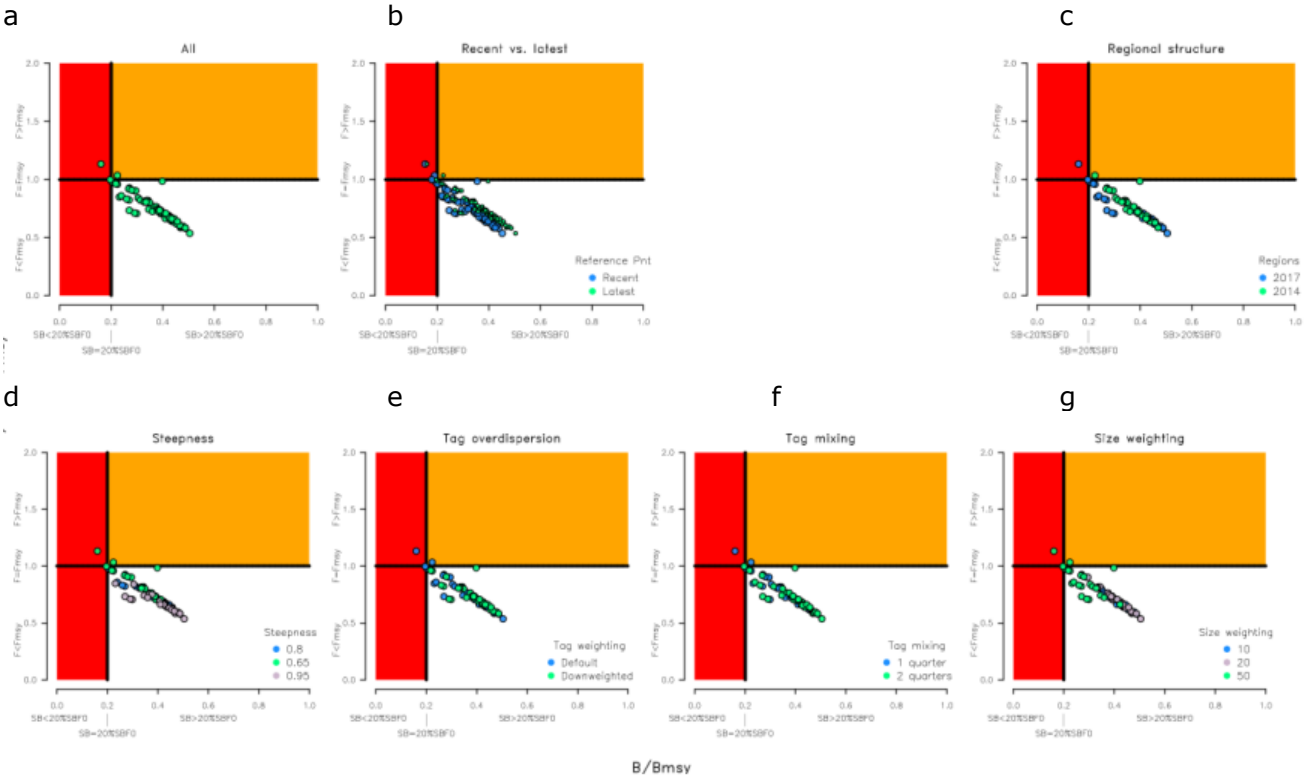

Figure 12. Yellowfin tuna: Majuro plots summarising the results for each of the models in the structural uncertainty grid. The plots represent estimates of stock status in terms of spawning biomass depletion (B/B_{msy} - X-axis) and fishing mortality (F/F_{msy} – Y-axis). The red zone represents spawning biomass levels lower than the agreed limit reference point, which is marked with the solid black line. The orange region is for fishing mortality greater than F_{MSY} (F_{MSY} is marked with the black dashed line). The points represent SB_{latest} /$SB_{F=0}$ for each model run except in panel (b) where SB_{recent} /$SB_{F=0}$ is also displayed. Panels (c)–(g) show the estimates for the different levels for the five axes of the grid. (from Tremblay-Boyer et al. 2017).

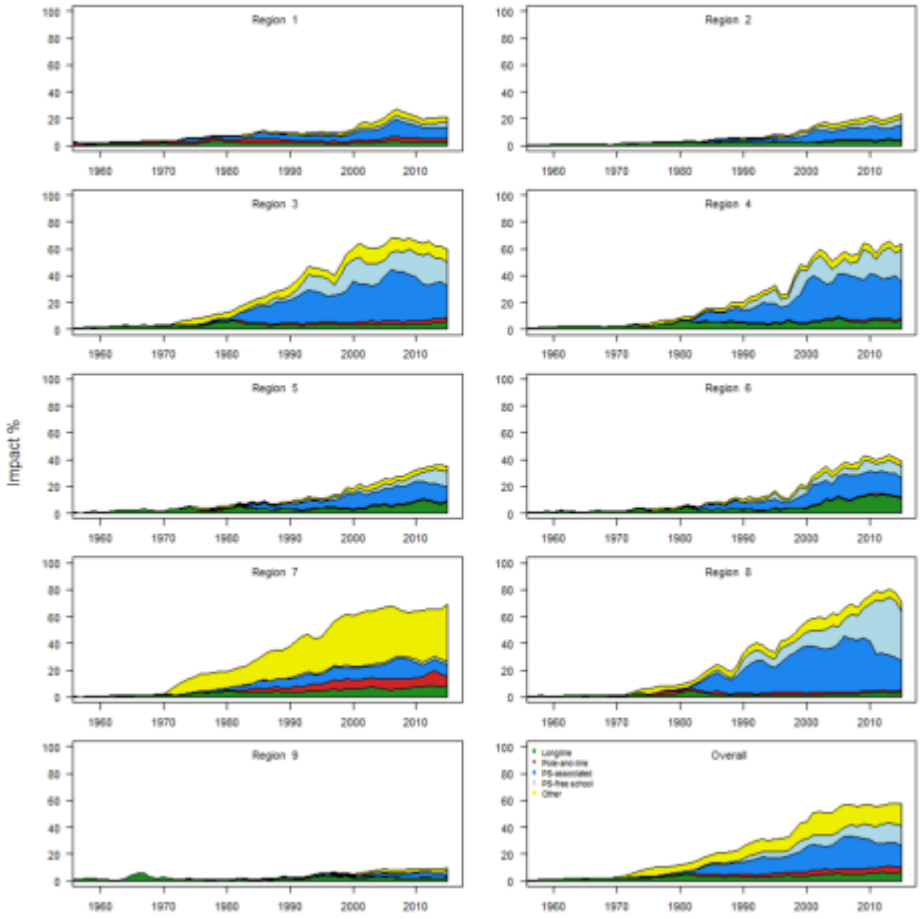

Figure 13. Yellowfin tuna: estimates of reduction in spawning potential due to fishing (fishery impact = 1 $-SB_{latest}/SB_{F=0}$) by region, and over all regions (lower right panel), attributed to various fishery groups for the diagnostic case model (from Tremblay-Boyer et al. 2017).

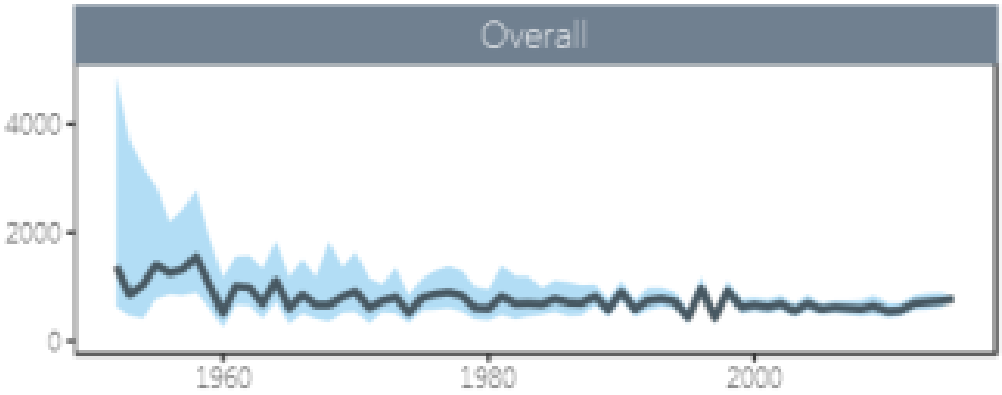

Figure 14. Yellowfin tuna: estimated annual, temporal recruitment (in millions with 95% confidence intervals as the blue shaded regions) for the whole WCPO for the diagnostic case model (from Tremblay-Boyer et al. 2017).

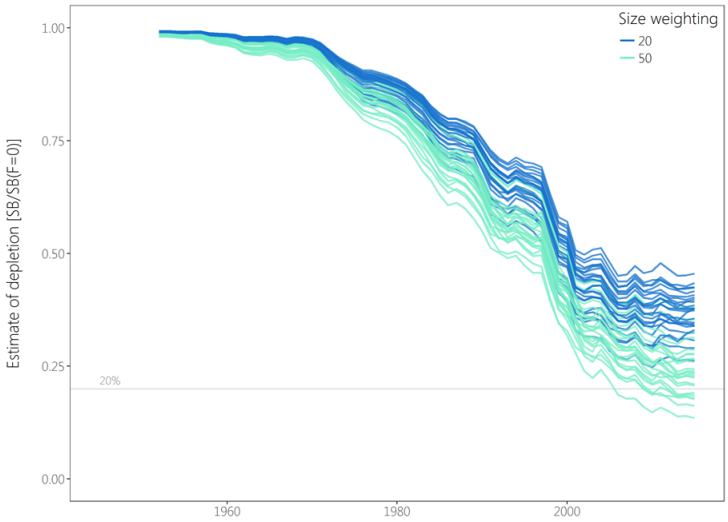

Figure 15. Yellowfin tuna: trajectories of fishing depletion (of spawning potential) for the 48 model runs retained for the structural uncertainty grid used for management advice. The colours depict the models in the grid with the size composition weighting using divisors of 20 and 50 (from WCPFC-SC 2017).

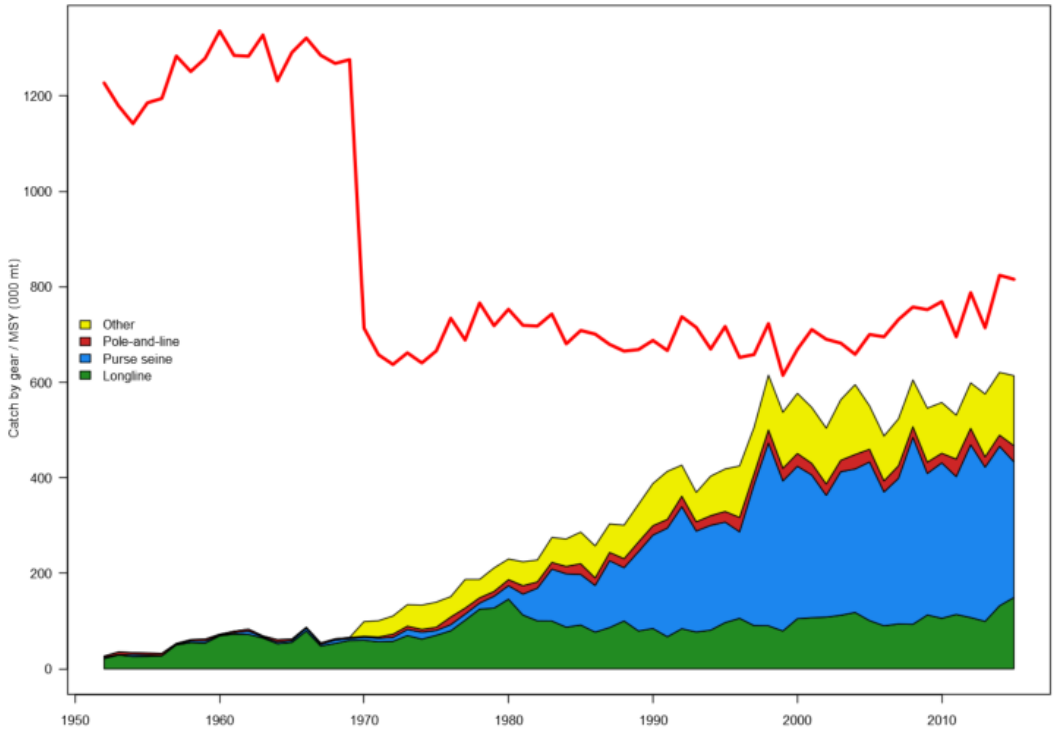

Figure 16. History of the annual estimates of MSY (red line) for the diagnostic case model compared with an annual catch by the main gear types (from Tremblay-Boyer et al. 2017).

Yellowfin - Harvest strategy

The WCPFC remains the most important level of management for yellowfin. Progress towards the development of a Harvest Strategy for yellowfin is evaluated based on the Harvest Strategy Workplan adopted by WCPFC for the key tuna species (Table 11). This indicates that there are still important decisions to be made concerning harvest control rules, but that progress has been consistent with the agreed plan.

Table 9. Work plan from WCPFC14 (2017)[1] for yellowfin tuna for the adoption of harvest strategies under CMM 2014-06. Bold items are the six elements that are referred to in CMM 2014-06 (a. Objectives, b. Reference Points, c. Acceptable Levels of Risk, d. Monitoring, e. Harvest Control Rules and f. MSE). Items in brackets are related to harvest strategy development, are part of the plan, but are not one of these six elements.

Year	Activity
2017	**Performance indicators and Monitoring strategy (d).** • Scientific Committee (SC) provides advice on a range of performance indicators for the Tropical Longline Fishery to evaluate the performance of harvest control rules. • Commission noted performance indicators for the Tropical Longline Fishery to evaluate harvest control rules
	2017 Progress summary: • Recognized the importance of developing harvest strategies for key stocks in the WCPO. The Commission recognized that this work requires the consideration of fisheries managers and scientists at different stages. The Commission notes that the time required for harvest strategy discussions is substantial but will also vary from year to year and the Commission recognized the need for this to be accommodated. • Agreed to reprioritize as needed the annual agenda of the Commission and Scientific Committee to allow sufficient additional time for consideration of harvest strategy issues. In addition, WCPFC recognized that there may also be a need for a dedicated science/management dialogue.
2018	• [SC and Commission discussion of management objectives for fisheries and/or stocks, and subsequent development of candidate TRPs for BET and YFT.]
2019	**Agree on Target Reference Point (b).** • SC provides advice on potential Target Reference Points for yellowfin. • Commission agrees on a TRP for yellowfin. **Develop harvest control rules (e)** and **Management strategy evaluation (f)** • SC provides advice on the performance of candidate harvest control rules. (ongoing). • Commission consider advice on progress towards harvest control rules. (ongoing).
2020	**Develop harvest control rules (e)** and **Management strategy evaluation (f)** • SC provides advice on the performance of candidate harvest control rules. (ongoing). • TCC consider the implications of candidate harvest control rules. (ongoing). • Commission consider advice on progress towards harvest control rules. (ongoing).
2021	**Develop harvest control rules (e)** and **Management strategy evaluation (f)** • SC provides advice on the performance of candidate harvest control rules. • TCC consider the implications of candidate harvest control rules. • Commission consider advice on progress towards harvest control rules. **Adopt a Harvest Control Rule**

[1] The workplan for yellowfin tuna was again modified in 2018 but, in response to a Variation Request from all CABs, the 2017 version of the Workplan has been agreed as the fixed timeline for all conditions concerning adoption all elements of harvest strategies for WCPFC tuna stocks. The 2018 updates to the Workplan are therefore not considered further here. More information on this Variation Request is provided in Section 8.7 on Harmonized Fishery Assessments.

Bigeye tuna

Biology

Bigeye tuna (*Thunnus obesus*) inhabit the tropical and temperate waters of the Pacific Ocean between northern Japan (40°N) and the north island of New Zealand (40°S) in the west, and from 40°N to 30°S in the east, except near coastal waters of Central America between 5° and 20°N (Hampton et al. 1998). In the WCPO, logsheet and observer records exist between 40°N and 45°S (Molony 2008). Genetic analyses have failed to reveal significant evidence of widespread population subdivision in the Pacific Ocean (Grewe and Hampton 1998). While these results are not conclusive regarding the rate of mixing of bigeye tuna throughout the Pacific, they are broadly consistent with the results of SPC's and IATTC's tagging experiments on bigeye tuna. Recent tagging work, however, has suggested that while bigeye tuna in the far eastern and western Pacific may have relatively little exchange, those in the central part of the Pacific between about 180° and 120°W may mix more rapidly over distances of 1000–3000 nautical miles. It is now clear that there is extensive movement of bigeye across the nominal WCPO/EPO boundary of 150°W. Nevertheless, stock assessments of bigeye tuna are routinely undertaken separately for the WCPO and EPO.

Juvenile bigeye tuna and small adults school at the surface in mono-species groups or mixed with other tunas and may be associated with floating objects. Adults stay in deeper waters. Bigeye tuna feed on a wide variety of fishes, cephalopods, and crustaceans during the day and at night.

Available data for the WCPO indicate that bigeye tuna become reproductively active from about 100 cm FL and that 100% of individuals >120 cm FL are reproductively mature. Regional variation in maturity-at-length is suspected to occur, and bigeye tuna appears to be reaching maturity at larger sizes in the EPO. Bigeye tuna are multiple spawners that may spawn every 1 or 2 days over several months over periods of the full moon throughout the year in tropical waters. Eggs and larvae are pelagic.

Integrated analyses of tag-recapture and age-at-length data for EPO bigeye (Aires-da-Silva et al. 2014) have estimated lengths (cm) at age (yr) of 1: 55, 2: 91, 3: 123, 4: 147, 5: 165, 6: 177, 7: 185, 8: 191, 9: 194, 10: 196. These mean lengths-at-age are larger than those estimated internally in bigeye WCPO stock assessments, based on fitting to size frequency data.

The natural mortality rate of bigeye tuna is likely to vary with size, with the lower rates of around 0.5/yr for bigeye >40 cm FL (Hampton 2000). Tag-recapture data indicate that significant numbers of bigeye reach at least eight years of age (Hampton and Williams 2005). The longest period at liberty for a recaptured bigeye tuna tagged in the western Pacific at about 1-2 years of age is currently 14 years (SPC unpublished data). Natural mortality of female bigeye is hypothesized to increase at around the age of reproductive maturity, due to the physiological stresses of spawning, resulting in male-biased sex ratios at a larger size. A more detailed summary of bigeye tuna biology is provided by Molony (2008).

In the WCPO, bigeye tuna are mostly caught as adults by the longline fishery, and as juveniles by the purse seine fishery (McKechnie et al. 2017a). The early impacts on the population were primarily attributable to longline fishing, but in recent years, at the WCPO level, the impacts of associated purse seine sets and longline fishing were estimated to be similar (Harley et al. 2014).

Bigeye - Stock assessment

The most recent re-assessment for bigeye tuna was presented to the WCPFC-SC in 2018 (Vincent et al. 2018) and confirmed the more optimistic assessment of stock status based on new estimates of bigeye growth that the previous assessment (McKechnie et al. 2017a) had produced. The general conclusions of this assessment were as follows:

- Models that assume the "Updated New growth" estimate depletion to be median($SB_{recent}/SB_{F=0}$) = 0.358 with an 80% probability interval of 0.295 to 0.412 and all models estimate stock above 20%$SB_{F=0}$ (Table 10).
- All models that assume "Updated New growth" estimate a recent recruitment event that has increased spawning potential in the last several years, and it is expected that for the "Old growth" models these recruits will soon progress into the spawning potential and improve the stock status, at least in the short-term.
- Only the "Old growth" and 20° N boundary models estimate spawning potential to be below 20%$SB_{F=0}$ for all models in the set. These models estimate median ($SB_{recent}/SB_{F=0}$) = 0.188 with an 80% probability interval of 0.123 to 0.275, which is consistent with the structural uncertainty grid of the 2017 assessment.
- Using a weighting of 3:1 "Updated New: Old growth" as defined by SC13, the recent depletion estimates were median ($SB_{recent}/SB_{F=0}$) = 0.334 with an 80% probability interval of 0.157 to 0.403. Of the 144 weighted runs, 21 (14.58%) estimated $SB_{recent}/SB_{F=0}$ below the LRP of 20%$SB_{F=0}$.
- Across the weighted grid, exploitation was estimated at median (F_{recent}/F_{MSY}) = 0.813 with an 80% probability interval of 0.682 to 1.245, where 32 of the 144 models estimated F_{recent}/F_{MSY} > 1 (22.22%).

The time series of recent catches are shown in Figure 17. Trajectories of stock depletion are shown in Figure 18 and assessment results are summarised in Figure 19.

The WCPFC-SC14 (WCPFC-SC 2018) agreed to use only the "updated new growth" model to describe the stock status because it considered this to be the best available scientific information. Its advice was:

- Based on the uncertainty grid adopted by SC14, the WCPO bigeye tuna spawning biomass was above the biomass LRP and recent F was very likely below F_{MSY}. The stock was not experiencing overfishing (94% probability $F<F_{MSY}$) and it was not in an overfished condition (0% probability $SB/SB_{F=0}$<LRP).
- Although SC14 considered that the updated assessment was consistent with the previous assessment, SC14 also advised that the amount of uncertainty in the stock status results for the 2018 assessment update was lower than for the previous assessment due to the exclusion of old information on bigeye tuna growth.
- SC14 noted that levels of fishing mortality and depletion differ among regions, and that fishery impact was higher in the tropical region (Regions 3, 4, 7 and 8 in the stock assessment model), with particularly high fishing mortality on juvenile bigeye tuna in these regions. SC14, therefore, recommended that WCPFC15 could continue to consider measures to reduce fishing mortality from fisheries that take juveniles, with the goal to increase bigeye fishery yields and reduce any further impacts on the spawning biomass for this stock in the tropical regions.

Bigeye - Management

CMM 2018-01 contains the latest management measures introduced by the WCPFC for bigeye tuna (and for skipjack and yellowfin). The 2017 and 2018 versions of this CMM removed specific objectives that were in earlier versions that the fishing mortality rates for the key tuna species be reduced to or maintained at levels less than F_{MSY} and replaced these firstly with a general statement of the purpose of the CMM:

"Pending the establishment of harvest strategies, and any implementing CMM, the purpose of this measure is to provide for a robust transitional management regime that ensures the sustainability of bigeye, skipjack, and yellowfin tuna stocks."

In addition, an interim target is provided for bigeye tuna (paragraph 12):

"Pending agreement on a target reference point the spawning biomass depletion ratio ($SB/SB_{F=0}$) is to be maintained at or above the average $SB/SB_{F=0}$ for 2012-2015."

Nevertheless, the general objective remains articulated under the section titled "Principles for Application of the Measure":

"… Measures shall ensure, at a minimum, that stocks are maintained at levels capable of producing maximum sustainable yield…"

The Longline measures contained in paragraphs 39-44 and Table 3 of CMM 2018-01 mostly do not apply to the Solomon Islands fleet. Paragraph 43, which restricts catches to a maximum of 2,000 t for Members that had caught less than this quantity in 2004, is the only measure of potential application to the UoA. However, Solomon Islands exercises a Small Islands Development State (SIDS) exemption to this limit, under Paragraph 5. Also, the paragraphs on Capacity Limits for Longline vessels in paragraphs 47 – 49 specifically exclude SIDS from their scope. The focus of this CMM for bigeye tuna on other catching nations and on purse seine catches by Fish Aggregation Device (FAD) sets reflects these as having the major impacts on the resource.

Information

The information available on bigeye tuna is generally the same as for the other target species and is collected mainly by the combination of vessel logbooks and observer programs as outlined in section 3.2 above. It includes data on catch weight and effort at an operational level for most fleets, size composition data from observers, tagging data and a range of biological data.

Table 10. Bigeye tuna. Summary of reference points over the 36 models in the structural uncertainty grid within the subset of "Updated New growth" models (both 10°N and 20°N regions) (from Vincent et al. 2018).

	Mean	Median	Min	10	90	Max
C_{latest}	152148	151846	148888	148936	154971	155577
$Y_{F_{recent}}$	154180	153220	133120	141140	170720	172280
f_{mult}	1.291	1.301	0.946	1.075	1.499	1.690
F_{MSY}	0.050	0.049	0.044	0.045	0.054	0.056
MSY	158551	159020	133520	143040	173880	180120
$F_{recent}/F_{\mathrm{MSY}}$	0.789	0.768	0.592	0.667	0.931	1.058
SB_0	1674833	1675500	1261000	1415500	1941000	2085000
$SB_{F=0}$	1841609	1858775	1509007	1632014	2043108	2139644
SB_{MSY}	471956	476050	340700	386600	577400	614200
SB_{MSY}/SB_0	0.281	0.280	0.260	0.262	0.300	0.302
$SB_{MSY}/SB_{F=0}$	0.255	0.255	0.226	0.235	0.280	0.287
SB_{latest}/SB_0	0.456	0.456	0.346	0.392	0.523	0.568
$SB_{latest}/SB_{F=0}$	0.414	0.420	0.298	0.351	0.480	0.526
$SB_{latest}/SB_{\mathrm{MSY}}$	1.633	1.624	1.146	1.306	1.933	2.187
$SB_{recent}/SB_{F=0}$	0.353	0.358	0.251	0.295	0.412	0.452
$SB_{recent}/SB_{\mathrm{MSY}}$	1.394	1.377	0.963	1.117	1.659	1.879

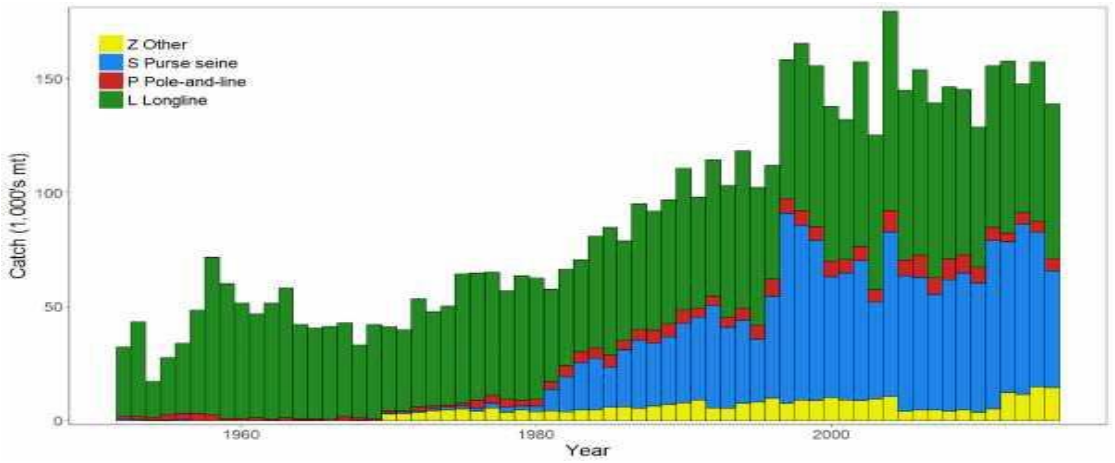

Figure 17. Bigeye tuna. Time series of total annual catch (1000's mt) by fishing gear over the full assessment period (from WCPFC-SC 2018).

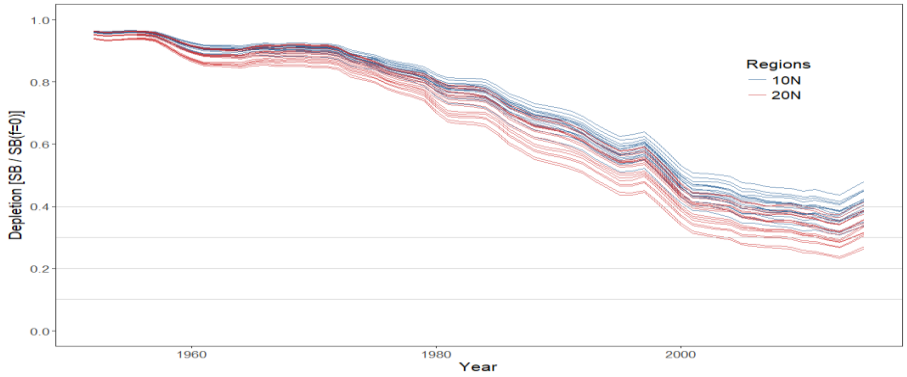

Figure 18. Bigeye tuna. Trajectories of spawning biomass depletion for the 36 model runs included in the structural uncertainty grid. The colours depict the models in the grid with the 10°N and 20°N spatial structures (from WCPFC-SC 2018).

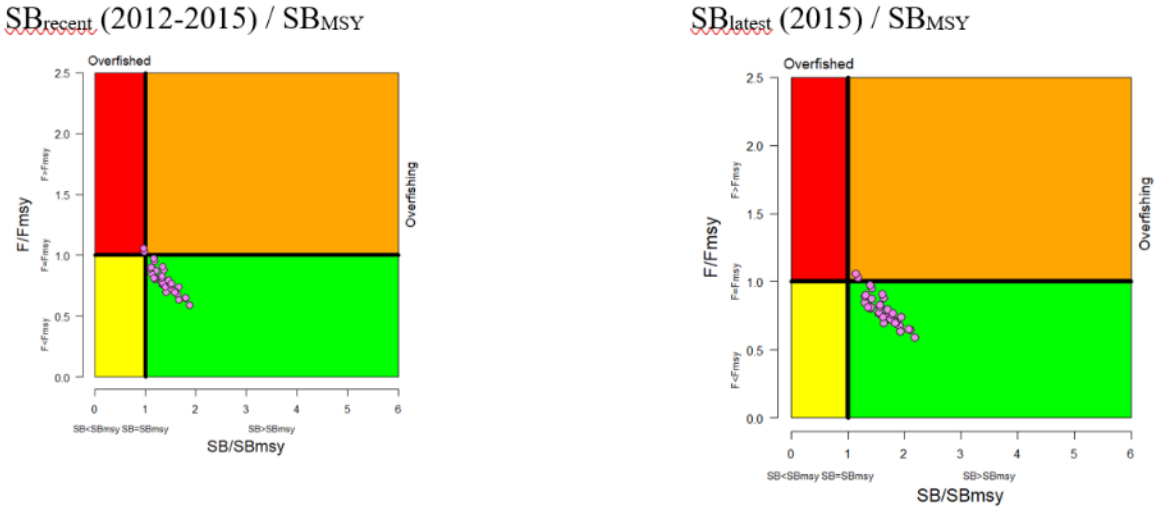

Figure 19. Bigeye tuna. Kobe plot summarising the results for each of the models in the structural uncertainty grid. On the left, the points represent $SB_{recent}/SBMSY$, where SB_{recent} is the mean SB over 2012-2015. On the right, the points represent SB_{latest}/SB_{MSY}, where SB_{latest} is from 2015 (from WCPFC-SC 2018).

Swordfish

Swordfish are widely distributed globally between ~50°N and S – i.e. in all longitudes in the Pacific Ocean. They are sexually dimorphic – female grow larger and faster than males, and may live in different areas, although overall, sexual differences in life-history characteristics (e.g. movement patterns, natural mortality etc.) are not well known. The most recent stock assessment notes that 'there remains a large degree of uncertainty about some of the basic biological characteristics of this species' (Davies et al., 2013 and references therein). Further details on swordfish growth and natural mortality schedules (which are a key issue for stock assessment) are given below. No information is available on changes over time in life history traits, if any.

As would be expected from their wide latitudinal distribution, swordfish appear to be very adaptable, with the ability to exploit a wide variety of habitats. In the Tasman Sea, they have been shown to move seasonally between different areas and depths and seem to track the thermal structure of the ocean environment, which most likely serves as a proxy for prey distribution (e.g. accumulation of prey in areas by physical advection or higher productivity associated with thermoclines or fronts). Tagging studies suggest swordfish may divide into 'resident' vs 'migratory'. However, it is not known if this represents different foraging strategies, differences between genders or age classes, movements between spawning and foraging grounds, or simply opportunistic change in behaviour.

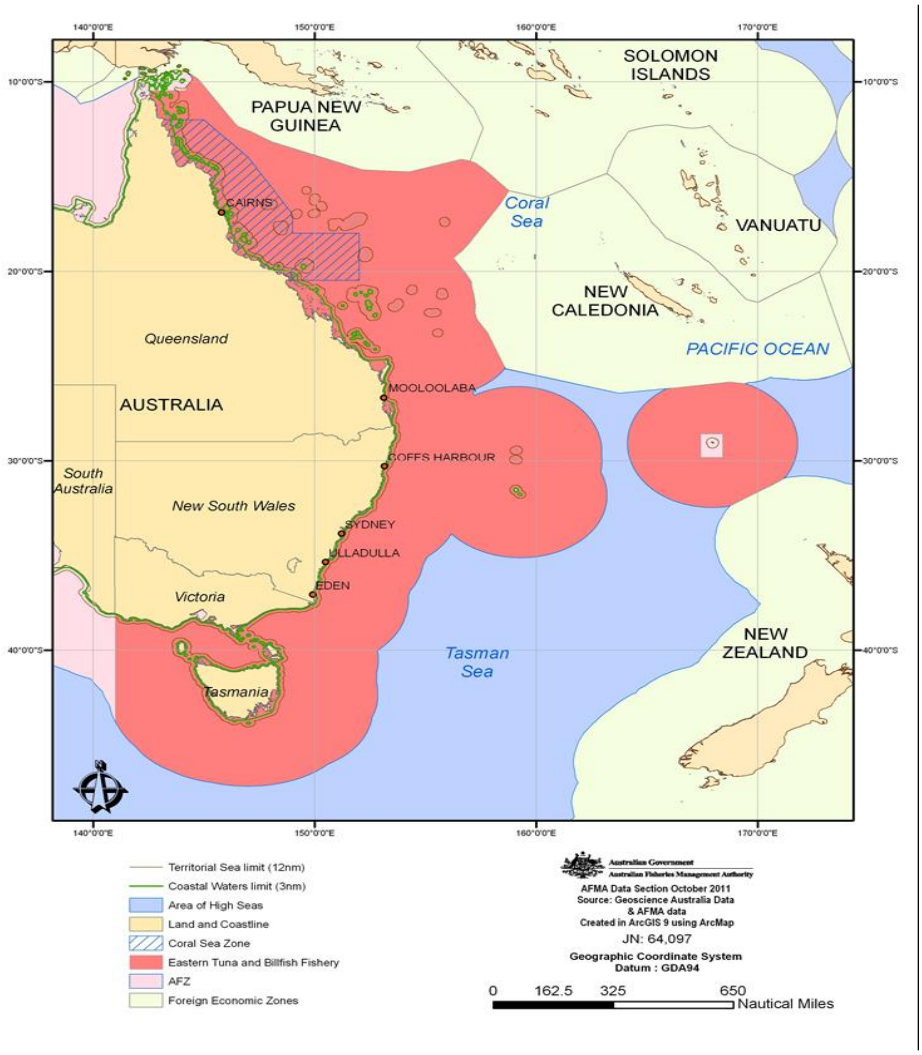

Figure 20. Area of the Eastern Tuna and Billfish Fishery; red=Australian EEZ, yellow=other EEZs, blue=high seas. Mooloolaba (S. Queensland) is one of the main ports of operation for the ETBF and home of Walker Seafoods Australia (Source: AFMA website).

In the Tasman Sea and Australian zone, at least a proportion of the swordfish population are thought to follow an annual migratory pattern from spawning grounds in the Coral Sea south through the fishing grounds off southeast Queensland, then southeast towards New Zealand and back to the Coral Sea (Figure 20). Higher densities of swordfish may also be found in the vicinity of seamounts, although it is not clear whether this represents directed migration to these areas or just a retention when they are encountered (Campbell, 2011).

Swordfish – Stock assessment

The 2017 stock assessment (Takeuchi et al. 2017) is the most recent for South Pacific Swordfish. It is an integrated assessment that has the same general characteristics of the models for the key tuna species. The assessment model is run in Multifan-CL (MFCL), which provides a Bayesian framework. MFCL requires that 'fisheries' are defined with as near as possible constant selectivity and catchability. For each fishery, the assessment uses catch data, effort data (in the form of standardised CPUE time series), time series of size data, externally estimated growth functions, and tagging data. The swordfish assessment used a combined two-region "south-western" and "south-central" spatial structure, based upon the results of electronic tagging programmes and comparable to the approach taken in 2013 (Figure 21). Substantial new information was been added to the assessment, including an additional four years of data. A new growth curve was used based on Farley et al. (2016), which resolved the earlier differences in growth estimated by PIFSC and CSIRO. The model included five standardised CPUE indices for longline fisheries. Model assumptions for fisheries selectivity and statistical weighting of the model fit to observations were also been updated.

The assessment also included a structural uncertainty analysis (model grid) for consideration in developing management advice where all possible combinations of the most important axes of uncertainty from the one-off models were included (Table 11). The grid contains all combinations of two or more parameter settings or assumptions for each uncertainty axis (Table 12).

Based on this assessment the advice from the WCPFC Scientific Committee (WCPFC-SC) was as follows:

The SC noted

- The central tendency of relative recent fishing mortality was median (F_{recent}/F_{MSY}) = 0.86 with an 80% probability interval of 0.51 to 1.23 (Table 12). While this suggested that there was likely a buffer between recent fishing mortality and F_{MSY}, it also showed that there was some probability that recent fishing mortality was above F_{MSY}.
- There was a roughly 32% probability (23 out of 72 models) that the recent fishing mortality was above F_{MSY} with Prob((F_{recent}/F_{MSY})>1) = 0.32. The median estimate (0.86) was above that estimated from the 2014 assessment grid ($F_{current}/F_{MSY}$ = 0.74, see SC9-SA-WP-05).
- Fishing mortality rate had increased notably from the mid-1990s in both model regions, on maturing swordfish aged 4-6 fish.
- Across all models in the uncertainty grid the spawning biomass declined steeply between the late 1990s and 2010 but since then the rate of decline had been less (Figure 22 and Figure 23). Those declines were found in both model regions but were higher in the eastern Region 2 (equator to 50°S, 165°E to 130°W).
- In comparison with the bigeye and yellowfin assessments, evidence for an increase in recent recruitment for southwest Pacific swordfish was not found in either the CPUE time series or estimates of recruitment. SC13 noted that the longline only nature of the fishery catching mainly larger, older swordfish, was not strongly informative with regards to recruitment dynamics.

The following were the SC's management advice and implications.

- Based on the uncertainty grid adopted by SC13, the south west Pacific swordfish spawning biomass was likely above the 20%$SB_{F=0}$, biomass LRP adopted for tunas and the SB_{MSY} level (noting that the Commission has yet to adopted an LRP for south Pacific swordfish) and it was highly likely that the stock was not in an overfished condition (0% probability). Recent F was likely below F_{MSY}, and it appeared that the stock was not experiencing overfishing (32% probability of overfishing) (Figure 24 and Figure 25).
- There had been an increase in fishing mortality notably from the mid-1990s, and that the biomass relative to unfished levels was estimated to have declined rapidly during the period late-1990s to 2010 followed by a more gradual but continued decline after 2010, across the uncertainty grid. It was noted the fishing mortality was likely below F_{MSY}.
- Consistent with its previous advice (from SC9), SC13 recommended that the Commission consider developing appropriate management measures for the area north of 20°S to the equator which is not covered by CMM 2009-03, noting that:
  recent catches between the equator and 20°S continued to represent the largest component of the catch in Region 2 (equator to 50°S, 165°E to 130°W) and represented half the total catches from the stock, and, catches in that area contributed substantially to fishing mortality and spawning biomass depletion levels in eastern Region 2 that are substantially higher than in the western region (Region 1, Figure 26).
- Further, SC13 recommended that current restrictions on catches south of 20°S also be maintained.

Table 11. Swordfish. Description of the structural sensitivity grid used to characterize uncertainty in the assessment (from WCPFC-SC 2017).

Axis	Levels	Option
Steepness	3	0.65, 0.80, 0.95
Diffusion rate	3	0, 0.11, 0.25
Size frequency weighting	2	Sample size divided by 20,40
Natural mortality vectors	4	M1,M2,M3, M4

Table 12. Swordfish. Summary of reference points over the 72 models in the structural uncertainty grid for management advice. Note that $SB_{recent}/SB_{F=0}$ is calculated where SB_{recent} is the mean SB over 2012-2015 instead of 2011-2014 (used in the stock assessment report), at the request of the Scientific Committee (from WCPFC-SC 2017).

¤	Mean¤	Median¤	Min¤	10%¤	90%¤	Max¤
C_{latest}¤	9,884¤	9,884¤	9,318¤	9,343¤	10,157¤	10,287¤
MSY¤	8,172¤	7,913¤	5,905¤	6,396¤	10,150¤	11,360¤
$Y_{Frecent}$¤	7,628¤	7,775¤	4,998¤	6,062¤	8,948¤	9,684¤
f_{mult}¤	1.27¤	1.15¤	0.66¤	0.79¤	1.89¤	2.32¤
F_{MSY}¤	0.16¤	0.14¤	0.10¤	0.10¤	0.22¤	0.23¤
$F_{recent}/F_{\mathrm{MSY}}$¤	0.88¤	0.87¤	0.43¤	0.53¤	1.26¤	1.51¤
SB_{MSY}¤	17,314¤	17,740¤	7,278¤	8,943¤	26,661¤	30,460¤
SB_0¤	84,173¤	84,075¤	57,070¤	71,199¤	98,039¤	111,000¤
SB_{MSY}/SB_0¤	0.20¤	0.21¤	0.11¤	0.12¤	0.28¤	0.28¤
$SB_{F=0}$¤	78,619¤	78,301¤	61,996¤	64,342¤	92,120¤	100,691¤
$SB_{\mathrm{MSY}}/SB_{F=0}$¤	0.22¤	0.23¤	0.10¤	0.12¤	0.32¤	0.33¤
SB_{latest}/SB_0¤	0.33¤	0.32¤	0.24¤	0.25¤	0.44¤	0.46¤
$SB_{latest}/SB_{F=0}$¤	0.35¤	0.35¤	0.26¤	0.27¤	0.44¤	0.49¤
$SB_{latest}/SB_{\mathrm{MSY}}$¤	1.85¤	1.61¤	0.85¤	0.99¤	3.14¤	4.05¤
$SB_{recent}/SB_{F=0}$¤	0.36¤	0.35¤	0.27¤	0.29¤	0.43¤	0.48¤
$SB_{recent}/SB_{\mathrm{MSY}}$¤	1.86¤	1.58¤	0.88¤	1.02¤	3.10¤	3.96¤

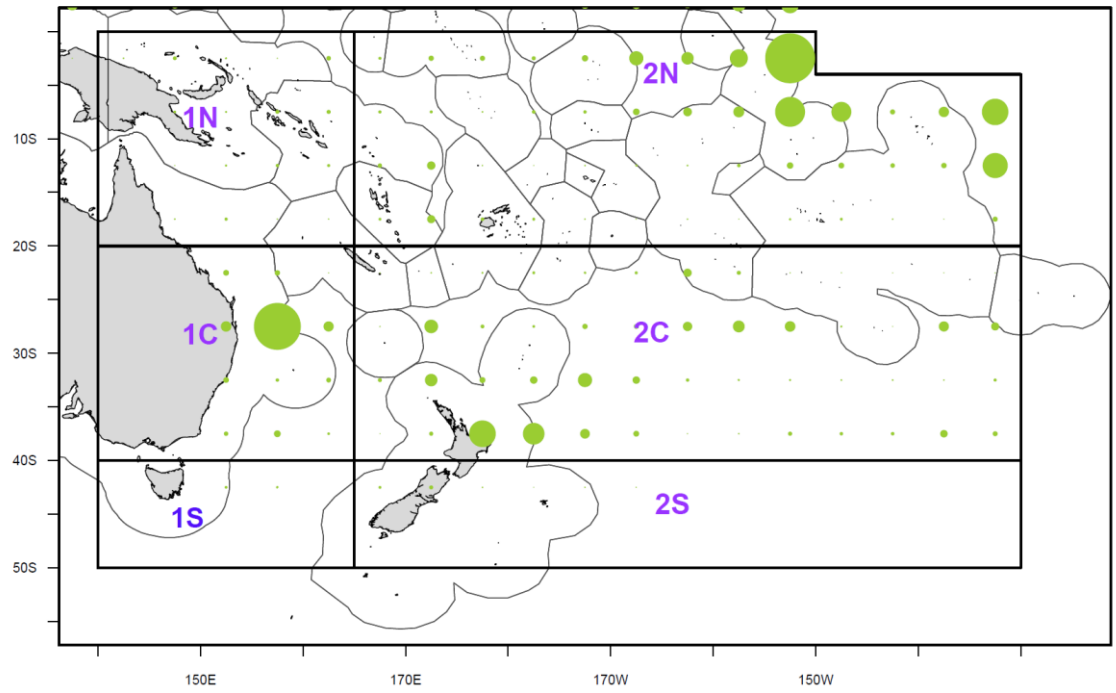

Figure 21. Swordfish. Catches of swordfish (numbers) in the southwest Pacific, 2006–2015. Source: raised catch estimates available from the SPC. The black lines represent the boundaries of the assessment regions 1 and 2 (outer lines) for swordfish in the southwest Pacific Ocean, and the six fishery sub-areas within those regions (from Takeuchi et al. 2017).

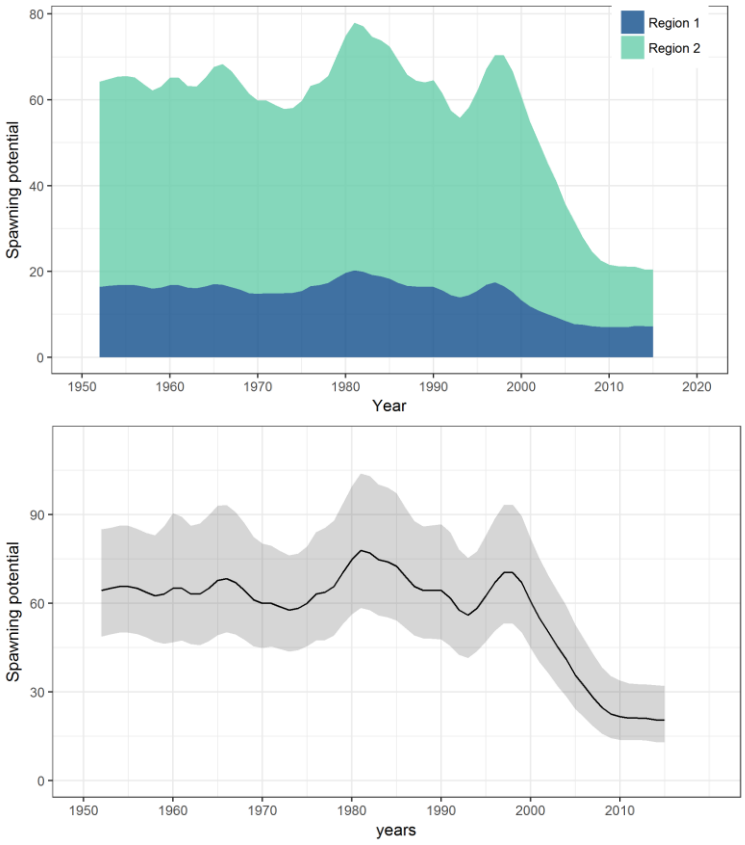

Figure 22. Swordfish. Estimated annual average spawning potential by year for the diagnostic case model, top: by model region, showing the relative sizes among regions; bottom: by year (black line) with 95% asymptotic confidence limits (shaded area) (from WCPFC-SC 2017).

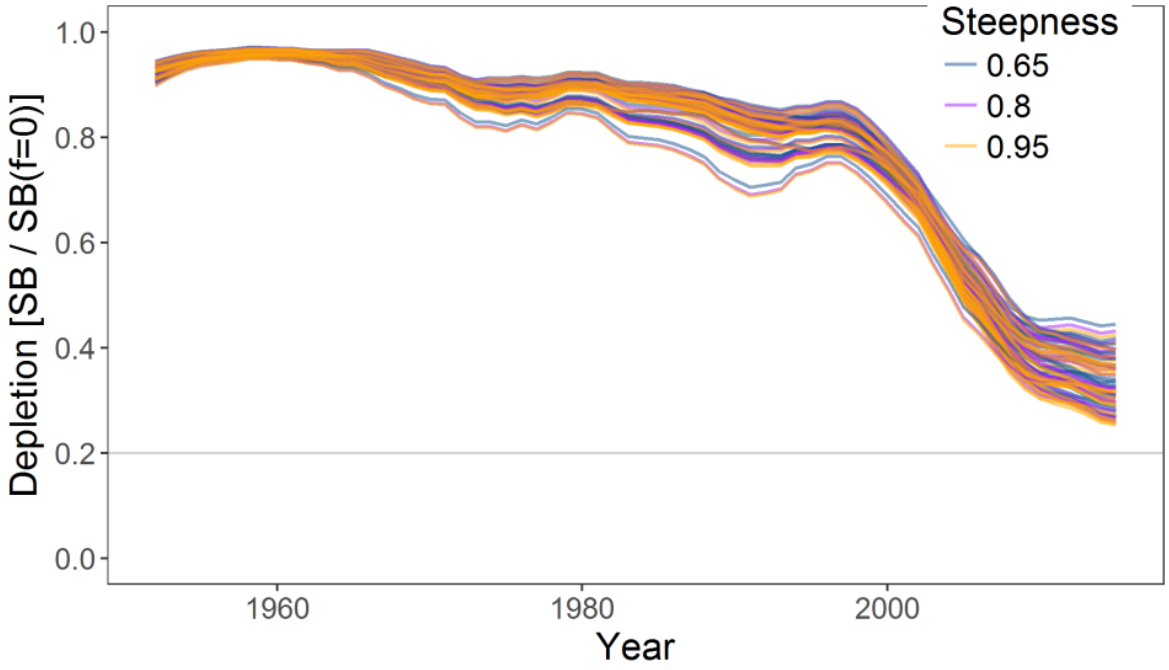

Figure 23. Swordfish. Trajectories of fishing depletion (of spawning potential) for the 72 model runs retained for the structural uncertainty grid used for management advice. The colours depict the models in the grid with three levels of steepness (0.65, 0.8 and 0.95) (from WCPFC-SC 2017).

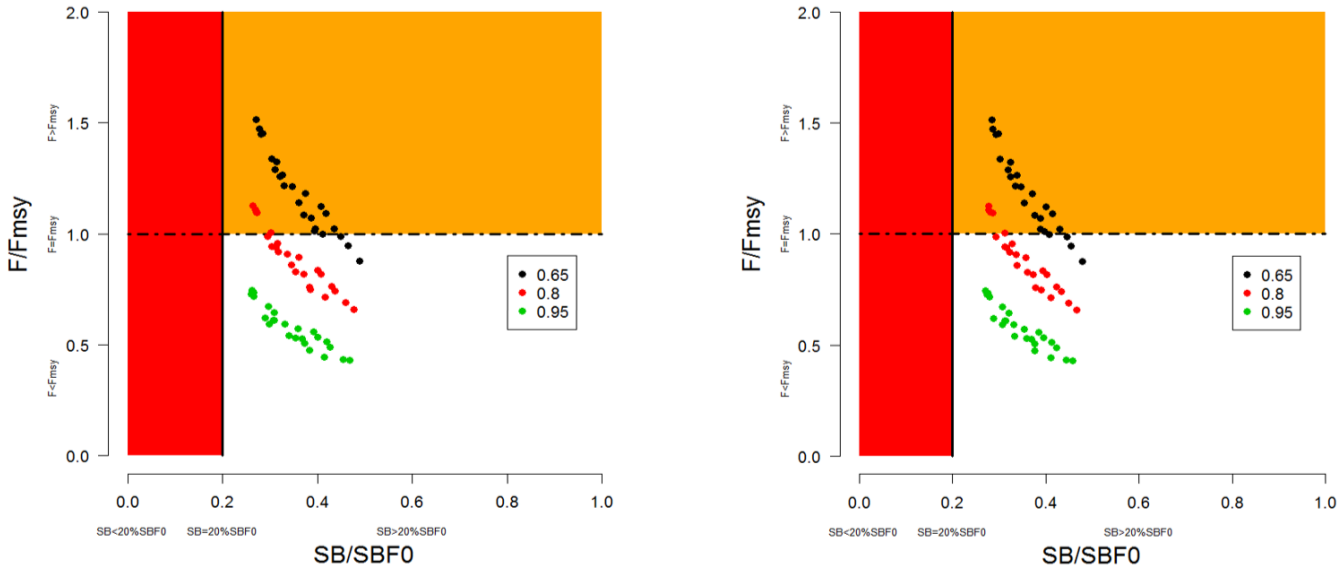

Figure 24. Swordfish. Majuro plot summarising the results for each of the models in the structural uncertainty grid retained for management advice. The plots represent estimates of stock status in terms of spawning potential depletion and fishing mortality. The red zone represents spawning potential levels lower than the agreed limit reference point which is marked with the solid black line. The orange region is for fishing mortality greater than F_{MSY} (F_{MSY} is marked with the black dashed line). The points represent Left: SB_{latest} /$SB_{F=0}$; Right: SB_{recent}/$SB_{F=0}$. The colours depict the models in the grid with three levels of steepness (0.65, 0.8 and 0.95) Note, SB_{recent} is defined as the mean of SB over 2012-2015 and SB_{latest} is the value for 2015. (from WCPFC-SC 2017).

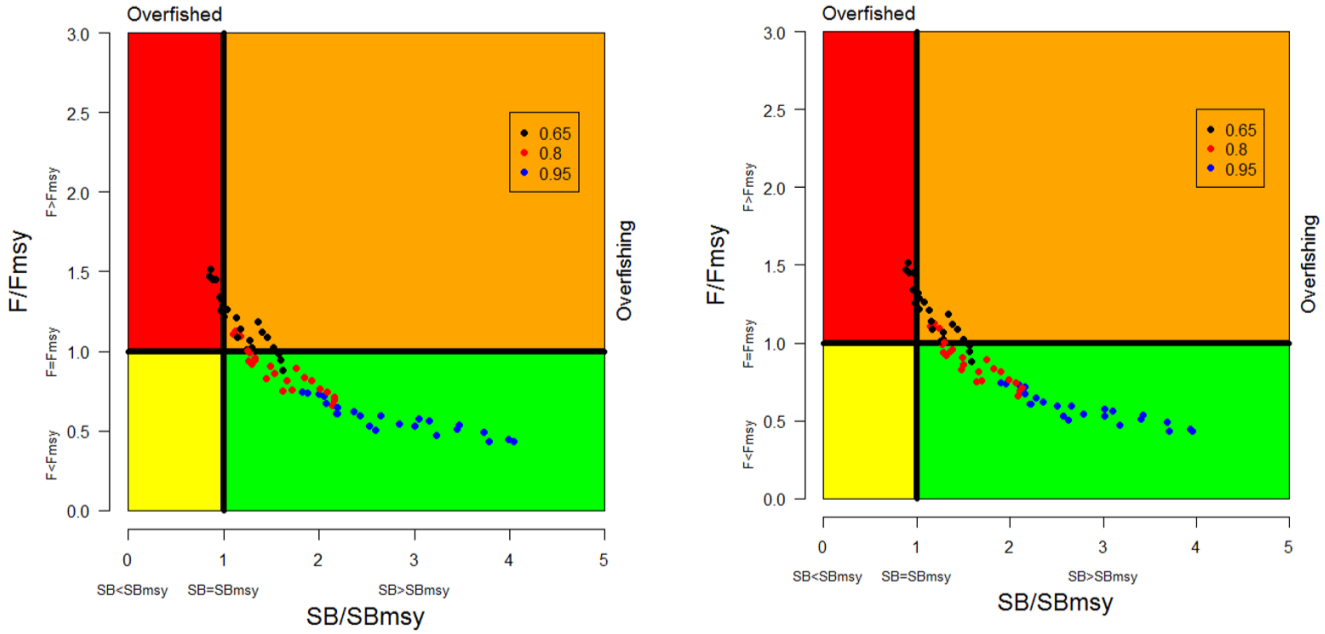

Figure 25. Swordfish. Kobe plot summarising the results for each of the models in the structural uncertainty grid, where the x-axis represents – Left: SB_{latest} /SB_{MSY}; Right: SB_{recent}/SB_{MSY}. The colours depict the models in the grid with three levels of steepness (0.65, 0.8 and 0.95). Note, SB_{recent} is defined as the mean of SB over 2012-2015 and SB_{latest} is the value for 2015. (from WCPFC-SC 2017).

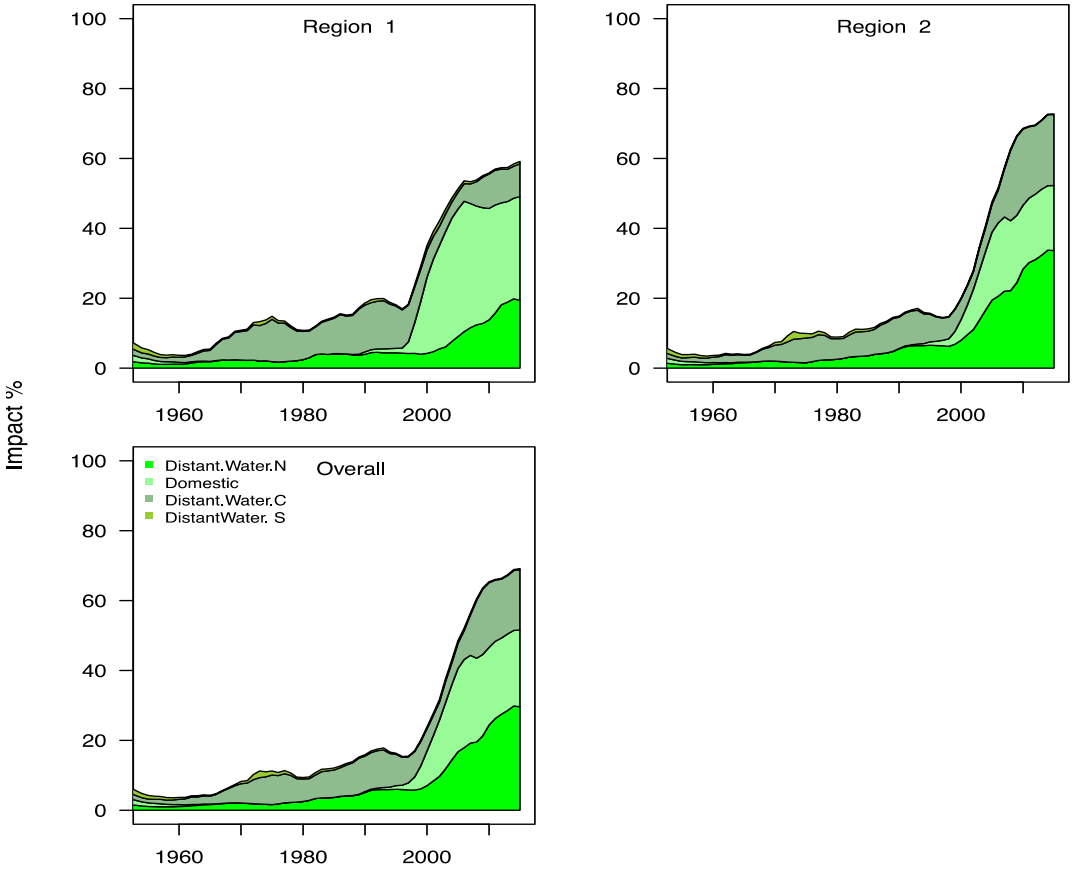

Figure 26. Swordfish. Estimates of reduction in spawning potential due to fishing by region, and over all regions (lower left panel), attributed to various fishery groups (distant water 'north', 'central' and 'south', corresponding to the model regions, and a combined domestic fleet) for the diagnostic case model (from WCPFC-SC 2017). Regions are shown in Figure 21.

Swordfish – Harvest strategy

The original MSC assessment (Gascoigne et al. 2015) considered that for swordfish, unlike the situation for albacore and yellowfin, the Australian management regime was more important than the regional WCPFC regime, but the WCPFC regime should also be considered. This reflects the greater proportion of the total catch of swordfish than of the tuna species that is taken in the ETBF. In that assessment the Australian Harvest Strategy for swordfish was the main basis for the assigned score for PIs 1.2.1 (which was scored at 80) and 1.2.2 (for which a condition was still imposed based on remaining deficiencies with the WCPFC harvest control rule).

However, in March 2018 AFMA's Tropical Tuna Resource Assessment Group (TTRAG) proposed, and the AFMA Commission subsequently agreed, to amend the ETBF Harvest Strategy for swordfish as the basis for setting its Total Allowable Commercial Catch (TACC) as, although it was achieving sustainability objectives, it was responding too slowly to achieve its other objective of maximising economic returns to industry. TTRAG agreed to move to an indicators-based approach similar to that used for albacore and yellowfin while a revised harvest strategy for the ETBF is being developed. This is expected to be in place in 2020. There remains no agreed WCPFC plan for the development of a Harvest Strategy for swordfish and CMM 2009-03 is still the effective management measure at the WCPFC level.

The TTRAG is the key research and scientific committee for management of the Eastern Tuna and Billfish Fishery and the Western Tuna and Billfish Fishery. The group provides advice to AFMA and the Tropical Tuna Management Advisory Committee

(https://www.afma.gov.au/fisheries/committees/tropical-tuna-management-advisory-committee-tropical-tuna-mac) on the status of fish stocks, sub stocks, species (target and non-target), the impact of fishing on the marine environment and the type of information needed for stock assessments. They also evaluate the impact over time of different harvest strategies, stock depletion and recovery rates, confidence levels for fishery assessments and risks to the success of fishery objectives. The TTRAG is made up of experienced stock assessment scientists, fisheries managers experts, a fisheries economist, and members of the fishing industry. Two scientific members of TTRAG, Dr Rob Campbell and Dr James Larcombe, also attend the scientific committee for WCPFC.

In implementing the new indicators-based approach, the TTRAG provided the following table as a summary of the main indicators (note figures referred to are from the SC report).

Indicator	**Comment**
Stock structure	The results of genetic studies support a separate south-western Pacific stock of Broadbill Swordfish. TTRAG therefore considered that Broadbill Swordfish is a single stock within the south-west Pacific. Over the past 5 years (2013-2017) the ETBF catch as a proportion of the total catch in the WCPFC Statistical Area south of the equator has averaged 11%.
WCPO Stock Assessment – Stock wide status	Last assessment: 2017 Overfished: Highly Unlikely Overfishing: Unlikely TTRAG noted that the last stock assessment for south-west Pacific Broadbill Swordfish was undertaken in 2017 and reviewed by the WCPFC Scientific Committee meeting (SC13) held in August 2017. The assessment incorporated data to the end of 2015. The stock assessment was based on a structural uncertainty grid comprising 72 models. The major uncertainty related to growth and maturity noted in the previous assessment has now been resolved due to the results of new research which were presented to and endorsed by SC12. SC13 considered all options within the four axes of uncertainty for steepness, size data, diffusion rate and natural mortality to be equally likely and the resulting uncertainty grid was used to characterize stock status. SC13 noted that the central tendency of relative recent spawning biomass was ($SB_{recent}/SB_{F=0}$) = 0.35 with a probable range of 0.29 to 0.43 (80% probability interval). The central tendency of relative recent fishing mortality was (F_{recent}/F_{MSY}) = 0.86 with an 80% probability interval of 0.51 to 1.23. While this suggested that there was likely a buffer between recent fishing mortality and F_{MSY} it also showed that there was some probability that recent fishing mortality was above F_{MSY}. SC13 noted that there was a roughly 32% probability (23 out of 72 models) that the recent fishing mortality was above F_{MSY}. Fishing mortality rate increased notably from the mid-1990s in both model regions, on maturing aged (4-6) fish in particular. Across all models in the uncertainty grid the spawning biomass declines steeply between the late 1990s and 2010 but since then the rate of decline has been less. Those declines are found in both model regions but are higher in the eastern Region 2 (equator to 50°S, 165°E to 130°W). TTRAG noted that the present assessment includes large catches taken in the north-eastern corner of the assessment region which may not be part of the stock in the southwest Pacific. Exclusion of these catches (which are around 50% of the total Region 2 catch over the past decade) is likely to lead to more optimistic assessment outcomes. TTRAG also noted that the results of the assessment excluding the northern areas have recently been provided to CSIRO. TTRAG has requested that the results based on these assessment runs be made available to TTMAC and the Commission.

	Next assessment: 2022	
WCPO Stock Assessment – Regional Assessment Indicators	Region 1 fishing mortality trends depend strongly on the diffusion rate scenario. For the zero-diffusion rate scenario the fishing mortality (F/F_{MSY}) showed a gradual increase from the 1960s and was highest in the late 1990s/early 2000s. During the last decade (2005-2015) fishing mortality has decreased to around half of these previous high levels. For the 11% diffusion rate scenario, the fishing mortality multiplier shows a similar gradual increase from the 1960s to the mid-1990s but then shows a dramatic increase for the 1995-2005 period. It then decreases by around 25% for the 2005-2015 decade (c.f. Figure SWO-3). Across the uncertainty grid of all 72 models, the median spawning biomass relative to unfished levels ($SB/SB_{F=0}$) in 2015 was 35% across both Regions. Assuming either zero, 11% or 25% diffusion rate between Regions 1 and 2, the median values of $SB/SB_{F=0}$ in 2015 were 42%, 32% or 31% respectively. TTRAG deemed the high diffusion rate scenario to be highly unlikely based on observations from tagging studies. An estimate of swordfish movement rates between the two regions of the current model was developed by Evans et al. (2012). They estimated diffusive mixing across the boundary at 165°E (diffusion rate, D = 0.11) as the best estimate of movement between regions at this time.	
Indicator	**10-year trend**	**Comment**
Region 1 catch	Variable, but recently stable	Between 2008 and 2017, minimum catch was 1,418t (2016), maximum catch was 1,880t (2012) and average catch was 1,590t (c.f. Figure SWO-1a). TTRAG noted the recent increase in catches taken by the EU adjacent to Region 1 (i.e. in the Tasman Region defined earlier) (c.f. Figure SWO-1b).
ETBF Proportion of Region 1 Catch	Decline then increase	The proportion of the ETBF catch in Region 1 declined from around 80% in 2008 to a low of around 50% in 2011. Since then it has steadily increased, reaching around 70% in 2016-17.
Region 1 spawning biomass	Decline	The major influencing factor on depletion of spawning biomass (both total and regional) is the rate of diffusion between Regions 1 and 2. Steepness of the stock-recruitment relation has little influence (whereas it strongly influences the F_{MSY} ratios). For zero, 11% and 25% diffusion rates the median spawning biomass relative to level in the absence of fishing ($SB/SB_{F=0}$) in Region 1 in 2015 is estimated to be around 62%, 41% and 37% respectively.
ETBF Catch	Stable around an average of 1151t	Since the introduction of quotas in 2011, quota year catches have fluctuated between years but averaged 1,151t between 2011 and 2017, varying over a range of 1,064t (2012) to 1,230t (2015) (c.f. Figure SWO 2a).
ETBF Standardised CPUE	Declining for recruits; stable then decline for sub-adults; stable for adults.	During 2017 the CPUE of recruits (age 1&2 fish) was 28% below the mean over the 10 year period (2008-17), CPUE of sub-adults (age 3&4 fish) was 21% below, while CPUE of adults (age 5+ fish) was similar to the previous 10 year average. (c.f. Figure SWO-2b)
ETBF Weights	Stable then increasing	The mean and upper 95th percentiles of the processed weight distribution show an increasing trend since about 2012/13.
State Catches	Negligible	Negligible based on advice from industry members
Recreational Catches	Very small	A small recreational fishery targeting adult fish (less than 100 fish per year) has recently developed off eastern Tasmania and has expanded to Victoria and NSW.

Status of stock in relation to the CHSP		Noting that the CHSP advocates a proxy target reference point of spawning biomass depletion ($SB/SB_{F=0}$) of 48%, the 2017 SWO assessment indicates that for zero, 11% and 25% diffusion rates the median depletion in Region 1 in 2015 is estimated to be around 62%, 41% and 37% respectively. Again, TTRAG deemed the high diffusion rate scenario to be highly unlikely based on observations from tagging studies.

In framing its advice to the AFMA Commission the TTRAG also provided the following comments.

"TTRAG have considered the above indicators and information in the context of any future TACC decisions for ETBF swordfish (made by the AFMA Commission), and noted the following

- *Increasing the TACC – If the TACC is fully utilised, increased catches in the ETBF under the zero-diffusion rate scenario are likely to reduce the level of spawning biomass in Region 1 (currently 62% $SB_{F=0}$) over time. Under the 11% diffusion rate scenario, increased catches in the ETBF are likely to reduce the level of spawning biomass in Region 1 below the current level of 41% $SB_{F=0}$.*
- *Maintaining the TACC - If the TACC is fully utilised, maintenance of present catch levels in the ETBF under the zero-diffusion rate scenario are likely to maintain the level of spawning biomass in Region 1 at its current level (62% $SB_{F=0}$). Under the 11% diffusion rate scenario, maintenance of present catch levels in the ETBF are likely to maintain the level of spawning biomass in Region 1 at the current level of 41% $SB_{F=0}$.*
- *Reducing the TACC - If the TACC is fully utilised, reduction of present catch levels in the ETBF under the zero-diffusion rate scenario are likely to increase the level of spawning biomass in Region 1 from its current level (62% $SB_{F=0}$). Under the 11% diffusion rate scenario, reduction of present catch levels in the ETBF are likely to increase the level of spawning biomass in Region 1 to above the current level of 41% $SB_{F=0}$.*

In considering the above scenarios, TTRAG noted that the degree to which the above responses in the stock occur will be dependent on several factors including:

- *Diffusion rate,*
- *The level of TACC change, and*
- *The timeframe over which these changes occur.*

While the level of diffusion rate remains uncertain, TTRAG noted that past analyses indicate the rate is around 11% based on the analysis of pop-up tags. TTRAG also noted that the bulk of tags released in Region 1 moved north-south."

These comments represent some advice about the implications of the different options (between increasing or decreasing the TACC) but do not contain a clear preference for any particular one.

The TACC for 2019 was set by the AFMA Commission at 1,250 t, which represented a 93 t increase on that for 2018 (implemented as a 960 t TACC for a reduced 10 month season but equivalent to 1,157 t for a 12 month TACC). We have not seen the basis for the AFMA Commission decision to increase the TACC for swordfish but evidence indicates that there is no longer a well-defined HCR in place for swordfish for the Australian component of the fishery. Nevertheless, given the types of indicators considered by the TTRAG and presented to the Commission we consider that a generally understood HCR remains in place that would act to reduce the TACC should the suite of indicators suggest the need to do so. Consideration is also being given to the reinstatement of the previous harvest strategy until the new one is developed.

The overall harvest strategy for the UoA remains a combination of the measures applied by Australia and the WCPFC. At the WCPFC level harvest strategies for the main tuna species are considered to be deficient and require conditions but for swordfish the original assessment considered that CMM 2009-03 constituted the harvest strategy. We do not consider that this CMM contains sufficient measures to

show how all the elements needed of a harvest strategy under MSC definitions are present and work together to achieve agreed objectives for the stock. The situation of swordfish was also assessed as being different from the tunas in that there was considered to be a harvest strategy in place for the Australian component of the fishery which had sufficient leverage over total mortality of the stock to be an effective stock conservation measure. The Australian fleet remains under a management process that, although not required under WCPFC measures, is consistent with the Australian Harvest Strategy Policy and produces a conservative TACC. Nevertheless, given that the previous harvest strategy has been set aside and an indicators-based approach has been adopted with no explicit harvest control rule, we consider that the harvest strategy for the swordfish fishery is now no more explicit than for the main WCPF tuna species, which have conditions for the harvest strategy performance indicators. There is also ongoing uncertainty about the extent of mixing between the stock components fished by the Australian fleet and those found elsewhere in the South Pacific, and therefore about the amount the leverage exerted by the Australian management system over the stock as a whole.

7.2.2 Total Allowable Catch (TAC) and catch data

Table 15 – Total Allowable Catch (TAC) and catch data Albacore Tuna				
TAC	Year	**2018***	Amount	**2,351 t**
UoA share of TAC	Year	**2018**	Amount	**2,351 t**
UoA share of total TAC	Year	**2018**	Amount	**2351 t**
Total green weight catch by UoC	Year (most recent)	**2018**	Amount	**889 t**
Total green weight catch by UoC	Year (second most recent)	**2017**	Amount	**992 t**

Table 16 – Total Allowable Catch (TAC) and catch data Yellowfin Tuna				
TAC	Year	**2018***	Amount	**2,054 t**
UoA share of TAC	Year	**2018**	Amount	**2,054 t**
UoA share of total TAC	Year	**2018**	Amount	**2,054 t**
Total green weight catch by UoC	Year (most recent)	**2018**	Amount	**1,517 t**
Total green weight catch by UoC	Year (second most recent)	**2017**	Amount	**1,714 t**

Table 17 – Total Allowable Catch (TAC) and catch data Bigeye Tuna				
TAC	Year	**2018***	Amount	**957 t**
UoA share of TAC	Year	**2018**	Amount	**957 t**
UoA share of total TAC	Year	**2018**	Amount	**957 t**
Total green weight catch by UoC	Year (most recent)	**2018**	Amount	**367 t**

Total green weight catch by UoC	Year (second most recent)	**2017**	Amount	**450 t**

Table 18 – Total Allowable Catch (TAC) and catch data Swordfish				
TAC	Year	**2018***	Amount	**960 t**
UoA share of TAC	Year	**2018**	Amount	**960 t**
UoA share of total TAC	Year	**2018**	Amount	**960 t**
Total green weight catch by UoC	Year (most recent)	**2018**	Amount	**1,027 t**
Total green weight catch by UoC	Year (second most recent)	**2017**	Amount	**1,180 t**

* In 2018 the fishing season ran for 10 months as a transition to a calendar year. The reported catch data are for a full 12 months.

7.2.3 Principle 1 Performance Indicator scores and rationales

PI 1.1.1 – Yellowfin: Stock status

Scores for P1 have been adopted following harmonization discussions among CABs as outlined in Section 8.7. Harvest Strategy condition timelines reflect those from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021.

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guide post	It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

This is the agreed harmonized score.

The diagnostic case from the 2017 stock assessment (Tremblay-Boyer et al. 2017) estimated that the spawning biomass was at 40% of unfished levels in 2015 and was well above the WCPFC limit reference point, 20%$SB_{F=0}$. Recruitment was also estimated to have been stable since the mid 1960s. The assessment considers both statistical uncertainty in the 'diagnostic case' and structural and data uncertainty across an uncertainty grid. As recommended by the assessment scientists, the SC has adopted the latter approach in framing its management advice and we have also accepted this approach for evaluating stock status here.

In the analysis of model structural uncertainty in the assessment (Tremblay-Boyer et al. 2017), using a crosswise grid of 72 alternative model formulations, only two runs (<5%) fell below the limit reference point. Nevertheless, in the selection of 48 of the 72 runs that were selected by the SC as the basis for its advice (Table 8) the lower 10 percentiles for $SB_{latest}/SB_{F=0}$ and $SB_{recent}/SB_{F=0}$ were 0.22 and 0.20 respectively, indicating that the stock was close to the point at which there would no longer be a high degree of certainty (95% probability) that it was still above the LRP of 20% $SB_{F=0}$ and will probably reach it soon if the stock continues to decline.

Previous modelling had also indicated that a biomass of this level for yellowfin tuna had a greater than 95% likelihood of being above the limit reference point of 20% of unfished levels (SPC-OFP 2014). A stock above this limit reference point is considered to be above the point where recruitment would be impaired.

Furthermore, Pilling et al. (2014) used stochastic projections under status quo conditions to estimate that it was exceptionally unlikely (<1%) that the yellowfin stock would fall below the limit reference point level or that fishing mortality would increase above the F_{MSY} level by 2032, and dependent upon the future recruitment assumption, it was exceptionally unlikely (<1%; long-term recruitment deviate assumption) or very unlikely (<10%; recent recruitment assumption) to fall below B_{MSY}.
There is, therefore, a high degree of certainty that the stock is above the point where recruitment would be impaired, which meets the requirements of scoring issue a at the SG 60, SG 80 and SG 100 levels.

b	Stock status in relation to achievement of Maximum Sustainable Yield (MSY)

	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is **a high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		**Yes**	**No**

Rationale

This is the agreed harmonized score.

There is no explicit target reference point for yellowfin tuna but there is considered to be an implicit target of B_{MSY} (supported by CMM 2016-01).

The grid medians for both SB_{recent}/SBMSY and SB_{latest}/SB_{MSY} in the most recent assessment were 1.42 (Tremblay-Boyer et al. 2017) which is well above this (default) target reference point and, given the estimated stock trajectory, would have done so over the whole period modelled.

This meets the requirements of scoring issue b at the SG 80 level.

Following SA2.2.1.3 a high degree of certainty means greater than or equal to the 95th percentile of a distribution. This assessment (unlike the previous one) does not provide 95% confidence intervals for the ratios SB_{recent}/SB_{MSY} and SB_{latest}/SB_{MSY} but across the grid of uncertainties only two runs (<5%) fell below the chance of the stock being below SB_{MSY} over recent years. This finding might suggest that that yellowfin tuna now meets the requirements of scoring issue b at the SG 100 level.

Nevertheless, previous assessment scores for Yellowfin tuna, based on the 2014 stock assessment (Davies et al. 2014), were that the SG 100 level was not met because the lower 95% confidence intervals for B/B_{MSY} was less than 1 and the upper 95% confidence interval for F/F_{MSY} was greater than 1. The 2017 assessment was slightly more optimistic but as the stock has recently been estimated to have been below that threshold, the SG 100 requirement that stock be above MSY over recent years is still not met.

References

Davies, N., Harley, S., Hampton, J., and McKechnie, S. (2014). Stock assessment of yellowfin tuna in the Western and Central Pacific Ocean. WCPFC-SC10-2014/SA-WP-04, Majuro, Republic of the Marshall Islands, 6–14 August 2014. https://www.wcpfc.int/node/18997

Pilling et al. 2014. Evaluation of risks of exceeding limit reference points for south Pacific albacore, bigeye, yellowfin and skipjack tunas with implications for target reference points: a case study using south Pacific albacore. https://www.wcpfc.int/node/18513

SPC-OFP 2014. Consideration of acceptable levels of risk of exceeding Limit Reference Points for the four main tuna stocks: uncertainty and implications for Target Reference Points and Harvest Control Rules. MOW3-WP/02. https://www.wcpfc.int/node/20056

Tremblay-Boyer, L., McKechnie, S., Pilling, G., and Hampton, J. (2017). Stock assessment of yellowfin tuna in the Western and Central Pacific Ocean. WCPFC-SC13-2017/SA-WP-06, Rarotonga, Cook Islands, 9-17 August 2017. https://www.wcpfc.int/node/29519

Stock status relative to reference points

	Type of reference point	Value of reference point	Current stock status relative to reference point

Reference point used in scoring stock relative to PRI (SIa)	Level of spawning biomass in the absence of fishing ($SB_{F=0}$) LRP: 20% $SB_{F=0}$	$SB_{F=0}$ = 2,592,702 t 0.2 X $SB_{F=0}$ = 518,540 t	$SB_{latest}/SB_{F=0}$ = 0.46 > LRP $SB_{recent}/SB_{F=0}$ = 0.42 > LRP
Reference point used in scoring stock relative to MSY (SIb)	Level of spawning biomass relative to MSY (SB_{MSY})	SB_{MSY}=750,100 t	SB_{latest}/SB_{MSY} = 1.58 SB_{recent}/SB_{MSY} = 1.46
Overall Performance Indicator score		**90**	

PI 1.1.2 – Yellowfin: Stock rebuilding – Not applicable

PI 1.1.2		**Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe**		
Scoring Issue		SG 60	SG 80	SG 100
a	Rebuilding timeframes			
	Guide post	A rebuilding timeframe is specified for the stock that is the **shorter of 20 years or 2 times its generation time**. For cases where 2 generations are less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock.
	Met?	**N/A**		**N/A**
Rationale				

The stock does not require rebuilding

b	Rebuilding evaluation			
	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is **evidence** that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.	There is **strong evidence** that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.
	Met?	**N/A**	**N/A**	**N/A**
Rationale				

The stock does not require rebuilding

References

Overall Performance Indicator score	**N/A**

PI 1.2.1 – Yellowfin: Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guide post	The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	**Yes**	**No**	**Not scored**
Rationale				

This is the agreed harmonized score.

MSC defines a harvest strategy as 'the combination of monitoring, stock assessment, harvest control rules and management actions, which may include an MP or an MP (implicit) and be tested by MSE' (MSC – MSCI Vocabulary v1.1).

The harvest strategy for WCPO yellowfin has several contributing components, with WCPFC, PNA and national and archipelagic waters management actions being supported by a robust stock assessment and extensive monitoring frameworks. There are, however, no formal harvest control rules. This conclusion is consistent with the results of extensive harmonisation discussions among CABs as described in more detail in Section 8.7.

The range of measures applied to the sectors that fish for yellowfin tuna are expected to achieve stock management objectives meeting the requirements of the SG 60 level.

Nevertheless, the general stock decline for yellowfin (albeit with a recent increase in stock size), the absence of agreed harvest control rules within WCPFC or PNA for any other tuna species, and the record of the Commission failing to reduce fishing mortality on bigeye tuna when it was thought to have been subject to overfishing, reduces the level of confidence that the harvest strategy would be responsive to the state of the stock or that the elements will work together when required to do so to achieve the management objectives.

It is also not clear that coherent management actions are implemented throughout the range of the stock, particularly in Indonesia and the Philippines.
Overall this prevents the conclusion that the strategy is designed to achieve stock management objectives.
Yellowfin tuna is therefore considered to meet the SG 60 level of this scoring issue but not the SG 80 or SG 100 levels.

b	Harvest strategy evaluation			
	Guide post	The harvest strategy is **likely** to work based on prior experience or plausible argument.	The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.

	Met?	**Yes**	**Yes**	**Not scored**
Rationale				

This is the agreed harmonized score.

Yellowfin tuna have been estimated to be above default target levels and the status quo stock projections undertaken indicate that "it was exceptionally unlikely (<1%) that the yellowfin stock would fall below the limit reference point level or that fishing mortality would increase above the FMSY level by 2032" (Pilling et al. 2014).
Furthermore, the most recent stock assessment (Tremblay-Boyer et al. 2017) indicates that fishing mortality for yellowfin tuna has always been below the F_{MSY} level and that the stock has not declined below the default target of B_{MSY}. This constitutes good evidence that the harvest strategy is meeting its objectives.
Therefore, yellowfin tuna is considered to meet both the SG 60 and SG 80 levels of this scoring issue

c	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	**Yes**		
Rationale				

This is the agreed harmonized score.

Monitoring in place for the longline fishery for yellowfin tuna include mandatory logbooks with records of catch and effort for each fishing operation, a VMS, tagging data, biological studies and port inspections. There is, however, only very limited observer coverage of fishing operations so there are relatively few data on the discarded component of the catch, but few yellowfin would be expected to be discarded. The data that are collected do support a sophisticated stock assessment process that provides robust estimates of stock status that is sufficient to determine whether the harvest strategy is working. This meets the SG 60 requirements.

d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			**Not scored**
Rationale				

Not scored because at least one other scoring issue does not reach the SG80 level.

e	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**Not scored**	**Not scored**	**Not scored**
Rationale				

Not scored as sharks are not a target species.

	Review of alternative measures			
f	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	**N/A**	**N/A**	**Not scored**

Rationale

This is the agreed harmonized score. There is negligible unwanted catch of the target stock.

References

Pilling et al. 2014. Evaluation of risks of exceeding limit reference points for south Pacific albacore, bigeye, yellowfin and skipjack tunas with implications for target reference points: a case study using south Pacific albacore. https://www.wcpfc.int/node/18513

Tremblay-Boyer, L., McKechnie, S., Pilling, G., and Hampton, J. (2017). Stock assessment of yellowfin tuna in the Western and Central Pacific Ocean. WCPFC-SC13-2017/SA-WP-06, Rarotonga, Cook Islands, 9-17 August 2017. https://www.wcpfc.int/node/29519

Overall Performance Indicator score	**70**
Condition number (if relevant)	1. By the third surveillance audit, demonstrate that the harvest strategy for yellowfin tuna is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80 Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.

PI 1.2.2 – Yellowfin: Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	**Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	**Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time.
	Met?	**Yes**	**No**	**Not scored**
Rationale				

This is the agreed harmonized score.

Not even a generally understood HCR is considered to be in place but one is considered to be available (following guidance in SA2.5.2, SA2.5.3 and SA2.5.5) on the basis that the stock has never been depleted below B_{MSY} and there is an agreement in place that requires the WCPFC to adopt HCRs before the stock declines below B_{MSY}.

b	HCRs robustness to uncertainty			
	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.
	Met?		**No**	**Not scored**
Rationale				

This is the agreed harmonized score.

There is no HCR in place so it cannot be said that it is robust to the main uncertainties.

c	HCRs evaluation			
	Guide post	There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation.	**Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.

	Met?	Yes	No	Not scored
Rationale				

This is the agreed harmonized score.

The results of the most recent assessment are taken as indicating that tools used or available to implement HCRs are effective at controlling exploitation.

The HCRs are only regarded as being 'available' in scoring issue (a) and not 'in place', so it is considered that it is not possible to score more than 60 for issue (c) since the SG 80 refers to the tools 'in use' in the fishery and not the tools 'in use or available'.

References

Overall Performance Indicator score	**60**
Condition number (if relevant)	2. SI a) By the third surveillance audit, demonstrate that well defined HCRs are in place for yellowfin tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. SI b) By the third surveillance audit, provide evidence that the selection of the harvest control rules for yellowfin tuna are robust to the main uncertainties. SI c) By the third surveillance audit, provide evidence that indicates that the tools in use for yellowfin tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.

PI 1.2.3 – Yellowfin: Information and monitoring

PI 1.2.3	**Relevant information is collected to support the harvest strategy**		
Scoring Issue	SG 60	SG 80	SG 100
a	Range of information		

	Guide post	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	**Yes**	**Yes**	**No**
Rationale				

This is the agreed harmonized score.

The range and comprehensiveness of the data available is considered sufficient to meet SG60 and SG80 requirements. Nonetheless, there are some data gaps, bias and lack of precision in some of the data sets, and the stock assessment continues to rely on commercial CPUE as an index of stock abundance. Although these data are carefully analysed and standardised as far as possible, there are no fishery-independent data sets with which they can be compared, while issues such as spatial and temporal changes in catchability remain problematic. The SG60 and SG 80 are considered to be met, but not the SG 100.

b	Monitoring			
	Guide post	Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	**Yes**	**Yes**	**No**
Rationale				

This is the agreed harmonized score.

Stock abundance and removals are monitored at a level of accuracy and coverage that is sufficient to support the harvest control measures in place.
There is not, however, a high degree of certainty about all the information required.
There is not considered to be a high degree of certainty about stock abundance or the robustness of the assessment to this uncertainty.

This meets the requirements for the SG 60 and SG 80 levels but not the SG 100 level.

c	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		**Yes**	
Rationale				

This is the agreed harmonized score.

There is now good information on all other fishery removals for yellowfin tuna whereas previously there were gaps concerning the catch by some coastal fisheries.
This meets the requirements of the SG 80 level

References

Overall Performance Indicator score	**80**

PI 1.2.4 – Yellowfin: Assessment of stock status

PI 1.2.4		**There is an adequate assessment of the stock status**		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		**Yes**	**Yes**
Rationale				

This is the agreed harmonized score.

The most recent assessment applied to yellowfin tuna (Tremblay-Boyer et al. 2017), like other recent assessments, is an integrated, model-based assessment that is undertaken by an experienced and internationally recognised stock assessment program at the SPC. It takes into account major features relevant to the biology and the nature of the fishery.
It therefore meets the requirements of the SG 80 and SG 100 levels of this scoring issue.

b	Assessment approach			
	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	**Yes**	**Yes**	
Rationale				

This is the agreed harmonized score.

The assessment reports provide a wide range of estimates of stock status relative to indicators of interest to management including both the target and limit reference points that have been agreed for yellowfin tuna.

This therefore meets the requirements of the SG 60 and SG 80 levels

c	Uncertainty in the assessment			
	Guide post	The assessment **identifies major sources** of uncertainty.	The assessment **takes uncertainty into account**.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

This is the agreed harmonized score.

The assessment of yellowfin tuna has provided explicit commentary on the major sources of uncertainty, has assessed the sensitivity of the assessment to these uncertainties, and has evaluated current and future stock status relative to these in a probabilistic way. Two approaches were used to describe the uncertainty in key model outputs. The first estimated the statistical uncertainty within a given assessment model, while the second focused on the structural uncertainty in the assessment by considering the variation among a suite of models that encompassed combinations of alternative parameter values from 5 axes: steepness (3 settings), tagging data overdispersion (2), tag mixing (2), size data weighting (3) and regional structure (2). Greater emphasis was placed on the results of the latter approach for the formulation of management advice.

This meets the requirements of the SG 60, SG 80 and SG 100 levels of this scoring issue

d	Evaluation of assessment			
	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			**Yes**
Rationale				

This is the agreed harmonized score.

There is an ongoing program of review of assessment assumptions and approaches by the staff in the SPC-OFP. Alternative hypotheses are continually being explored (within funding and time constraints) and assessments are updated and modified as required.
Model structure has been updated to reflect the availability of new data or new interpretations of existing data and a suite of sensitivity analyses have been undertaken to explore the impact of options such as changing assumptions for fixed parameters or different treatments of the data. Furthermore, retrospective analyses have been undertaken to explore any systematic biases in the model and the results used to adjust the reference case.
The assessment for yellowfin tuna has been shown to be robust and therefore meets the requirements of this scoring issue.
We note that there has been no simulation testing of the model, but such testing is not necessary to meet the requirements.

e	Peer review of assessment			
	Guide post		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		**Yes**	**No**

Rationale

This is the agreed harmonized score.

Internal reviews are undertaken by SPC and there has been an external review of the assessment of Bigeye tuna (Ianelli et al. 2012) which provided recommendations that were also applicable to other similar assessments such as for yellowfin tuna. Many of those recommendations have been addressed with the latest yellowfin assessment.
There have also been external reviews commissioned of different aspects of the data analyses that feed into the assessments.
This is also a level of review provided by submission to the scientific committee of the WCPFC, at which experienced scientific staff from several countries attend, but we consider this to be internal to WCPFC processes.
There has been no external review of the assessment commissioned by the WCPFC.

Therefore, we consider that this scoring issue is met at the SG 80 level but not at the SG 100 level.

References

Ianelli, J., Maunder, M. N., and Punt, A. E. (2012). Independent review of the 2011 WCPO bigeye tuna assessment. WCPFC-SC8-2012/SA-WP-01, Busan, Republic of Korea, 7-15 August 2012. https://www.wcpfc.int/node/3131

Tremblay-Boyer, L., McKechnie, S., Pilling, G., and Hampton, J. (2017). Stock assessment of yellowfin tuna in the Western and Central Pacific Ocean. WCPFC-SC13-2017/SA-WP-06, Rarotonga, Cook Islands, 9-17 August 2017. https://www.wcpfc.int/node/29519

Overall Performance Indicator score	**95**
Condition number (if relevant)	

PI 1.1.1 – Albacore: Stock status

Scores for P1 have been adopted following harmonization discussions among CABs as outlined in Section 8.7. Harvest Strategy condition timelines reflect those from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021.

PI 1.1.1	**The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing**		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment		
	Guide post	It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

This is the agreed harmonized score.

The stock assessment was updated in 2018 (Tremblay-Boyer et al. 2018) but its findings have confirmed the conclusions of previous assessments: that there is no evidence of any impairment to recruitment for south Pacific albacore and no trend over time. All models indicated that South Pacific albacore was above the limit reference point (of $0.2SB_{F=0}$), with overall median depletion for 2016 ($SB_{latest}/SB_{F=0}$) estimated at 0.52 (80 percentile range 0.37-0.69). An analysis using SS3, presented to SC12 (Cao et al., 2016) confirmed the conclusions of the SPC assessment and estimated SB at ~55% of SB_0. Although confidence intervals that match the MSC definition of a high degree of certainty (the 95th percentile) were not available, the lower 90th percentile (0.37) is so far above the PRI that it is clear that this threshold is met.
The stock continues to meet the requirements of the SG 60, SG 80 and SG 100 levels.

Stock status in relation to achievement of Maximum Sustainable Yield (MSY)

b	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is **a high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		**Yes**	**Yes**

Rationale

This is the agreed harmonized score.
The updated assessment (Tremblay-Boyer et al 2018) has provided estimates of spawning biomass relative to MSY for recent and latest years. The Kobe plots are showing this also over the history of the fishery. SB_{MSY} was estimated to be at 0.15 $SB_{F=0}$ with the lower 10 percentile estimated to be 1.96 times this level. Although confidence intervals that match the MSC definition of a high degree of certainty (the 95th percentile) were not available, the lower 90th percentile is so far above the PRI that it is clear that this threshold is met. These showed that there continues to be a high degree of certainty that the stock has always been above a level that is consistent with MSY.
The stock continues to meet the requirements of the SG 80 and SG 100 levels.

References

Tremblay-Boyer L, J. Hampton, S. McKechnie and G. Pilling. (2018). Stock assessment of South Pacific albacore tuna. WCPFC-SC14-2018/ SA-WP-05. Rev. 2* (2 August 2018). https://www.wcpfc.int/node/31182

Stock status relative to reference points

	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	Level of spawning biomass in the absence of fishing ($SB_{F=0}$) LRP: 20% $SB_{F=0}$	$SB_{F=0}$ = 469,004 t 0.2 X $SB_{F=0}$ = 93,801t	$SB_{latest}/SB_{F=0}$ = 0.53 (> LRP) $SB_{recent}/SB_{F=0}$ = 0.51 (> LRP)
Reference point used in scoring stock relative to MSY (SIb)	Level of spawning biomass in the absence of fishing ($SB_{F=0}$) Interim TRP: 56% $SB_{F=0}$ Level of spawning biomass relative to MSY (SB_{MSY})	$SB_{F=0}$ = 469,004 t 0.56 X $SB_{F=0}$=262,642 t SB_{MSY}= 71,407 t	$SB_{latest}/SB_{F=0}$ = 0.53 (< Interim TRP) $SB_{recent}/SB_{F=0}$ = 0.51 (< Interim TRP) SB_{latest}/SB_{MSY} = 4 (>> SB_{MSY}) SB_{recent}/SB_{MSY} = 3.88 (>> SB_{MSY})

Overall Performance Indicator score	**100**

PI 1.1.2 – Albacore: Stock rebuilding – Not applicable

PI 1.1.2		**Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe**		
Scoring Issue		SG 60	SG 80	SG 100
a	Rebuilding timeframes			
	Guide post	A rebuilding timeframe is specified for the stock that is the **shorter of 20 years or 2 times its generation time**. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock.
	Met?	**N/A**		**N/A**
Rationale				

Not scored as the stock does not require rebuilding

b	Rebuilding evaluation			
	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is **evidence** that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.	There is **strong evidence** that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.
	Met?	**N/A**	**N/A**	**N/A**
Rationale				

Not scored as the stock does not require rebuilding

References

Overall Performance Indicator score	**N/A**

PI 1.2.1 – Albacore: Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guide post	The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	**Yes**	**No**	**Not scored**
Rationale				

This is the agreed harmonized score.

Agreed harmonized score: 60
MSC defines a harvest strategy as 'the combination of monitoring, stock assessment, harvest control rules and management actions, which may include an MP or an MP (implicit) and be tested by MSE' (MSC – MSCI Vocabulary v1.1).

WCPFC adopted a process for developing a formal harvest strategy for each of its key stocks, including South Pacific albacore, in CMM 2014-06, which has an associated workplan.

The harvest strategy for South Pacific albacore has several contributing components:

- Data collection on the stock and fishery (described in Section 3.3.2 and evaluated under PI 1.2.3 below)
- Stock assessment process (described in Section 3.3.2 and evaluated under PI 1.2.4 below)
- A limit reference point (explicit) and an interim target reference point (see PI 1.1.1 above)

Measures to control the fishery at WCPFC, PNA and Solomon Islands national levels that are in place (such as CMM 2018-01) or 'available' are described in Section 3.3.2 and these are evaluated below under PI 1.2.2.

Implementation of CMM 2015-02 is monitored via data gathering and Part 2 reports to the Commission.

These components of a harvest strategy as applied to south Pacific albacore are expected to achieve stock conservation management objectives meeting the requirements of the SG 60 level.

There are, however, no formal harvest control rules. This absence of agreed harvest control rules within WCPFC for any other tuna species, and the record of the Commission failing to reduce fishing mortality on bigeye tuna when it was thought to have been subject to overfishing, reduces the level of confidence that the harvest strategy would be responsive to the state of the stock or that the elements will work together when required to do so to achieve the management objectives.

It is also not clear that coherent management actions are implemented throughout the range of the stock, particularly in Indonesia and the Philippines. Overall this prevents the conclusion that the strategy is designed to achieve stock management objectives.

The harvest strategy for south Pacific albacore is therefore considered to meet the SG 60 level of this scoring issue but not the SG 80 or SG 100 levels.

b	Harvest strategy evaluation			
	Guide post	The harvest strategy is **likely** to work based on prior experience or plausible argument.	The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	**Yes**	**Yes**	**Not scored**
Rationale				

This is the agreed harmonized score.

As described under PI 1.1.1 above, albacore remain classified as not overfished nor subject to overfishing. The stock is about half of unfished levels and only slightly below the newly agreed TRP which is evidence that the strategy is achieving its objectives.

The harvest strategy, however, remains incompletely specified and has not fully been fully evaluated. This meets the requirements of the SG 60 and SG 80 levels but not of the SG 100 level.

c	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	**Yes**		
Rationale				

This is the agreed harmonized score.

Monitoring in place for the longline fishery for albacore tuna include mandatory logbooks with records of catch and effort for each fishing operation, a VMS, tagging data, biological studies and port inspections. There is, however, only very limited observer coverage of fishing operations so there are relatively few data on the discarded component of the catch, but few albacore would be expected to be discarded (Tremblay-Boyer et al. 2018). The data that are collected support a sophisticated stock assessment process that provides robust estimates of stock status that is sufficient to determine whether the harvest strategy is working.

This meets the requirements of the SG 60 level.

d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			**Not scored**
Rationale				

Not scored because at least one other scoring issue does not reach the SG80 level.

e	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**N/A**	**N/A**	**N/A**
Rationale				

Scoring Issue is not scored as sharks are not a target species.

f	Review of alternative measures			
	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	**N/A**	**N/A**	**N/A**
Rationale				

There is negligible unwanted catch of the target stock.

References

Tremblay-Boyer L, J. Hampton, S. McKechnie and G. Pilling. (2018). Stock assessment of South Pacific albacore tuna. WCPFC-SC14-2018/ SA-WP-05. Rev. 2* (2 August 2018). https://www.wcpfc.int/node/31182

Overall Performance Indicator score	70
Condition number (if relevant)	3. By the third surveillance audit, demonstrate that the harvest strategy for albacore tuna is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.

PI 1.2.2 – Albacore: Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	**Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	**Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time.
	Met?	**Yes**	**No**	**Not scored**
Rationale				

This is the agreed harmonized score.

A generally understood HCR is taken here to mean one that is not well defined, as otherwise there is no distinction between requirements at the SG 60 and SG 80 levels. This PI is also assessed taking account the guidance for scoring 'available' HCRs at SG 60 containing in SA2.5.2, SA2.5.3 and SA2.5.5.

The first option for scoring 'available' HCRs is intended to cover the situation where even generally understood HCRs are not yet clearly in place for a fishery. For WCPFC fisheries, including albacore tuna, there are measures for controlling fishing effort through closures, limits on fishing capacity and, for vessels involved, through limits on fishing days under the LL VDS. There are expectations about responses and examples of how actions have been implemented for species such as bigeye tuna, but there is no clear linkage or explicit process that links changes in stock status to emergent associated management actions. Therefore, we do not consider that there are even generally understood HCRs that are also "in place"; and the options for 'available' HCRs are evaluated below.

MSC CR v2.0 lays out two conditions for acceptance of HCR being available sufficient to justify scoring at the SG60 level.

First, CR v2.0 SA2.5.2a provides for HCR being recognized as available "...Stock biomass has not previously been reduced below the MSY level or has been maintained at that level for a recent period of time that is at least longer than 2 generation times of the species, and is not predicted to be reduced below BMSY within the next 5 years".

As noted at PI 1.1.1(c), The MULTIFAN-CL assessment provides probabilistic estimates of parameters of interest and has been extensively explored through sensitivity tests (Tremblay-Boyer et al. 2018). The stock assessment estimates spawning stock biomass to be well above SB_{MSY} (see PI 1.1.1 above). The stock is estimated never to have reduced to SB_{MSY} and has hence been above SB_{MSY} in all years. Stock projections reported in WCPFC-SC (2017) indicated that, under 2015 effort levels, the stock was predicted to decline but only gradually and would not fall below B_{MSY} levels within 5 years.
The CR v2.0 SA2.5.2a condition is therefore met.

Second, CR v2.0 SA2.5.3 requires that "Teams shall recognise 'available' HCRs as 'expected to reduce the exploitation rate as the point of recruitment impairment is approached' only in cases where,
a. HCRs are effectively used in some other UoAs, that are under the control of the same management body and of a similar size and scale as the UoA; or

b. An agreement or framework in place that requires the management body (in this case WCPFC) to adopt HCRs before the stock declines below B_{MSY}".
There are CMMs that are in place for a range of tuna species within the WCPFC (including albacore) that contain a range of management measures that are designed to constrain fishing mortality to acceptable levels. Nevertheless, none are considered to offer an example of effectiveness in reducing exploitation as the PRI is approached. Option a. is therefore not considered to be met.

Option b. examines plans for the introduction of an effective HCR. WCPFC CMM 2014-06 sets out definitions of harvest strategies to be developed and implemented. The definitions include target and limit reference points and decision rules or ("harvest control rules"), with a clear intention that harvest control rules, tested using simulation approaches, will be part of the implemented harvest strategies. The Commission agreed to adopt a work plan at the 2015 Commission meeting, with later revisions in subsequent years, with application to skipjack, bigeye, yellowfin, Pacific Bluefin, and South and North Pacific albacore tunas. In fact, work towards establishing reference points and harvest control rules has been initiated through the Management Objectives Workshop (MOW) process.

We note that there is no specific requirement in CMM 2014-06 linking implementation of the HCRs to stock projections. Nevertheless, given that albacore tuna are projected to remain well above B_{MSY} for many years and that the process CMM 2014-06 describes has already been initiated – considered in place - we have considered that the requirements of Option b. SA2.5.3b are met. The requirements of the SG 60 level are therefore considered to be met.

In summary, generally understood HCRs are not in place. Albacore is a stock that has not previously been reduced below MSY, which has always been maintained well above the TRP and has an improbably low likelihood of becoming overfished or to experience overfishing. Therefore, this stock meets the requirements to be considered against "availability" requirements. In the WCPF, HCRSs are not yet effectively used in any other WCPFC-managed UoAs. However, there is a framework that is in place, expected to develop further that will require the WCPFC to take action on HCRs before there is any detectable, projected risk that albacore stock status could decline below B_{MSY}.

b	HCRs robustness to uncertainty			
	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.
	Met?		**No**	**Not scored**
Rationale				

This is the agreed harmonized score.

The 'available' harvest control rules are not sufficiently articulated to allow an evaluation of the extent to which they are robust to the main uncertainties. When well-defined HCRs are developed, they can be evaluated as to whether this is the case.

The SG80 requirements are not considered to be met

c	HCRs evaluation			
	Guide post	There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation.	**Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.

	Met?	**Yes**	**No**	**Not scored**

Rationale

This is the agreed harmonized score.

As noted under scoring issue a above, following SA2.5.3b, we have recognised 'available' HCRs as 'expected to reduce the exploitation rate as the point of recruitment impairment is approached'.

SA2.5.5b, which requires that teams shall include in their rationale a description of the formal agreement or legal framework that the management body has defined, and the indicators and trigger levels that will require the development of HCRs.
The agreement is contained in CMM 2014-06 whose objective is "To agree that the Commission shall develop and implement a harvest strategy approach for each of the key fisheries or stocks under the purview of the Commission according to the process set out in this conservation and management measure."

This CMM contains general principles (including a description of a harvest strategy) and principles and elements of the proposed harvest strategies (which are consistent with the MSC definitions). The definitions include target and limit reference points and decision rules (or "harvest control rules"), with a clear intention that harvest control rules, tested using simulation approaches, will be part of the implemented harvest strategies. The specified timelines are that:
"The Commission shall agree a workplan and indicative timeframes to adopt or refine harvest strategies for skipjack, bigeye, yellowfin, South Pacific albacore, Pacific bluefin and northern albacore tuna by no later than the twelfth meeting of the Commission in 2015. This workplan will be subject to review in 2017."

Work towards establishing reference points and harvest control rules was initiated before this CMM was passed through the Management Objectives Workshop process and requires no additional trigger for their development.

The requirements of SA2.5.5b are therefore considered to be met.

Furthermore, SA2.5.6 requires that, in scoring issue (c) for "evidence" teams shall include consideration of the current levels of exploitation in the UoA, such as measured by the fishing mortality rate or harvest rate, where available.

The most recent stock assessment for albacore tuna (Tremblay-Boyer et al. 2018) and stock status projections provide some evidence that the tools in use are effective in controlling exploitation of albacore tuna and achieving the exploitation levels that are required. As noted above, these indicate that fishing mortality has always been below the F_{MSY} level, that the stock has not declined below B_{MSY} and that it is exceptionally unlikely (<1%) that fishing mortality will increase above the F_{MSY} level by 2032. The current levels of exploitation are therefore acceptable and the requirements of SA2.5.6 are met.
This meets the requirements of the SG 60 level.

The HCRs are only regarded as being 'available' in scoring issue (a) and not 'in place', so we have considered that it is not possible to score more than 60 for issue (c) since the SG 80 refers to the tools 'in use' in the fishery and not the tools 'in use or available'.

The requirements of the SG 80 level are therefore not clearly met.

References

Tremblay-Boyer L, J. Hampton, S. McKechnie and G. Pilling. (2018). Stock assessment of South Pacific albacore tuna. WCPFC-SC14-2018/ SA-WP-05. Rev. 2* (2 August 2018). https://www.wcpfc.int/node/31182

Overall Performance Indicator score	60
Condition number (if relevant)	**4.** SI a) By the second surveillance audit, demonstrate that well defined HCRs are in place for albacore tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. SI b) By the third surveillance audit, provide evidence that the selection of the harvest control rules for albacore tuna are robust to the main uncertainties. SI c) By the third surveillance audit, provide evidence that indicates that the tools in use for albacore tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.

PI 1.2.3 – Albacore: Information and monitoring

PI 1.2.3		**Relevant information is collected to support the harvest strategy**		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	**Yes**	**Yes**	**No**
Rationale				

This is the agreed harmonized score.

The south Pacific albacore stock has been monitored through the assessment work of the Secretariat of the Pacific Community (SPC).
The range of data available for albacore is described in the background section (Section 3.3.2) and includes information on stock structure, stock productivity, fleet composition, and other data such as the results of tagging.

There remain some important data gaps, however, as identified by Williams (2018 – and previous versions of this annual report). For UoA vessels, a key data gap comes from the low level of observer coverage, which limits the information available on the non-retained component of the catch.

Overall, given the size and complexity of the fishery, the range and comprehensiveness of the data available is impressive and improving all the time. Nonetheless, these data gaps do constrain stock assessments – as does bias and lack of precision in some of the data sets, particularly historical data. Perhaps more importantly, the albacore stock assessment continues to rely on commercial CPUE as an index of stock abundance, and although these data are carefully analysed and standardised as far as possible, there are no fishery-independent data sets with with which they can be compared, while issues such as spatial and temporal changes in catchability remain problematic. On this basis, the team concluded that SG 80 is met, but SG 100 is not met.

B	Monitoring			
	Guide post	Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	**Yes**	**Yes**	**No**
Rationale				

This is the agreed harmonized score.

Standardized abundance indices are regularly monitored by the Albacore Working Group. This working group aggregated catch and effort data into monthly 10x10 strata for the surface fishery, and 50x50 strata for the longline for standardization using generalized linear models.

Internationally systems are in place for recording catch and effort for all fishing entities fishing on South Pacific albacore. CCMs are required to annually report the following data for fishery monitoring: total annual catch (round weight by species) total annual effort (active vessels by fishery); catch-effort (summary of logbook data); biological data, (size composition, length or weight frequencies, sex information).

Removal of retained species are monitored annually through the Solomon Islands port inspections and logbooks.

There are several information related uncertainties with the assessment. Tremblay-Boyer et al. (2018) state that the main underlying source of difficulty concerns the basic structure of the fishery: exploitation is focused on the oldest segment of the population that are growing slowly or have

essentially ceased growing. This means that there is relatively little information in the model to inform on recruitment variability and the information in the data to support estimation of absolute population size is weak. There is also some conflict between some of the data sources available for the assessment including conflicts between the length-frequency data and CPUE series, and between troll length frequency samples and the age-length data. Growth was also a major uncertainty with an unresolved inconsistency in the growth rates indicated by the VB curve fitted to the age-at-length data and presumed annual modes in the size composition data for some gears.

Therefore the fishery does not meet the SG100.

	Comprehensiveness of information			
c	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		**Yes**	
Rationale				

This is the agreed harmonized score.

All fishery removals are considered in the south Pacific albacore stock assessment. No data gaps have been identified in the stock assessment. Overall there is adequate information on all fishery removals from the stock

References

Tremblay-Boyer et al 2018; Williams 2018.

Overall Performance Indicator score	80

PI 1.2.4 – Albacore: Assessment of stock status

PI 1.2.4		**There is an adequate assessment of the stock status**		
Scoring Issue		SG 60	SG 80	SG 100
	Appropriateness of assessment to stock under consideration			
a	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		**Yes**	**No**
Rationale				

This is the agreed harmonized score.

The assessment for south Pacific albacore tuna is described in the background (Section 3.3.2). Like previous assessments, it is an integrated, model-based assessment that is undertaken by an experienced and internationally recognised stock assessment program at the SPC. It is appropriate for the stock.

However, one 'major feature' relevant to the biology of the species and the nature of the UoA that is not taken into account in the present stock assessment is the fishery removals from this stock in the Eastern Pacific Ocean (EPO). While these are small relative to the catches in the WCPO, the IATTC has indicated that the assessment would benefit from their inclusion. Therefore, the SG100 is not met. The IATTC is planning to do a collaborative benchmark assessment with SPC in 2022 wherein the EPO catches will be included (IATTC 2018).

The requirements of the SG80 are met but not the SG100 on the basis of not including the EPO catches as an input to the stock assessment. This is slightly out of agreement with the outcome of the MSC harmonization meeting (Hong Kong 21-22 April 2016), however the difference is not material.

b	Assessment approach			
	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	**Yes**	**Yes**	
Rationale				

This is the agreed harmonized score.

As described in the background (Section 3.3.2) the assessment estimates stock status of south Pacific albacore stock status relative to a range of reference points. This meets the requirements of the SG 80 level.

c	Uncertainty in the assessment			
	Guide post	The assessment **identifies major sources** of uncertainty.	The assessment **takes uncertainty into account**.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

This is the agreed harmonized score.

As described in the background (Section 3.3.2) the assessment of albacore tuna has provided explicit commentary on the major sources of uncertainty, has assessed the sensitivity of the assessment to these uncertainties, and has evaluated current and future stock status relative to these in a probabilistic way.

This meets the requirements of the SG 60, SG 80 and SG 100 levels of this scoring issue.

d	Evaluation of assessment			
	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			**Yes**

Rationale

This is the agreed harmonized score.

There is an ongoing program of review of assessment assumptions and approaches by the staff in the SPC-OFP. Alternative hypotheses are continually being explored (within funding and time constraints) and assessments are updated and modified as required.

Model structure has been updated to reflect the availability of new data or new interpretations of existing data and a suite of sensitivity analyses have been undertaken to explore the impact of options such as changing assumptions for fixed parameters or different treatments of the data. Furthermore, retrospective analyses have been undertaken to explore any systematic biases in the model and the results used to adjust the reference case

Tremblay-Boyer et al. (2018) conducted extensive sensitivity analyses to evaluate alternative assumptions on the assessment results. Several hundred model runs were undertaken. Information was presented on the bounds of plausible model sensitivity to biological assumptions (natural mortality, steepness) and sensitivity to data inputs (alternative CPUE indices, length data weighting).

The assessment has been tested using a systematic exploration of the interactions among different sets of assumptions. This confirms that alternative hypothesis and assessment approaches have been rigorously explored.

	Peer review of assessment			
e	Guide post		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		**Yes**	**No**

Rationale

This is the agreed harmonized score.

Internal reviews are undertaken by SPC and there has been an external review of the assessment of Bigeye tuna (Ianelli et al. 2012) which provided recommendations that were also applicable to other similar assessments such as for albacore tuna. Many of those recommendations have been addressed with the latest yellowfin assessment.

There have also been external reviews commissioned of different aspects of the data analyses that feed into the assessments.

This is also a level of review provided by submission to the scientific committee of the WCPFC, at which experienced scientific staff from several countries attend, but we consider this to be internal to WCPFC processes.

This meets the SG 80 requirements but not those of the SG 100 level.

References

Tremblay-Boyer L, J. Hampton, S. McKechnie and G. Pilling. (2018). Stock assessment of South Pacific albacore tuna. WCPFC-SC14-2018/ SA-WP-05. Rev. 2* (2 August 2018).

Overall Performance Indicator score	85

PI 1.1.1 – Bigeye: Stock status

Scores for P1 have been adopted following harmonization discussions among CABs as outlined in Section 8.7. Harvest Strategy condition timelines reflect those from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021.

PI 1.1.1		**The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing**		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guide post	It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

This is the agreed harmonized score. (P1 rationales taken from Sieben et al. 2019).

The stock assessment does not provide a 'reference case' model. To evaluate stock status, the assessment team therefore based the scoring largely on the grid of 36 models constructed by the SC (SC14) since this is what the SC considered most appropriate for providing management advice.

For the purposes of scoring, the team considered the PRI to correspond to the agreed LRP (20%$SB_{F=0}$), although in practice this is likely to be a conservative estimate of the PRI, noting that it is ~70% of the median estimate of SB_{MSY} (28%SB_0 in the SC grid).

Based on the SC14 grid (Table 10, WCPFC (2018a)) there is high probability that the SB is above the LRP (36 out of 36 models). SC14 characterise the probability of SB<LRP as 0%, but in practice, it is clear that there is some uncertainty around stock status which is not quantified in this grid. The key uncertainty has been the growth model, but the additional work carried out in 2018 (Project 81), added to the existing 'new' growth model for 2017 provides additional confidence, such that SC14 decided to exclude the 'old' growth model as a sensitivity in the model output grid. This gives higher confidence than previously that the stock is above the LRP level with high probability.

The stock-recruit relationship is plotted in Figure 27 below (stock-recruit pairs from 1964-2014 (Scott et al., 2017)) and gives an opportunity to evaluate recruitment in relation to stock biomass directly. Biomass is reduced in the later part of the time series (crosses), and recruitment does not appear to change.

On balance, taking the conclusions of the SC grid as well as the sensitivities, and reviewing the stock-recruit information directly, the team concluded that there is a high degree of certainty that the stock is above the PRI; SG100 is met.

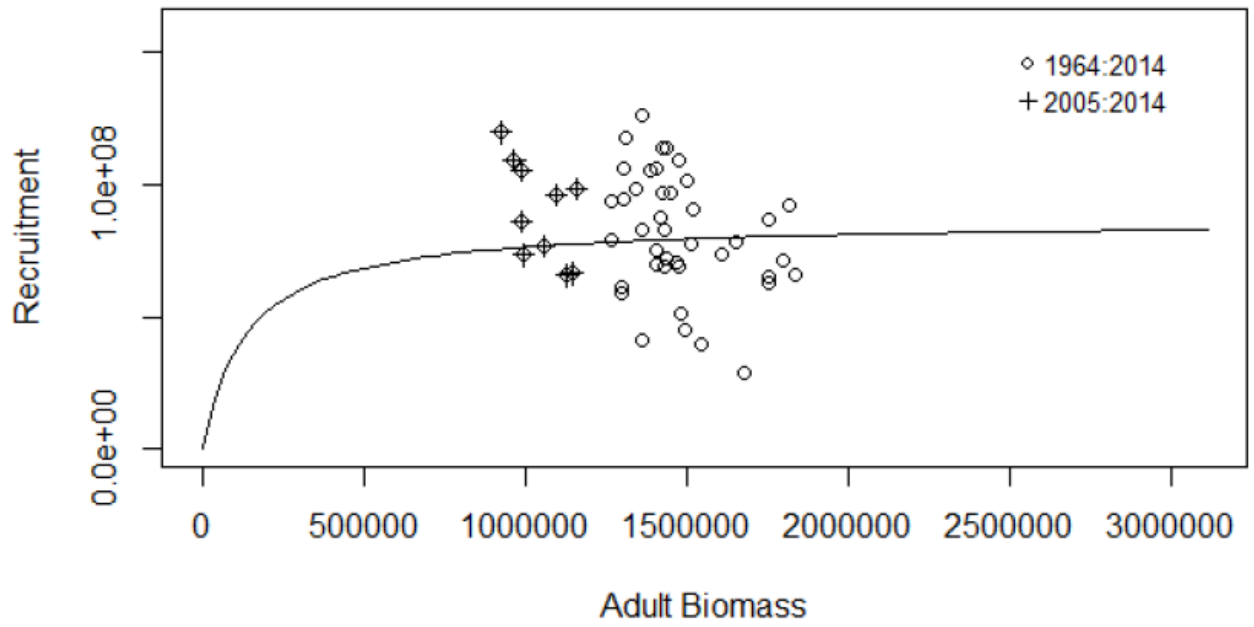

Figure 27. Stock-recruit pairs, 1964-2014 (circles), 2005 onwards marked with crosses (Scott et al. 2017).

	Stock status in relation to achievement of Maximum Sustainable Yield (MSY)			
b	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is **a high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		**Yes**	**Yes**
Rationale				

This is the agreed harmonized score.

SB_{MSY} is estimated (median estimate) at 28%SB_0. MSC provide a default value for B_{MSY} in terms of B_0 of 40%, but the guidance notes that this is only used if BMSY is not analytically determined (GSA 2.2.3.1). Therefore, for the purposes of scoring the team have used the analytically-determined median value of SB_{MSY} (i.e. 28%SB_0).

According to the SC14 grid, SB_{recent}/SB_{MSY} is estimated as follows: 1.38 (median), 1.12 (10% CI), 0.96 (Min i.e. one out of 36 – 2.8%) (Sieben et al. 2019). In other words, the stock is estimated to be at a level consistent with SBMSY with between 90% and 97% probability (the probability has not been directly quantified in either of the reports).

To consider FMSY: The SC14 grid estimates F/FMSY at 0.77 (median), 0.93 (90% CI), 1.06 (Min) (Sieben et al. 2019). SC14 provide a probability estimate of 6% (presumably two models out of 36) of $F>F_{MSY}$ (WCPFC, 2018a). Trends in F from the 2017 diagnostic model (new/2017) are given in Figure 28 below; there is little evidence of a significant trend in recent years. Catch is ~MSY or a little lower (median MSY estimate from SC14 grid 159 kt compared to 2015 catch of 152 kt).

In terms of biomass trajectory, as emphasised by both the stock assessment authors and the Scientific Committee (SC13 and SC14) the trajectory has been consistently downwards over the time series (see Figure 29 below). This means that over recent years, the stock has been in the current situation or better.

Scoring: The stock is at a level consistent with MSY (i.e. SB>SB$_{MSY}$, F<F$_{MSY}$, C=~MSY). SG80 is met. In relation to SG100, taking the structural uncertainty grid as defined by SC14, there is a probability of approximately 95% that SB>SB$_{MSY}$ and F<F$_{MSY}$, and the stock has been at or above this level over the entire time series. Therefore, SG100 is met.

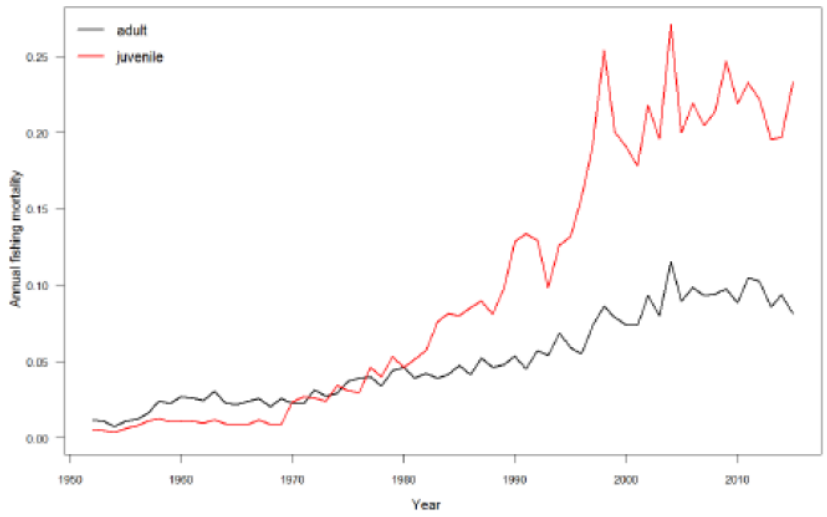

Figure 28. Time series of F (black: adult, red: juvenile) from the diagnostic model case model (new/2017) (McKechnie et al. 2017b).

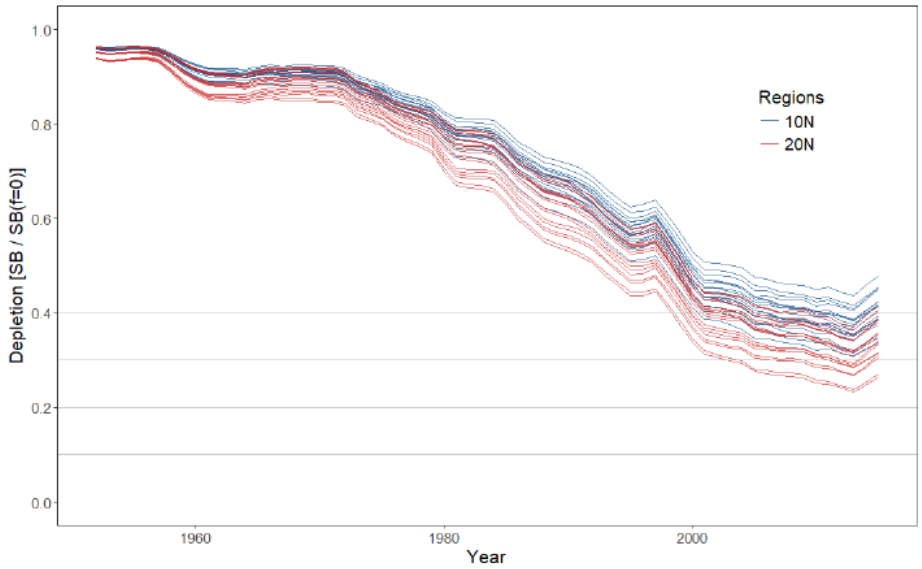

Figure 29. Trajectory of biomass depletion for the 36 models in the SC14 grid (blue: 2017 regional structure, red: 2014 regional structure).

References

Farley, J., Eveson, P., Krusic-Golub, K., Sanchez, K., Roupsard, C., McKechnie, F., Nicol, S., Leroy, S., Smith, B., Chang, N., 2017b. Project 35: Age, growth and maturity of bigeye tuna in the western and central Pacific Ocean. Scientific Committee, 13th regular session, Rarotonga, Cook Islands, 9-17 August 2017, WCPFC-SC13-2017/SA-WP-01. https://www.wcpfc.int/node/29514

Farley, J., Eveson, P., Krusic-Golub, K., Clear, N., Sanchez, C., Roupsard, F., Satoh, K., Smith, N., Hampton, J., 2018b. Update on age and growth of bigeye tuna in the WCPO: WCPFC Project 81. CSIRO Oceans and Atmosphere; WCPFC-SC14-2018/ SA-WP-01. https://www.wcpfc.int/node/31012

McKechnie, S., Pilling, G., Hampton, J., 2017b. Stock assessment of bigeye tuna in the western and central Pacific Ocean. WCPFC-SC13-2017/SA-WP-05, Rarotonga, Cook Islands, 9–17 August. https://www.wcpfc.int/node/29518

Scott, R., Pilling, G.M., McKechnie, S., 2017. Stochastic status quo projections for bigeye tuna. WCPFC Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/SA-IP-22. https://www.wcpfc.int/node/29745.

Sieben et al. 2019. Stewardship Council (MSC) Final Report. MIFV RMI EEZ Longline Yellowfin and Bigeye Tuna Fishery. On behalf of Marshall Islands Fishing Venture (MIFV). Prepared by Control Union Pesca Ltd. https://fisheries.msc.org/en/fisheries/mifv-rmi-eez-longline-yellowfin-and-bigeye-tuna/@@assessments.

WCPFC 2018a. Summary Report. Fourteenth Regular Session of the Scientific Committee. Busan, South Korea. 8–16 August 2018. https://www.wcpfc.int/node/32155.

Vincent, M., Pilling, G., Hampton, J., 2018. Incorporation of updated growth information within the 2017 WCPO bigeye stock assessment grid, and examination of the sensitivity of estimates to alternative model spatial structures. WCPFC Scientific Committee Fourteenth Regular Session, Busan, Korea, 8-16 August 2018; WCPFC-SC14-2018/ SA-WP-03. https://www.wcpfc.int/node/31047

WCPFC, 2017a. Thirteenth Regular Session of the Scientific Committee, Rarotonga, Cook Islands, 9-17 August, 2017. Western and Central Pacific Fisheries Commission. https://www.wcpfc.int/node/29904

Stock status relative to reference points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	Limit reference point	$20\%SB_{F=0}$	SB_{recent} = $36\%SB_{F=0}$ = 1.8LRP; SB_{latest} = $42\%SB_{F=0}$ = 2.1LRP (median of SC uncertainty grid)
Reference point used in scoring stock relative to MSY (SIb)	MSY reference point	SB_{MSY}	SB_{recent} = $1.38SB_{MSY}$; SB_{latest} = $1.62\ SB_{MSY}$ (median of SC uncertainty grid)
Overall Performance Indicator score		**100**	

PI 1.1.2 – Bigeye: Stock rebuilding – Not applicable

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	Rebuilding timeframes			
	Guide post	A rebuilding timeframe is specified for the stock that is the **shorter of 20 years or 2 times its generation time**. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock.
	Met?	**N/A**		**N/A**
Rationale				

The stock does not require rebuilding

b	Rebuilding evaluation			
	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is **evidence** that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.	There is **strong evidence** that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.
	Met?	**N/A**	**N/A**	**N/A**
Rationale				

The stock does not require rebuilding

References

Overall Performance Indicator score	**N/A**

PI 1.2.1 – Bigeye: Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guide post	The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	**Yes**	**No**	
Rationale				

This is the agreed harmonized score. (P1 rationales taken from Sieben et al. 2019).

MSC defines a harvest strategy as 'the combination of monitoring, stock assessment, harvest control rules and management actions, which may include an MP or an MP (implicit) and be tested by MSE' (MSC – MSCI Vocabulary v1.1).

The stated objective of the WCPFC harvest strategy as defined in CMM 2017-01 is to maintain status quo biomass, pending agreement on a formal target reference point, due in 2019 according to the latest version of the harvest strategy workplan (see Section 3.3.2). CMM 2014-06 commits WCPFC to developing a formal harvest strategy for yellowfin and the other key stocks; none of the key milestones for bigeye have yet been met however; at WCPFC14 the workplan was refocused from rebuilding to agreeing a long-term HCR, based on the results of the 2017 stock assessment (see harvest strategy workplan; Attachment L in the summary report from WCPFC14; Attachment I in the summary report from WCPFC15). For the moment, the elements of the WCPFC harvest strategy are the following:

- Data collection on the stock and fishery (considered in detail in PI 1.2.3 below)
- Stock assessment process (considered in detail in PI 1.2.4 below)
- Limit reference point (20%$SB_{F=0}$) and management target (SB2012-15; from CMM 2017-01) (see Section 3.5.3)
- 'Available' HCR (see 1.2.2), with some management tools set out in 2017-01 (described in Section 3.3);
- Monitoring of implementation of CMM 2018-01 via data gathering and Part 1 and 2 reports to the Commission.

This management strategy is reviewed annually during the Commission meeting.

PNA harvest strategy:
PNA operate a purse seine vessel day scheme (VDS) which limits effort by setting an overall 'TAE' (total allowable effort) which is divided up for each of the parties to the agreement. The TAE is set annually based on objectives of 'optimal exploitation' as well as WCPFC provisions (which presumably means MSY). The days are set based on the objective of limiting purse seine effort to 2010 levels (which was a requirement of the previous tropical tuna CMMs, although not since 2017-01). The purse seine VDS is relevant for bigeye because most of the F on juveniles comes from the purse seine fishery (see Figure 28 in PI 1.1.1b). A longline VDS has recently been established but plays a limited role in management for the moment.

Overall scoring:
The objective of the current harvest strategy is to maintain the status quo (WCPFC: average $SB/SB_{F=0}$ for 2012-2015; PNA: purse seine effort at a maximum of 2010 levels). The most recent stock assessment suggests that the status quo is an acceptable short-term biological target for bigeye (see PI 1.1.1 and projections in Table 10). The tropical tuna bridging measures (2017-01, 2018-01) have overall somewhat weakened management provisions in relation to bigeye compared to the previous measure (2016-01), which was aimed at rebuilding the stock. It does not on this basis comply with the advice of the SC13 prior to the WCPFC 2017 plenary (SC13 report para. 241): SC13 recommends as a precautionary approach that the fishing mortality on bigeye tuna stock should not be increased from current level to maintain current or increased spawning biomass until the Commission can agree on an appropriate target reference point (TRP). SC14 reiterated the same advice (SC14 report para. 182). Status quo projections (Scott et al., 2017; WCPFC, 2018a) provide a basis on which to evaluate the extent to which the harvest strategy is expected to achieve stock management objectives. The projections are summarised in Sieben et al. 2019, which gives the estimated probability of SB falling below the LRP by 2045 in the range 0-18% based on status quo and 'optimistic' fishery scenarios, which is acceptable given that the harvest strategy is intended to be revised significantly prior to 2045.

Given the ongoing work to put in place an improved management target and harvest strategy (2014-06 and workplan; see above and Section 3.3.4), assuming this progresses, the impact on the stock status from changes in the transition from 2016-01 to 2017-01 and 2018-01 will probably not be significant; or at least will be lost in the much larger uncertainty about stock status derived from the choice of growth model and regional structure. Furthermore, the acceptance by SC14 of the 'updated new' growth model as the best scientific data on which to base stock assessments has considerably reduced the uncertainty around stock status. On this basis, SG60 can be considered to be met. SG80 is however not met.

	Harvest strategy evaluation			
b	Guide post	The harvest strategy is **likely** to work based on prior experience or plausible argument.	The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	**Yes**	**Yes**	

Rationale

This is the agreed harmonized score.

As noted above, stock status projections suggest that current management is precautionary in the short term. The stock assessment model based on the updated new growth curve, even with other sources of uncertainty remaining, suggests that the biomass will remain above the LRP with high probability.

Management measures over the past few years (2013-01 – 2018-01) have been adjusted (strengthened from 2013-01 through 2016-01 and then weakened in 2017-01; 2018-01 is more or less identical to 2017-01 as concerns bigeye) but probably not in a way that has had a significant impact on the stock (although stock status is only estimated to 2015; i.e. in the terminal year of the assessment, 2014-01 was in force).

The team considered that the estimated low probability that SB<LRP and $F>F_{MSY}$ constitutes 'evidence' that the harvest strategy is working. SG80 is therefore met. The current harvest strategy is a stop-gap and has not been fully evaluated, although projections suggest that in the longer term, depending on recruitment, it risks increasing F to unsustainable levels (Table 12, Sieben et al. 2019). SG100 is not met.

c	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	**Yes**		
Rationale				

This is the agreed harmonized score.

Monitoring of the fishery for the purposes of stock assessment is considered in PI 1.2.3 below, and the analysis of data is considered under PI 1.2.4. Monitoring of the implementation of the harvest strategy (notably CMM 2018-01 and its predecessors) is carried out via self-assessment by CCMs, included in their Part 1 and 2 reports submitted to WCPFC annually. For RMI, MIMRA monitors the fishery via logsheets, port sampling and VMS. SG 60 is met.

d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			**Not scored**
Rationale				

Not scored as not all SG 80 scoring issues are met.

e	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**N/A**	**N/A**	**N/A**
Rationale				

Sharks are not a target species.

f	Review of alternative measures			
	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	**NA**	**NA**	**NA**
Rationale				

This fishery targets bigeye specifically, and there are no requirements such as minimum or maximum landing sizes or quotas which could lead to any of this catch being unwanted. Overall discarding rates

for bigeye are minimal, according to the stock assessment report. There is also negligible discarding of bigeye from the UoA, since it is a valuable target species (according to the UoA's observer data, 99.5% of bigeye is retained). Hence there is no 'unwanted catch'* of bigeye in this fishery.

* SA3.1.6: The term 'unwanted catch' shall be interpreted by the team as the part of the catch that a fisher did not intend to catch but could not avoid, and did not want or chose not to use.

References

McKechnie, S., Pilling, G., Hampton, J., 2017b. Stock assessment of bigeye tuna in the western and central Pacific Ocean. WCPFC-SC13-2017/SA-WP-05, Rarotonga, Cook Islands, 9–17 August. https://www.wcpfc.int/node/29518

Scott, R., Pilling, G.M., McKechnie, S., 2017. Stochastic status quo projections for bigeye tuna. WCPFC Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/SA-IP-22. https://www.wcpfc.int/node/29745.

Sieben et al. 2019. Stewardship Council (MSC) Final Report. MIFV RMI EEZ Longline Yellowfin and Bigeye Tuna Fishery. On behalf of Marshall Islands Fishing Venture (MIFV). Prepared by Control Union Pesca Ltd. https://fisheries.msc.org/en/fisheries/mifv-rmi-eez-longline-yellowfin-and-bigeye-tuna/@@assessments.

Vincent, M., Pilling, G., Hampton, J., 2018. Incorporation of updated growth information within the 2017 WCPO bigeye stock assessment grid, and examination of the sensitivity of estimates to alternative model spatial structures. WCPFC Scientific Committee Fourteenth Regular Session, Busan, Korea, 8-16 August 2018; WCPFC-SC14-2018/ SA-WP-03. https://www.wcpfc.int/node/31047

WCPFC, 2017a. Thirteenth Regular Session of the Scientific Committee, Rarotonga, Cook Islands, 9-17 August, 2017. Western and Central Pacific Fisheries Commission. https://www.wcpfc.int/node/29904

WCPFC, 2017b. Fourteenth Regular Session of the Commission, Manila, Philippines, 3-7 December 2017: Draft Summary Report. Western and Central Pacific Fisheries Commission. https://www.wcpfc.int/node/30295

WCPFC 2018a. Summary Report. Fourteenth Regular Session of the Scientific Committee. Busan, South Korea. 8–16 August 2018. https://www.wcpfc.int/node/32155.

CMMs 2018-01, 2017-01, 2014-06, 2013-01, 2014-01, 2015-01, 2016-01

Overall Performance Indicator score	70
Condition number (if relevant)	5. By the third surveillance audit, demonstrate that the harvest strategy for bigeye tuna is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.

PI 1.2.2 – Bigeye: Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	**Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	**Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time.
	Met?	**Yes**	**No**	
Rationale				

This is the agreed harmonized score. (P1 rationales taken from Sieben et al. 2019).

In the 2017 stock assessment, only the model set with the old growth model (now removed from the grid) plus the 2014 regional structure puts the stock biomass below SB_{MSY} at any point. According to the 2018 update (SC14 grid), stock biomass has been above the estimated MSY level throughout the time series for all models; only one model out of 36 (recent) or zero (latest) put $SB<SB_{MSY}$ in the current time period. Based on the SC grid, the probability that $F>F_{MSY}$ is estimated to be ~6%. $p(SB<SB_{MSY})$ is not quoted in the SC14 report, but from Table 11 (Sieben et al. 2019) can be seen to be <10% (see PI 1.1.1b); p(SB<LRP) is estimated to be ~0%. The biomass trajectory is stable or (possibly) increasing in the terminal year and F is ~stable (see PI 1.1.1). On this basis, SA2.5.2a is met.

WCPFC have an agreed, legally-binding framework in place to establish formal harvest strategies and control rules for their main stocks, including WCPO bigeye (see CMM 2014-06 and associated workplans; Section 3.3). SA2.5.3b is therefore met. On this basis, a HCR can be considered to be 'available' for this stock. SG60 is met. Since the harvest strategy is not 'in place', SG80 is not met.

b	HCRs robustness to uncertainty			
	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.
	Met?		**No**	
Rationale				

This is the agreed harmonized score.

Since a HCR is 'available' rather than 'in place', it cannot be argued to be robust to the main uncertainties. SG 80 is not met.

C	HCRs evaluation			
	Guide post	There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation.	**Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	**Yes**	**No**	

Rationale

This is the agreed harmonized score.

Under SA2.5.5, in order to conclude that 'available' HCRs are 'effective' (SG60), MSC requires evidence of i) the use of effective HCRs in other stocks or fisheries under the same management body; or ii) a formal agreement or framework with trigger levels which will require the development of a well-defined HCR. It also requires consideration of current exploitation rates in relation to biological reference points and the agreed trigger level (guidance for SA2.5.6: 'evidence that current F is equal to or less than F_{MSY} should usually be taken as evidence that the HCR is effective').

A formal framework is in place for the development of a harvest strategy for the stock (CMM 2014-06 and workplans; see above). F is estimated by SC14 to be below F_{MSY} with ~94% probability. The criteria for 'available' tools at SG60 are therefore met. SG80 is not met because the HCR does not include well-defined target exploitation levels.

References

McKechnie, S., Pilling, G., Hampton, J., 2017b. Stock assessment of bigeye tuna in the western and central Pacific Ocean. WCPFC-SC13-2017/SA-WP-05, Rarotonga, Cook Islands, 9–17 August. https://www.wcpfc.int/node/29518

Vincent, M., Pilling, G., Hampton, J., 2018. Incorporation of updated growth information within the 2017 WCPO bigeye stock assessment grid, and examination of the sensitivity of estimates to alternative model spatial structures. WCPFC Scientific Committee Fourteenth Regular Session, Busan, Korea, 8-16 August 2018; WCPFC-SC14-2018/ SA-WP-03. https://www.wcpfc.int/node/31047

WCPFC, 2017a. Thirteenth Regular Session of the Scientific Committee, Rarotonga, Cook Islands, 9-17 August, 2017. Western and Central Pacific Fisheries Commission. https://www.wcpfc.int/node/29904

WCPFC, 2017b. Fourteenth Regular Session of the Commission, Manila, Philippines, 3-7 December 2017: Draft Summary Report. Western and Central Pacific Fisheries Commission. https://www.wcpfc.int/node/32155

WCPFC 2018a. Summary Report. Fourteenth Regular Session of the Scientific Committee. Busan, South Korea. 8–16 August 2018. https://www.wcpfc.int/node/32155.

Overall Performance Indicator score	60
Condition number (if relevant)	6. SI a) By the third surveillance audit, demonstrate that well defined HCRs are in place for bigeye tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY.

	SI b) By the third surveillance audit, provide evidence that the selection of the harvest control rules for bigeye tuna are robust to the main uncertainties. SI c) By the third surveillance audit, provide evidence that indicates that the tools in use for bigeye tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.

PI 1.2.3 – Bigeye: Information and monitoring

PI 1.2.3		**Relevant information is collected to support the harvest strategy**		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

This is the agreed harmonized score. (P1 rationales taken from Sieben et al. 2019).

The following information is available, and is used as part of the harvest strategy – notably to inform the stock assessment model:

1. Fishery-dependent information
Catch, effort and CPUE: It is a requirement for all CCM fisheries to provide catch and effort data to WCPFC/SPC, and unlike in the past, most key fleets now provide operational (logbook) rather than just aggregate data (Williams, 2017). Catch and effort data go back to 1950, although as expected, historical data are sparser and generally less reliable than more recent data. The logsheet data are

raised to best estimates of total catch by SPC-OFP, to account for missing data. Purse seine catch is allocated to species via an agreed methodology ('Method 3') (Hampton and Williams, 2017). Longline CPUE data are analysed and standardised as described in McKechnie et al. (2017a) and provide the key stock assessment input; purse seine CPUE is not used because of difficulty in measuring effort.

Length/weight-frequency data: Size-frequency data come from various port sampling programmes and some observer reports, and go back to the 1960s. These data are weighted in the stock assessment according to spatial representation, to account for differences in length-frequency by geographic region.

Fleet composition: Each CCM provides information to WCPFC annually on their active fleet, in their Part 1 reports.

2. Fishery-independent information
Size and age data: Age and growth has been a big issue for this assessment. The work done by CSIRO (Farley et al, 2017b; 2018b) is considered to be very detailed compared to what is available for most stocks, and SC14 agreed to accept their 'updated new' growth model as the best scientific data available for stock assessment. Concerns expressed at SC13 is that it did not include enough very large and very small fish are addressed by 'Project 81' and the 2018 update assessment

Natural mortality: Estimating natural mortality is always a big problem. For bigeye (and other WCPO stocks), the methodology set out in Hoyle and Nichol (2008) is used to estimate M-at-length by sex, based on the levels of M which give the observed divergence in sex ratio after maturity. This M-at-length vector is then used to calculate a M-at-age vector using the growth curve, which is the input to the stock assessment model. The new growth information has therefore resulted in a new M vector.

Environmental data: The Ocean Fisheries Programme of SPC undertaken environmental research as part of their ecosystem monitoring programme, focusing particularly on potential environmental drivers of tuna population dynamics.

3. Stock structure
The WCPO bigeye fishery is assessed and managed as a single stock in the WCPFC Convention Area, although there is strong evidence for mixing across the WCPFC/IATTC boundary (Section 3.5.1). Some work has been done to evaluate the usefulness of a combined management approach (McKechnie et al., 2015a), which concluded that the approach of separate assessments in the WCPO and the EPO was appropriate for now. SC4, however, suggested that stock assumptions could be re-evaluated (see Section 3.5.1).

4. Information inferred from the stock assessment
A significant range of information relating to stock status comes as the output of the stock assessment (McKechnie et al., 2017b; WCPFC 2017b) including estimates of spawner potential, recruitment, fishery impact etc.

5. Data gaps
Observer coverage (providing external verification of logbook data and information about discards) is low for the longline fishery. There is no external fishery-independent biomass indicator (such as a survey); which would be extremely difficult given the spatial scale of the stock and fishery. There remain significant data gaps for the large and diverse fisheries in Vietnam, Indonesia and the Philippines, although the data have improved in recent years.

Given the size and complexity of the fishery, the range and comprehensiveness of the data available is impressive and improving all the time. Data gaps that previously constrained stock assessments, notably age-and-growth data, have been filled. There remains bias and lack of precision in some of the datasets, particularly historical data; as well as uncertainty in others, but this is inevitable for any fishery.

Overall, the major work that has gone into developing a growth curve, which has been agreed by the WCPFC Scientific Committee to represent the best available scientific information and accepted as appropriate for the stock assessment and provision of scientific advice, has removed a major source of uncertainty that remains for other stocks (e.g. similar work 'Project 82') is currently ongoing for yellowfin and due to be presented to SC15 (Farley et al., 2018a). The key remaining source of

uncertainty in the stock assessment relates not to any source of information but to the model structure and is analysed in the 2018 stock assessment update (Vincent et al., 2018) based on detailed information about the spatial distribution of catch by gear. On this basis, the team concluded that SG100 is met.

b	Monitoring			
	Guide post	Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	**Yes**	**Yes**	**No**
Rationale				

This is the agreed harmonized score.

Fishery removals are monitored by individual CCMs via logsheets and port sampling, and are required to be submitted to the Commission annually, in the form of estimates of total catch plus catch and effort data broken down by gear and either aggregated (5o squares by month) or (preferably) at operational level (individual logsheet level). Despite some gaps in this dataset, coverage is good overall. This catch, effort and CPUE dataset is the key data set for the stock assessment. Other fisheries data which support management are size-frequency data (collected via port sampling and observer programmes) and tag returns. Biological data are also collected via research programmes (e.g. Farley et al. 2017b; 2018b).

Formal stock assessments have taken place every few years (2011, 2014, 2017 updated 2018). In between formal stock assessments, SPC provide some information on trends in fishery indicators (total catch, nominal CPUE, catch at length and at weight, status quo projections), to guide management (e.g. (Pilling et al., 2016; Brouwer et al., 2018)).

On this basis, the team felt that SG80 was met. SG100 is not met, for the following reasons:

- The characteristics of tuna longline CPUE are often poorly understood and it is unclear how successful most effort standardization analyses are or how to properly represent the uncertainties;
- Purse seine catch and length-frequency data can be biased by grab-sampling techniques used to estimate species composition (although there is an agreed methodology used to avoid bias as far as possible; see Hampton and Williams (2017));
- Some data gaps remain in fishery-dependent data (see Section 3.5.5);
- The requirement to 'raise' logsheet data by estimates of total catch (to account for missing logsheets) results in some loss of precision.
- Historical data are often lacking in precision;
- Although the frequency of stock assessments is reasonable, they are not carried out with 'high frequency' (i.e. not annually).

Although uncertainty in the most recent stock assessment (2018 update) has been much reduced, it is not completely clear how robust the management is to uncertainty – the management system is still a work in progress.

c	Comprehensiveness of information

	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		**Yes**	

Rationale

This is the agreed harmonized score.

WCPFC and SPC work hard to quantify all sources of removals and include them in the stock assessment. Small-scale (but extensive) fisheries in Indonesia, the Philippines and Vietnam have in the past been a particular problem, and there has been ongoing work for quite a few years to quantify the catch (and where possible effort) from these fisheries (described in Tremblay-Boyer et al. (2017)). According to the 2017 stock assessment report, there has been gradual improvement in the data from Indonesia and the Philippines over the last decade or so; since the last assessment, catch data from Vietnam has also been available and is included in the 2017/2018 assessment.

At the 2017 pre-assessment workshop (PAW), it was noted that there is some potential for under-reporting of bigeye catch, and the workshop (Pilling and Brouwer, 2017) requested SPC to include a one-off sensitivity with this potential IUU fish added to the catch history (details of how this was done are given in McKechnie et al. (2017a). It did not have a significant effect on the conclusions of the assessment, which were a little more positive (see McKechnie et al., 2017b - Appendix, Table 10).

References

Brouwer, S., Pilling, G., Williams, P., John Hampton, and, 2018. A compendium of fisheries indicators for tuna stocks. Scientific Committee, Fourteenth Regular Session, Busan, Republic of Korea, 8-16 August 2018. WCPFC-SC14-2018/ SA-WP-02. https://www.wcpfc.int/node/30987

Farley, J., Eveson, P., Krusic-Golub, K., Sanchez, K., Roupsard, C., McKechnie, F., Nicol, S., Leroy, S., Smith, B., Chang, N., 2017b. Project 35: Age, growth and maturity of bigeye tuna in the western and central Pacific Ocean. Scientific Committee, 13th regular session, Rarotonga, Cook Islands, 9-17 August 2017, WCPFC-SC13-2017/SA-WP-01. https://www.wcpfc.int/node/29514

Farley, J., Eveson, P., Krusic-Golub, K., Clear, N., Sanchez, C., Roupsard, F., Satoh, K., Smith, N., Hampton, J., 2018b. Update on age and growth of bigeye tuna in the WCPO: WCPFC Project 81. CSIRO Oceans and Atmosphere; WCPFC-SC14-2018/ SA-WP-01. https://www.wcpfc.int/node/31012

Farley, J., Krusic-Golub, K., Clear, N., Eveson, P., Smith, N., 2018a. Progress on yellowfin tuna age and growth in the WCPO WCPFC: Project 82. WCPFC Scientific Committee, Fourteenth Regular Session, Busan, Republic of Korea, 8-16 August 2018. https://www.wcpfc.int/node/31097

Hampton, J., Williams, P., 2017. Annual estimates of purse seine catches by species based on alternative data sources. Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/ST-IP-03. https://www.wcpfc.int/node/29507

Hoyle, S., Nichol, S., 2008. Sensitivity of bigeye stock assessment to alternative biological and reproductive assumptions. Scientific Committee, 4th Regular Session, Port Moresby, Papua New Guinea, 11-22 August 2008. WCPFC-SC4-2008/ME-WP-01. https://www.wcpfc.int/node/1276

McKechnie, S., Tremblay-Boyer, L., Pilling, G., 2017a. Background analyses for the 2017 stock assessments of bigeye and yellowfin tuna in the western and central Pacific Ocean. WCPFC-SC13-2017/SA-IP-06. https://www.wcpfc.int/node/29530

McKechnie, S., Hampton, J., Abascal, F., Davies, N., Harley, S.J., 2015b. Sensitivity of WCPO stock assessment results to the inclusion of EPO dynamics within a Pacific-wide analysis. WCPFC-SC11-2015/SA-WP-03. https://www.wcpfc.int/node/21774

McKechnie, S., Pilling, G., Hampton, J., 2017b. Stock assessment of bigeye tuna in the western and central Pacific Ocean. WCPFC-SC13-2017/SA-WP-05, Rarotonga, Cook Islands, 9–17 August. https://www.wcpfc.int/node/29518

Pilling, G., Brouwer, S., 2017. Report from the SPC pre-assessment workshop, Noumea, April 2017. Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/SA-IP-02. https://www.wcpfc.int/node/29374

McKechnie, S., Pilling, G., Hampton, J., 2017b. Stock assessment of bigeye tuna in the western and central Pacific Ocean. WCPFC-SC13-2017/SA-WP-05, Rarotonga, Cook Islands, 9–17 August. https://www.wcpfc.int/node/29518

Scott, R., Pilling, G.M., McKechnie, S., 2017. Stochastic status quo projections for bigeye tuna. WCPFC Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/SA-IP-22. https://www.wcpfc.int/node/29745.

Vincent, M., Pilling, G., Hampton, J., 2018. Incorporation of updated growth information within the 2017 WCPO bigeye stock assessment grid, and examination of the sensitivity of estimates to alternative model spatial structures. WCPFC Scientific Committee Fourteenth Regular Session, Busan, Korea, 8-16 August 2018; WCPFC-SC14-2018/ SA-WP-03. https://www.wcpfc.int/node/31047

WCPFC, 2017a. Thirteenth Regular Session of the Scientific Committee, Rarotonga, Cook Islands, 9-17 August, 2017. Western and Central Pacific Fisheries Commission. https://www.wcpfc.int/node/29904

WCPFC 2018a. Summary Report. Fourteenth Regular Session of the Scientific Committee. Busan, South Korea. 8–16 August 2018. https://www.wcpfc.int/node/32155.

Overall Performance Indicator score	**90**

PI 1.2.4 – Bigeye: Assessment of stock status

PI 1.2.4		**There is an adequate assessment of the stock status**		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		**Yes**	**Yes**
Rationale				

This is the agreed harmonized score. (P1 rationales taken from Sieben et al. 2019).

The assessment is conducted using an integrated assessment model Multifan-CL (MFCL) that is able to combine a range of datasets and to model several components, including (i) the dynamics of the fish population (growth, natural mortality, maturity and fecundity, recruitment); (ii) the fishery dynamics; (iii) the dynamics of tagged fish; (iv) the observation models for the data. The model partitions the population into 9 spatial regions and 28 quarterly age-classes and defines fisheries to consist of relatively homogeneous fishing units that have selectivity and catchability characteristics that do not vary greatly over time and space, although in the case of catchability some allowance can be made for time series variation. SPC have considerable experience in the development and application of MFCL. SG100 is met.

b	Assessment approach			
	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	**Yes**	**Yes**	
Rationale				

This is the agreed harmonized score.

The stock assessment estimates stock status relative to a range of reference points, including SB and F reference points and depletion and MSY-based reference points; see Table 12 and PI 1.1.1. SG80 is met.

c	Uncertainty in the assessment			
	Guide post	The assessment **identifies major sources** of uncertainty.	The assessment **takes uncertainty into account**.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

This is the agreed harmonized score.

The assessment is a sophisticated statistical assessment which allows input parameters to vary stochastically within parameters defined by the assessors. The key means by which uncertainty in terms of the input values themselves is taken into account is via defining sensitivity runs (described in Section 3.5.6). SG80 is met.

The probability of the stock being above or below a given reference level, as quoted in PI 1.1.1, is evaluated based on a model grid which is defined across an agreed set of these sensitivities (e.g. as per Table 10). The probabilities quoted in PI 1.1.1 are based on the SC14 grid, as explained in the rationale for PI 1.1.1. In practice, the uncertainty around these estimates is greater than these probabilities suggest, because they do not incorporate the uncertainty about which grid to choose (which is basically unquantifiable) – this is emphasised in the 2017 stock assessment report. It should be noted that this is no different to any other stock assessment; it is just brought into relief here by the fact that two of the sensitivities in the 2017 assessment have a significant impact on the stock assessment conclusions. Probability is quantified to the extent possible; on this basis, SG100 is met.

d	Evaluation of assessment			
	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			**Yes**

Rationale

This is the agreed harmonized score.

Alternative hypotheses in terms of model input parameter values or estimation methods, or model structure, are explored based on sensitivities, as described above (see Table 10). The transition from the 2014 reference case to the 2017 diagnostic case model is explained in Section 3.5.6, and shows the new or changed inputs and how they have been carefully evaluated at each stage. Alternative hypotheses are also explored externally; for example, an alternative Pacific-wide stock structure is considered in McKechnie et al. (2015b) (although based on the new growth model, SC14 recommend revisiting this hypothesis). Tremblay-Boyer et al. (2017a) considers the use of geo-statistics as an new method of standardising CPUE; opportunities for improving the input data (e.g. Peatman et al. (2017)) or developing new sources of input data (e.g. PNA (2017)) are considered by the SC each year. The conclusions of the 2017 stock assessment are not particularly robust in terms of providing a definitive conclusion about the stock status but this is not the fault of the assessment, and in fact the uncertainty associated with the assessment outcome is in some ways a consequence of the effectiveness of the assessment in considering all possible hypotheses. In any case, uncertainty in the 2018 updated assessment is reduced by the decision of the Scientific Committee to exclude the old growth model from the structural uncertainty grid (nicely illustrating the point made in the rationale for SIc).

e	Peer review of assessment			
	Guide post		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		**Yes**	**Yes**

Rationale

This is the agreed harmonized score.

The initial proposed approach from SPC is reviewed by external scientists in a pre-assessment workshop (Pilling and Brouwer, 2017). The final assessment is then evaluated by the Scientific Committee who make a decision on the composition of the uncertainty grid to be used for providing advice to the Commission. A previous bigeye assessment (2011) had a formal external review (Ianelli et al., 2012). SG100 is met.

References

Farley, J., Eveson, P., Krusic-Golub, K., Sanchez, K., Roupsard, C., McKechnie, F., Nicol, S., Leroy, S., Smith, B., Chang, N., 2017b. Project 35: Age, growth and maturity of bigeye tuna in the western and central Pacific Ocean. Scientific Committee, 13th regular session, Rarotonga, Cook Islands, 9-17 August 2017, WCPFC-SC13-2017/SA-WP-01. https://www.wcpfc.int/node/29514

McKechnie, S., Tremblay-Boyer, L., Pilling, G., 2017a. Background analyses for the 2017 stock assessments of bigeye and yellowfin tuna in the western and central Pacific Ocean. WCPFC-SC13-2017/SA-IP-06. https://www.wcpfc.int/node/29530

McKechnie, S., Pilling, G., Hampton, J., 2017b. Stock assessment of bigeye tuna in the western and central Pacific Ocean. WCPFC-SC13-2017/SA-WP-05, Rarotonga, Cook Islands, 9–17 August. https://www.wcpfc.int/node/29518

McKechnie, S., Hampton, J., Abascal, F., Davies, N., Harley, S.J., 2015b. Sensitivity of WCPO stock assessment results to the inclusion of EPO dynamics within a Pacific-wide analysis. WCPFC-SC11-2015/SA-WP-03. https://www.wcpfc.int/node/21774

Peatman, T., Smith, N., Park, T., Caillot, S., 2017. Better purse seine catch composition estimates: recent progress and future workplan for Project 60. Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/ST-WP-02. https://www.wcpfc.int/node/29497

PNA, 2017. FAD data to be provided by observers. Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/ST-WP-06. https://www.wcpfc.int/node/29501

Vincent, M., Pilling, G., Hampton, J., 2018. Incorporation of updated growth information within the 2017 WCPO bigeye stock assessment grid, and examination of the sensitivity of estimates to alternative model spatial structures. WCPFC Scientific Committee Fourteenth Regular Session, Busan, Korea, 8-16 August 2018; WCPFC-SC14-2018/ SA-WP-03. https://www.wcpfc.int/node/31047

WCPFC, 2017a. Thirteenth Regular Session of the Scientific Committee, Rarotonga, Cook Islands, 9-17 August, 2017. Western and Central Pacific Fisheries Commission. https://www.wcpfc.int/node/29904

WCPFC 2018a. Summary Report. Fourteenth Regular Session of the Scientific Committee. Busan, South Korea. 8–16 August 2018. https://www.wcpfc.int/node/32155.

Overall Performance Indicator score	100

PI 1.1.1 – Swordfish: Stock status

PI 1.1.1	**The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing**		
Scoring Issue	SG 60	SG 80	SG 100
a Stock status relative to recruitment impairment			
Guide post	It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.
Met?	**Yes**	**Yes**	**Yes**
Rationale			

The latest stock assessment (Takeuchi et al. 2017) provides estimates of the level of spawning stock biomass, spawning potential and recruitment which, from an integrated model, are all related. In this assessment SB_{MSY} has been analytically determined to be 0.22 of $SB_{F=0}$ (from the mean across the uncertainty grid) or 0.23 $SB_{F=0}$ (from the median across the uncertainty grid) but PRI has not been determined. GSA2.2.3.1 indicates that in such cases (where B_{MSY} is analytically determined to be lower than 27%B_0 and there is no analytical determination of the PRI), the default PRI should be 75%B_{MSY}. This equates to 17% $SB_{F=0}$ (as the SC provides advice based on $SB_{F=0}$ rather than SB_0). The median estimate for $SB_{latest}/SB_{F=0}$ was 0.35 (range 0.26-0.49).

The assessment notes that fisheries data in general are very uninformative about SRR parameters and it is generally accepted that the steepness parameter, which controls the shape of the curve at lower stock sizes, is not well estimated in fisheries models. As for many other WCPFC stock assessments, a fixed value of steepness equal to 0.8 was assumed for the diagnostic case but alternative options of 0.65 and 0.95 were included in the structural uncertainty grid reflecting the wide range of plausible values for this parameter.

There are several additional aspects in the swordfish assessment which impact the confidence of its outputs concerning spawning potential:

- The longline-only nature of the fishery, catching mainly larger, older swordfish, means that it is not strongly informative with regards to recruitment dynamics.
- There are less substantial data inputs to the swordfish fishery assessment compared to the tropical tuna assessments.
- And a somewhat larger penalty on deviations from the stock-recruitment relationship was required for the swordfish assessment in order to have stable model behaviour, which means that assumptions about the stock recruitment relationship have a larger impact on the estimates of recruitment.

Nevertheless, the uncertainty grid examined the sensitivity of the assessment to a wide range of parameter settings and all of the model outputs produced estimates of stock size that were well above the default PRI. The lowest estimated value (0.26 of $SB_{F=0}$) is still well above the default PRI (0.17 $SB_{F=0}$). This provides evidence that there is a high degree of certainty that the stock is above the PRI.

This meets the requirements of the SG 60, SG 80 and the SG 100 levels.

	Stock status in relation to achievement of Maximum Sustainable Yield (MSY)			
b	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is **a high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		**Yes**	**No**

Rationale

The latest stock assessment (Takeuchi et al. 2017) also provides estimates of the level of spawning stock biomass relative to SBMSY.

- Biomass is estimated to have declined throughout the model period for all models in the grid, but the decline is particularly steep in the last 15 years.
- The median ratio of SB_{latest} to SB_{MSY} (based on SC preferred years of 2012-2015) was 1.85 (range 0.85-4.05, 11% of which were < 1.0) indicating that the stock is most likely to be still above levels that are consistent with MSY.
- There was an approximately 32% probability (23 out of 72 models) that the recent fishing mortality was above FMSY with $Prob((F_{recent}/F_{MSY})>1) = 0.32$ and the median estimate (0.86) was above that estimated from the 2014 assessment grid.

The ongoing downward trend in biomass, the level of uncertainty in the estimates of current biomass levels and concern that fishing mortality could still be too high reduces the confidence that the stock status is consistent with MSY.

This meets the requirements of the SG 80 level but not of the SG 100 level.

References

Takeuchi Y, Pilling G and Hampton J. (2017). Stock assessment of swordfish (*Xiphias gladius*) in the southwest Pacific Ocean. WCPFC-SC13-2017/SA-WP-13. https://www.wcpfc.int/node/29526

Stock status relative to reference points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	Level of spawning biomass in the absence of fishing ($SB_{F=0}$) Assumed PRI: 20% $SB_{F=0}$	Median estimate $SB_{latest}/SB_{F=0}$: 0.35 (range 0.26-0.49)	Above for all runs in uncertainty grid

Reference point used in scoring stock relative to MSY (SIb)	Level of spawning biomass in the absence of fishing ($SB_{F=0}$) Generic WCPFC objective: Level of spawning biomass relative to MSY (SB_{MSY})	Median estimate SB_{latest}/SB_{MSY}: 1.85, range 0.85 – 4.05, 10-90 percentile range 0.99 – 3.14.	Median estimate above, 11% of models below MSY
Overall Performance Indicator score		**90**	

PI 1.1.2 – Swordfish: Stock rebuilding – Not applicable

PI 1.1.2		**Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe**		
Scoring Issue		SG 60	SG 80	SG 100
a	Rebuilding timeframes			
	Guide post	A rebuilding timeframe is specified for the stock that is the **shorter of 20 years or 2 times its generation time**. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock.
	Met?	**NA**		**NA**
Rationale				

Not scored as the stock does not require rebuilding

b	Rebuilding evaluation			
	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is **evidence** that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.	There is **strong evidence** that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.
	Met?	NA		
Rationale				

Not scored as the stock does not require rebuilding

References

Overall Performance Indicator score	**N/A**

PI 1.2.1 – Swordfish: Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guide post	The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	**Yes**	**No**	**Not scored**
Rationale				

MSC defines a harvest strategy as 'the combination of monitoring, stock assessment, harvest control rules and management actions, which may include an MP or an MP (implicit) and be tested by MSE' (MSC – MSCI Vocabulary v1.1).

The original assessment scored the swordfish harvest strategy and control rules based on the Australian harvest strategy, but also took the WCPFC harvest strategy into account as necessary. As outlined in the background, the situation has now changed. The ETBF Harvest Strategy for swordfish is no longer used as the basis for setting the TACC for the Australian domestic fleet (of which the UoA is a part). Instead Australia has moved to an indicators-based approach similar to that used for albacore and yellowfin while a revised harvest strategy for the ETBF is being developed. This is expected to be in place in 2020. The indicators now used consider stock structure, results of the WCPO stock assessment, the regional stock assessment indicators, Region 1 catch, the ETBF proportion of the Region 1 catch, Region 1 spawning biomass, ETBF catch, ETBF standardised CPUE, ETBF fish weights, Australian State catches, Australian recreational catches, and the status of the stock in relation to the requirements of the Australian CHSP.

The advice from TTRAG to the AFMA Commission in 2018 provided detailed trends for this wide range of indicators but did not contain a clear preference for increasing or decreasing the TACC.

The TACC for 2019 was set by the AFMA Commission at 1,250 t, which represented a 93 t increase on that for 2018 (implemented as a 960 t TACC for a reduced 10 month season but equivalent to 1,157 t for a 12 month TACC). We have not seen the basis for the AFMA Commission decision to increase the TACC for swordfish but the evidence indicates that there is no longer a well-defined HCR in place for swordfish for the Australian component of the fishery. Nevertheless, given the types of indicators considered by the TTRAG and presented to the Commission we consider that a generally understood HCR remains in place that would act to reduce the TACC should the suite of indicators suggest the need to do so.

The overall harvest strategy for the UoA remains a combination of the measures applied by Australia and the WCPFC.

At the WCPFC level there remains no agreed workplan for the development of a Harvest Strategy for swordfish and CMM 2009-03 is still the effective management measure. The original assessment considered that CMM 2009-03 constituted the harvest strategy. We do not consider that this CMM contains sufficient measures to show how all the elements needed of a harvest strategy under MSC definitions are present and work together to achieve agreed objectives for the stock (the requirements at the SG80 level).

The original assessment also argued that for swordfish (unlike for the tunas) the harvest strategy that was in place for the Australian component of the fishery had sufficient leverage over total mortality of the stock to be an effective stock conservation measure. Given that this harvest strategy has been set aside and an indicators-based approach has been adopted, we consider that the harvest strategy for the swordfish fishery is now no more explicit than for the main WCPF tuna species (for which conditions are applied to this PI). And the ongoing uncertainty about the extent of mixing between the stock components fished by the Australian fleet and those found elsewhere in the South Pacific, undermines arguments about the leverage exerted by the Australian management system over the stock as a whole.

We agree with the original assessment that the combination of measures in place at the Australian and WCPFC levels is sufficient to expect that the stock management objectives would be met. But, particularly given the replacement of the ETBF harvest strategy, we do not consider the current harvest strategy for swordfish is responsive to the state of the stock with its elements demonstrably working together towards achieving stock management objectives, either at the Australian or WCPFC levels separately or collectively.

This meets the requirements of the SG 60 level but not of the SG 80 level.

	Harvest strategy evaluation			
b	Guide post	The harvest strategy is **likely** to work based on prior experience or plausible argument.	The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	**Yes**	**Yes**	**Not scored**
Rationale				

The harvest strategy is a combination of the measures contained in CMM 2009-03 and the indicators-based approach now used to set the TACC for the Australian domestic fleet. Neither approach has been tested. There is evidence of the performance of the previous combination of measures i from the 2017 stock assessment (Takeuchi et al. 2017). This estimated that the stock is likely not overfished and not subject to overfishing. This evidence suggests that the previous two harvest strategies were achieving their stock sustainability objectives. The move away from the ETBF-specific harvest strategy was made mainly because of concerns about its ability to achieve the economic objectives of this fishery. It is too early, however, to know the impacts of a change to an indicators-based approach for the ETBF for either sustainability or economic objectives. Nevertheless, given that this approach is only likely to be in place for a short time, we do not see it as likely to increase the risks to the stock.

This meets the requirements of the SG 60 and SG 80 levels.

	Harvest strategy monitoring			
c	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	**Yes**		
Rationale				

Monitoring in place for the fishery includes mandatory logbooks with records of catch and effort for each fishing operation, a VMS, tagging data, biological studies and port inspections. There is electronic observer coverage of 100% of fishing operations for the Australian domestic fleet, but limited observer coverage for the other fleets that catch swordfish. Catches by Australian vessels are monitored in close

to real time via electronic video surveillance, electronic log books, and processor declarations, to acquit individual quota allocations. Effort is also collated through a research project reporting to AFMA to provide CSIRO with data to evaluate standardised CPUE for the various size categories of fish, which is one of the stock status indicators used.

The combination of data streams support a sophisticated stock assessment process providing robust estimates of stock status that is sufficient to determine whether the harvest strategy is working.
This meets the requirements of the SG 60 level.

	Harvest strategy review			
d	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			**Not scored**
Rationale				

Not scored because not all SG80 requirements have been met.

At the time of preparation of this report, consideration was also being given to the reinstatement of the previous harvest strategy until the new one is developed. For scoring, the team will assess the arrangements in place at the time of the site visit.

	Shark finning			
e	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**NA**	**NA**	**NA**
Rationale				

Not be scored as sharks are not a target species.

	Review of alternative measures			
f	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	**NA**	**NA**	**NA**
Rationale				

Reported discards of swordfish for the UoA represented a very small component of the total catch.
Discarded catches of swordfish across the whole fleet are also likely to be minor.
The rules in place indicate that this scoring issue is not relevant to the UoA.

References

Takeuchi Y, Pilling G and Hampton J. (2017). Stock assessment of swordfish (Xiphias gladius) in the southwest Pacific Ocean. WCPFC-SC13-2017/SA-WP-13. https://www.wcpfc.int/node/29526

Tropical Tuna Resource Assessment Group Meeting minutes. https://www.afma.gov.au/fisheries/committees/tropical-tuna-resource-assessment-group

Overall Performance Indicator score	70
Condition number (if relevant)	7. By the third surveillance audit, demonstrate that the harvest strategy for swordfish is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. Consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.

PI 1.2.2 – Swordfish: Harvest control rules and tools

PI 1.2.2		**There are well defined and effective harvest control rules (HCRs) in place**		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	**Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	**Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time.
	Met?	**Yes**	**No**	**Not scored**
Rationale				

The original assessment scored the swordfish control rules based on the Australian HCR, but also considered WCPFC outputs as necessary. The current ETBF harvest strategy is being amended, and an indicators-based approach adopted for setting the TACC for the Australian fleet is in place. This involved the TTRAG providing the AFMA Commission with a suite of indicators and commentary on the implications of the TACC increasing, decreasing or remaining the same. The TACC for 2019 was set by the AFMA Commission at 1,250 t, which represented a 93 t increase on that for 2018 (implemented as a 960 t TACC for a reduced 10 month season but equivalent to 1,157 t for a 12 month TACC). We have not seen the basis for the AFMA Commission decision to increase the TACC for swordfish. There is no well-defined HCR in place for swordfish for the Australian component of the fishery. Nevertheless, given the types of indicators considered by the TTRAG and presented to the Commission we consider

that a generally understood HCR remains in place that would act to reduce the TACC should the suite of indicators suggest the need to do so.

The extent to which the Australian management measures control the exploitation rate across the whole stock depends on stock mixing rates. Currently, the view of the TTRAG and AFMA is that the management measures applied to the Australian fleet exert a significant level of control over the exploitation rate across the whole stock. There is ongoing uncertainty about the extent of mixing between the stock components fished by the Australian fleet and those found elsewhere in the South Pacific. This means that, although measures by Australia would be expected to reduce exploitation rates if necessary, it is not clear that they would have sufficient leverage to ensure that the stock as a whole would be maintained at levels consistent with MSY.

In the case of the WCPFC, the MSY targets of management imply that limit reference points will be avoided. However, this is only generally understood and there are no well defined HCR contained with CMM 2009-03 or other management arrangements.

This meets the requirements of the SG 60 level but not of the SG 80 level.

	HCRs robustness to uncertainty			
b	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.
	Met?		**No**	**Not scored**
Rationale				

The previous ETBF harvest strategy for swordfish had been MSE tested and was believed to be robust to assumptions about mixing rates and sources of uncertainty. The recent rejection of this harvest strategy indicates that the testing was not able to predict its performance in reality.

There remains only a generally understood HCR for the Australian fleet that has not been subject to any form of testing and whose ability to manage the exploitation for the whole stock is contingent will depend on uncertain rates of mixing.

There is no HCR for the remainder of the swordfish fleet that operate under WCPFC rules.

Therefore, it could not be said that the HCRs for swordfish are robust to the main uncertainties. This does not meet the requirements of the SG 80 level.

	HCRs evaluation			
c	Guide post	There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation.	**Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	**Yes**	**No**	**Not scored**
Rationale				

For the Australian fleet, the main tool used to implement the HCR is the TACC, backed with an MCS system that minimises the opportunities for non-compliance with the quotas allocated.

For the remainder of the WCPFC's fleet, there is no HCR and therefore no tools in use implement one.

The 2017 stock assessment estimated that the stock remains at or above a level that is consistent with MSY. Nevertheless, this is not good evidence of the ability of the revised Australian management system to unilaterally maintain exploitation levels at required levels. Particularly as this assessment only used data up to 2015 and the form of the harvest strategy changed in 2018. The effectiveness of the new indicators-based approach with its generally understood HCR is yet to be determined.

This meets the requirements of the SG 60 level but not of the SG 80 level.

At the time of preparation of this report, consideration was also being given to the reinstatement of the previous harvest strategy until the new one is developed. For scoring, the team will assess the arrangements in place at the time of the site visit.

References	
Overall Performance Indicator score	**60**
Condition number (if relevant)	8. SI a) By the third surveillance audit, demonstrate that well defined HCRs are in place for swordfish that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. SI b) By the third surveillance audit, provide evidence that the selection of the harvest control rules for swordfish are robust to the main uncertainties. SI c) By the third surveillance audit, provide evidence that indicates that the tools in use for swordfish are appropriate and effective in achieving the exploitation levels required under the harvest control rules. Consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.

PI 1.2.3 – Swordfish: Information and monitoring

PI 1.2.3		**Relevant information is collected to support the harvest strategy**		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data are available to	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information

			support the harvest strategy.	such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	**Yes**	**Yes**	**No**
Rationale				

Stock structure: Extensive tagging and genetic information is available as described in the background.

Stock productivity: There are various sources of information on growth, reproduction and mortality.

Fleet composition: The various fleets operating on the stock(s) and their characteristics are well known and are described in the stock assessment.

Stock abundance: The key input into the stock assessment are the standardised CPUE trends, which are available from the ETBF (standardised by time, area, operational parameters and environmental factors), New Zealand (standardised likewise) and other fleets (the EU, Japan, Taiwan, Korea and the USA – standardised in less detail).

Fishery removals: Landings by vessel in the ETBF are closely tracked and cross-checked from processor reports, in order that the ITQ system can be enforced. Discards are monitored by electronic monitoring for the ETBF.

Catches by the other fleets are reported to WCPFC, including historical catches.

Environmental information: As noted above, Australian and New Zealand catch and effort data can be standardised by environmental variables, which are recorded in logbooks. Some tagging work can also record environmental variables directly. The migrations of the fish in relation to ontogenetic and environmental factors can also be inferred to some extent by the distribution of catches of fish of different size, sex, reproductive condition etc. This information is reviewed in the stock assessment.

Although the harvest strategy for the Australian fishery is under review, the range and quality of information available was sufficient to support the previous version and would also be sufficient to support a revised version which is being developed and tested on this information base. This meets SG 60 and SG 80 requirements.

But given the significant uncertainties in species biology and that the Australian harvest strategy being under review, SG100 is not met.

b	Monitoring			
	Guide post	Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	**Yes**	**Yes**	**No**

Rationale

There is a wide range of indicators used in the indicators-based approach now in place for the Australian fleet. These indicators are based on data that are collected from all fishing activity and are based on a monitoring system with the same accuracy and coverage as previously. They do support what is considered to be a generally-understood HCR.

For the non-ETBF fisheries, data are provided to WCPFC at varying levels of detail (operational by the EU and New Zealand as well as Australia, aggregated by the Asian nations). On this basis, SG80 is met.

Significant uncertainties remain in some key data sets that inform the WCPFC stock assessment and are key uncertainties with the Australian HCR – notably in relation to the basic biology of the species. Furthermore, the connectivity of the various (sub) populations remains somewhat unclear. Both these issues have impacts on the uncertainty of the stock assessment and the robustness of the management to this uncertainty.

This meets the requirements of the SG 60 and SG 80 levels but not of the SG 100 level.

c	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		**Yes**	
Rationale				

All the key fisheries on the stock provide catch data to WCPFC, which is incorporated into the stock assessment. As far as SPC scientists are aware, there are no significant fisheries missing from the assessment, although historical data sets are more uncertain than recent data. Recreational catches of swordfish in Australia are not reported to be an issue for the assessment, according to AFMA.
This meets the requirements of the SG 80 level.

References	
Overall Performance Indicator score	**80**

PI 1.2.4 – Swordfish: Assessment of stock status

PI 1.2.4	**There is an adequate assessment of the stock status**		
Scoring Issue	SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration		
	Guide post	The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?	**Yes**	**No**
Rationale			

SPC periodically carries out a full stock assessment on behalf of WCPFC – most recently in 2017. For the Australian fleet, the assessment now takes the form of a review of indicators (including the results

of the most recent stock assessment) and the harvest control rule is generally understood. This approach was used for the first time to set the TACC in 2019 and presumably the process will be followed annually. It is the same process used for the assessment of all key target fish in the ETBF
The periodic integrated stock assessments do consider a range of uncertainties, which takes into account the details of various different fisheries (via standardisation of their CPUE trends). A key axis of uncertainty in the 2013 assessment – growth – has been reduced in the current assessment through the results of new growth studies (Farley et al. 2016). Further developments flagged in the 2017 assessment include to MFCL to enable the sex-disaggregated assessment of this stock (given the data available), enhancement of sex-separated data collection, investigations into potential stock structure, further analysis of the size data available, and consideration of additional data required to enhance CPUE standardisation given the decline in fishing by key long-term fleets within the SWP.

The indicators-based approach now used by Australia, also considers the major features relevant to the biology of the stock. This will presumably be done more frequently than the periodic stock assessments but is done in a much less structured way.

Aspects of the assessment have improved since the original assessment assigned a score of 80 for this PI. Nevertheless, other uncertainties about the species, the removal of the Australian empirical form of assessment from its management system, and the ongoing lack of any HCR for the remainder of the Western and Central Pacific Ocean fishery means that a higher score is still not warranted.
This meets the requirements of the SG 80 level but not of the SG 100 level.

	Assessment approach			
b	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	**Yes**	**Yes**	
Rationale				

The stock assessment estimates stock status in relation to MSY reference points and reference points relating to the situation in the absence of fishing (e.g. B_0, $B_{current}$,F=0). This assessment and the parameters of management interest it generates are appropriate to the stock and can clearly be estimated meeting the requirements at the SG 80.

Previously, the fishery had a condition under PI 1.1.2 of v1.3 of the FCR because that performance indicator required explicit target and limit reference points to have been adopted. There is no equivalent requirement in this scoring issue. Reference points are needed for the effective performance of a HCR and a condition remains for PI 1.2.2 that in part reflects the absence of explicit reference points.

One indicator in the Australian approach continues to be the CPUE of different size components of the catch but the rejection of the previous HCR reflects the view of TTRAG that this no longer provides a reliable indicator of stock status relative to any specific reference points. This does not add to meeting scoring requirements.

	Uncertainty in the assessment			
c	Guide post	The assessment **identifies major sources** of uncertainty.	The assessment **takes uncertainty into account**.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

The stock assessment attempts to reduce uncertainties and biases in input data sets (e.g. via stratification in space and time, and via standardisation using GLM). It also includes a detailed exploration of uncertainties in the model assumptions, via sensitivity analyses for various different model options (growth and mortality schedules, steepness, connectivity patterns and different treatment of the CPUE data set). The model uses a statistical framework to estimate states and parameters conditional on a suite of structural assumptions and the data. The model outputs the best (Maximum Posterior Density) point estimates, along with estimates of uncertainty for desired parameters. The most recent assessment emphasizes the uncertainty in point estimates conditional on a broad range of alternative fixed assumptions, rather than the parameter estimation uncertainty estimated conditional on individual models. As a consequence, the probabilistic stock status statements do not have the classical probabilistic interpretation but are actually expected to provide a broader and more realistic representation of uncertainty than classical approaches. SG100 is met.

	Evaluation of assessment			
d	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			**Yes**
Rationale				

There is an ongoing program of review of assessment assumptions and approaches by the staff in the SPC-OFP. Alternative hypotheses are continually being explored (within funding and time constraints) and assessments are updated and modified as required.

Model structure has been updated to reflect the availability of new data or new interpretations of existing data and a suite of sensitivity analyses have been undertaken to explore the impact of options such as changing assumptions for fixed parameters or different treatments of the data. Furthermore, likelihood profiles and retrospective analyses have been undertaken to explore any systematic biases in the model and the results used to select what is now termed the diagnostic case.

The assessment has been tested using a systematic exploration of the interactions among different sets of assumptions producing a grid of models for the formulation of management advice. This confirms that alternative hypothesis and assessment approaches have been rigorously explored

This meets the requirements of the SG 100 level.

	Peer review of assessment			
e	Guide post		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		**Yes**	**No**
Rationale				

The WCPFC stock assessment is carried out by SPC and reviewed by the Scientific Committee of WCPFC – this counts as internal review. Some WCPFC stock assessments have been externally reviewed, but not the swordfish stock assessment as far as we are aware. Some findings of the external reviews of the assessments of other WCPFC species have been incorporated into the swordfish assessment (such as placing only a small penalty on deviations from the stock-recruitment relationship) but this is not considered to be sufficient to equate to an external review.

This meets the requirements of the SG 80 level but not of the SG 100 level.

References	
Overall Performance Indicator score	**90**

Principle 2

7.2.4 Principle 2 background

The aquatic ecosystem

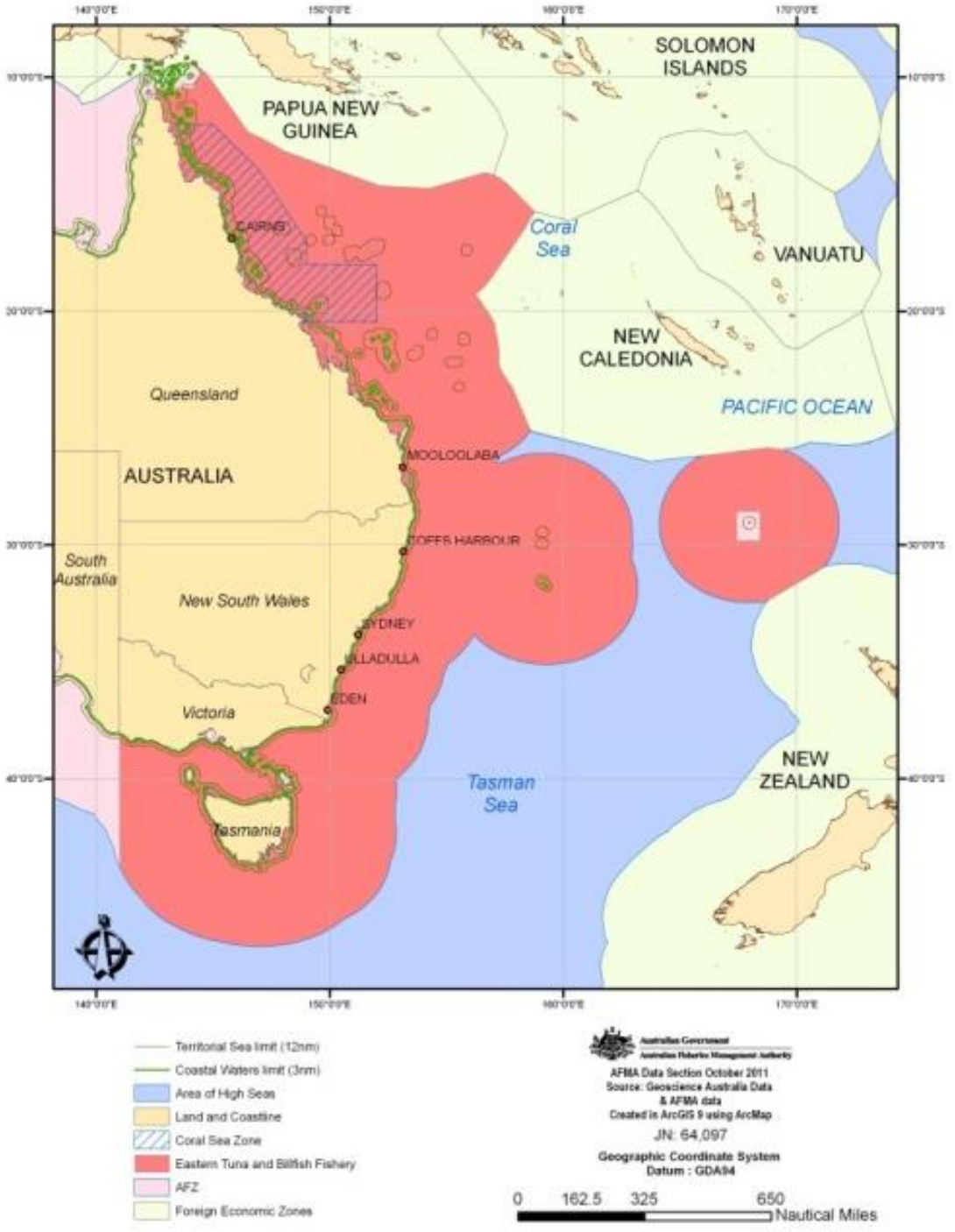

Figure 30. The area of operation of the ETBF.
Source: https://www.afma.gov.au/fisheries/eastern-tuna-and-billfish-fishery-page.

Inside the Australian Fishing Zone, the ETBF operates from Cape York in the north, to the border of South Australia and Victoria in the south. It extends to the EEZ limit (and includes the waters around Norfolk Island) (Figure 30). A small amount of fishing is conducted in the adjacent high seas by ETBF vessels (less than 2% of the catch of any target species annually (Australian Government 2019)). The East Australia Current (EAC) is a key oceanographic feature in this area, flowing north to south and giving rise to three other currents which flow very broadly east. Eddies and nutrient-rich upwellings occur along the EAC, e.g. around seamounts. Temporal variation in the EAC occurs as a result of the El Niño Southern Oscillation. The fishery co-occurs with a diversity of marine species, including non-target primary and secondary species, and ETP (see below).

Direct take of catch has been identified as the ETBF's main influence on the ecosystem (Commonwealth of Australia 2014). Ecosystem modelling has found that increasing fishing effort had minor effects on other ecosystem components (Young et al. 2009). This was accounted for by the similar trophic positions of most predators (i.e. if one predator species became less abundant, the impacts of another would increase as a consequence).

There are some areas that are closed to pelagic longline fishing. These include AFMA-managed areas[2], and closures made under other legislation (e.g. marine reserves)[3].

The ETBF is considered to be moderately sensitive to climate change, based on the behaviour of the target species (CSIRO 2018). The ecosystem impacts of climate alone, and of fishing and climate change together, have been modelled. On its own, climate change was predicted to result in increased prey biomass (squids) and tropical lobsters (Young et al. 2009; Fulton et al. 2018) in the ETBF area. The increase in prey biomass was linked to increased predator abundance (Young et al. 2009). Together, fishing and climate change in the region where the ETBF occurs were predicted to result in decreases of some species (e.g. mako sharks, turtles, benthic sharks, and seabirds) and increased biomass of others (e.g. pelagic sharks, marlin, small toothed whales and large planktivorous fish) (Fulton et al. 2018). The predicted effects of the ETBF fishery specifically, and climate change, were decreases in the biomass of all species and species groups considered (Fulton et al. 2018). Modelling predicted larger proportionate changes in biomass when ETBF fishing and climate change were considered together. The predicted effect of the fishery was generally slightly stronger than climate change alone (Fulton et al. 2018).

The ecological risk assessment

The impacts of the ETBF on habitats, communities and species are evaluated using a risk assessment approach (AFMA 2017b). This approach is a key part of AFMA's progression towards ecosystem-based fisheries management. Risk assessments may be qualitative through to semi- or fully quantitative and are also effective in highlighting species for which are data deficient. The primary objectives of the ecological risk management (ERM) framework are to ensure that fishing in Australia's Commonwealth commercial fisheries does not reduce species to (or below) a level at which the probability of recruitment failure is unacceptably high. Where such impacts have occurred, the objective is to restore species status to above that level. Commercial, bycatch and protected species are assessed using the ERM (AFMA 2017a).

An initial ecological risk assessment conducted for the ETBF incorporated 390 species, 274 habitats and 64 communities (AFMA 2008). Among this group, 34 species were initially identified as high risk. A residual risk assessment (considering fishery management arrangements and additional information) refined this initial result to five species. Changes to the risks assessed resulted from considering the fishery management measures in place and a lack of observed interaction with the ETBF (AFMA 2008). The ETBF was determined to present low risk to habitats, and these were eliminated from further assessment steps (AFMA 2008). A second risk assessment conducted in 2012 identified nine species relevant to the ETBF as high or precautionary high risk (AFMA 2012).

An updated risk assessment conducted using ETBF data collected 2011 to 2015, found that the risks to species from ETBF fishing activity had reduced overall (Sporcic et al. 2019). In that assessment, 267 species were considered. The reduction in species compared to the 2008 assessment was due to a refined focus on species interacting with the ETBF. Eight species were identified as being at high risk in the updated assessment. These were:

[2] https://www.afma.gov.au/sustainability-environment/fishing-closures
[3] https://parksaustralia.gov.au/marine/parks/

- Dusky whaler *Carcharhinus obscurus,* for which risk was reduced to medium-low, based on consideration of post-mortality capture estimates
- Largetooth cookiecutter shark *Isistius plutodus* and brier shark *Deania calceus*: reduced to low risk based on known interaction rates
- Indian Ocean bottlenose dolphin *Tursiops aduncus*, bottlenose dolphin *Tursiops truncatus*, Risso's dolphin *Grampus griseus*, Longman's beaked whale *Indopacetus pacificus* and pygmy killer whale *Feresa attenuate*, which were reduced to low risk based on low levels of reported interactions.

Overall, after the residual risk analysis was conducted, there were no species remaining in the high risk category.

Similar to the initial 2008 assessment, habitats were not considered to be beyond low risk in the most recent assessment. The fishery operates in pelagic waters, with gear set from 30 – 500 m (Sporcic et al. 2019). The gear does not reach the sea floor or make contact with benthos during fishing operations.

The introduction of pathogens through the use of imported bait is considered a major risk to the communities where the ETBF occurs (Sporcic et al. 2019). Rationale for identifying this risk includes the introduction of a previously unknown virus into the Australian *Sardinops* population. Imported *S. sagax* used to feed caged southern bluefin tuna was identified as a potential source and mass mortalities of 60-70% of the spawning biomass of *S. sagax* occurred (Gaughan 2002).

The ecological risk assessment also recognised the cumulative risk of impacts from other fisheries operating in the same area as the ETBF.

Primary and secondary species

Catch composition

Approximately 80 primary and secondary species or species groups are identified in ETBF logbook information (Table 17). Around 70 of these comprised less than 1% of total catch on average, for the fishing years 2016-2018. Among primary and secondary species, only southern bluefin tuna comprised more than 10% of annual catch on average. Blue sharks comprised 9% of catch. Six species were represented at 1 – 3.5% of average annual catch (in descending order): striped marlin, ocean sunfish, mahi mahi, bronze whaler, short sunfish (and shortfin mako, discussed under ETP below).

Southern and northern bluefin tuna, and striped marlin are categorised as primary species for this assessment (Table 18). Southern bluefin tuna and striped marlin are assessed as main, due to their catch volumes and vulnerability. Northern bluefin tuna are minor, comprising less than 0.05% of the catch. Blue shark and ocean sunfish were identified as main secondary species, based on catch volumes and vulnerability. The remaining secondary species are minor (Table 18).

Logbook information is verifiable. Electronic monitoring and human observer coverage are used to monitor fishing activities at sea (AFMA 2019). Electronic monitoring covers 100% of fishing operations. There is a baseline level of 10% review of imagery. When an ETP species is reported in a fisher's logbook, 100% of imagery is reviewed.

Management of primary and secondary species

The initial ERM risk assessment process resulted in dusky whalers being assigned a high-risk score (AFMA 2008). Misidentification of these sharks as bronze whalers was considered likely, resulting in a greater actual risk than perceived based on consideration of logbook records. A subsequent iteration of the risk assessment in 2012 identified crocodile shark, pelagic thresher (*Alopias pelagicus*), ocean sunfish and short sunfish as "precautionary high risk". Dusky whaler continued to be assessed as high risk (AFMA 2012). In the 2018 risk assessment update, there were no primary or secondary species considered to be at high risk after the residual risk analysis was conducted (Sporcic et al. 2019). In general, the introduction of new (additional) management measures to reduce catch is considered when a species scores "high" in the risk assessment after the residual risk analysis has been conducted.

Management measures in place for primary and secondary species, except bait species, are described in Table 18. Among these primary species, southern bluefin tuna is fished as a target species at times, in accordance with the Southern Bluefin Tuna Fishery Management Plan 1995. Management tools and measures are in place that are intended to achieve a stock management objective reflected in a target reference point (MSC 2018, paragraph SA3.1.3). The target reference point invoked is the interim rebuilding target for southern bluefin tuna. This target is to rebuild the stock to 20% of its original spawning stock biomass by 2035 (CCSBT 2018). The southern bluefin tuna stock is at a level below PRI (Table 18; CCSBT 2018).

Southern bluefin tuna could also be evaluated as an ETP species for this assessment; it is listed as Conservation Dependent on the EPBC Act. It is evaluated as a primary species rather than ETP in this assessment because the southern bluefin tuna fishery is declared to be an approved wildlife trade operation under the EPBC Act. This declaration remains in force until 11 November 2022. Under the EPBC Act, there is no adopted recovery plan or threat abatement plan for this species. However, approval as a wildlife trade operation includes the requirement to adhere to the Southern Bluefin Tuna Fishery Management Plan 1995 in force under the Fisheries Management Act 1991[4]. In addition, recovery objectives apply at the RFMO (CCSBT) level for this species.

Management of striped marlin (a primary main species) is focused on limiting catch with a TACC. A revised harvest strategy is currently in preparation, which will reflect the findings of the 2019 assessment of the southwest Pacific stock of this species (Table 18, Ducharme et al. 2019).

There are no species-specific management measures in place for the blue shark, a secondary main species. However, management measures that apply to shark catch include an overall limit of 20 on the number of sharks that may be retained per trip (AFMA 2008, 2019). This limit was not derived scientifically and is not constrained by a limit on the number of trips that may be undertaken. Wire traces were prohibited in the ETBF in 2005, after research conducted of north-eastern Australia found that shark catch rates were 30% lower gear fitted with monofilament instead of wire traces (AFMA 2008). At the RFMO-level, WCPFC CMM 2014-05 sets out measures to reduce the impact of tuna and billfish fisheries on sharks, including the prohibition of wire branch lines. These measures also apply to other shark species, such as those assessed as secondary minor species (Table 18).

Operational measures that apply to the ocean sunfish (a secondary main species), and together comprise a partial strategy, include that almost all catch of this species is discarded, with pre-release handling required to promote post-release survival. Excluding bait species and recognising the measures set out for sharks as above, there are catch limits or prohibitions on retention in place for 12 other secondary minor species or species groups (Table 18).

All primary and secondary species returned to the sea as unwanted catch must be handled and released such that post-capture survival is promoted (AFMA 2019).

Bait

Bait species were categorised as primary main and minor, and secondary minor (Table 19). Squid and a variety of fish baits are used. By volume, the Argentine squid is the dominant bait species and is designated as main. All other bait species are considered minor and comprise less than 3% of the total catch in all years. Management approaches vary among bait stocks (Table 19).

Unwanted catch

Unwanted catch comprised 27% of total catch weight on average for the years 2016-2018. Discards of target species comprised an average of around 2.5% of the unwanted catch. Almost all sharks, skates and rays were discarded, except for the mako sharks (discarded proportionately less than other shark species (Table 17)). Blue and black marlin were also discarded as required by law (AFMA 2019). Mahi mahi and wahoo were consistently retained (Table 17). In addition to a complete prohibition on landing some species, there are species-specific landing limits in place for others (Table 18; AFMA 2019).

[4] https://www.legislation.gov.au/Details/F2019N00091 [Accessed 15 May 2020]

ETP

ETP species interacting with the fishery include seabirds, marine mammals, marine turtles and protected fish species (e.g. some sharks). Several mechanisms designate species as ETP in this fishery. Most species are listed by the Environment Protection and Biodiversity Conservation Act 1999. Some are also identified in international agreements, e.g. the Agreement on the Conservation of Albatrosses and Petrels. ETP species are listed and their legal and conservation status, population trends and threats summarised in Table 20 to Table 23.

Interactions with protected species that occur in the course of fishing must be reported by law. This requirement can be met by recording the interaction in a logbook (AFMA Daily Logbook or electronic logbook equivalent). "Interaction" is defined as an encounter between a protected species and a fishing vessel, fishing gear, or fishers, that causes the animal death, injury or stress. The definition includes captures and entanglement in fishing gear, and collisions (e.g. vessel strike). When protected species are released (or discarded) after capture, this must be done in full view of the electronic monitoring camera system. It is not illegal to interact with a protected species in the course of fishing, if reporting requirements and other fishing-related regulations are met (AFMA 2019).

The initial ERM risk assessment process resulted in longfin mako sharks, short-finned pilot whale, false killer whale and leatherback turtle being assigned a high-risk score. Twenty-two ETP species were assessed as medium risk (AFMA 2008). The subsequent assessment in 2012 identified longfin mako as "precautionary high risk" and short-finned pilot whale, false killer whale and leatherback turtle as high risk (AFMA 2012). In the 2018 assessment, no ETP species retained a high-risk score after the residual risk analysis process (Sporcic et al. 2019).

Mandatory seabird bycatch mitigation measures apply in the ETBF (AFMA 2019). These include carrying at least one assembled tori line onboard fishing vessels and not discharging offal (fish waste) while setting. South of latitude 25°, three mandatory seabird bycatch mitigation measures apply:

- A tori line that meets certain specifications must be deployed when longline setting occurs between nautical dawn and nautical dusk. (When setting is conducted dusk to dawn, a tori line is not required).
- Non-frozen bait must be used.
- Longlines must be weighted with at least one of the following:
    - 60g swivels $\leq$ 3.5m from each hook
    - 98g swivels $\leq$ 4m from each hook
    - 40g weights immediately adjacent to the hook, or $\leq$ 0.5m from the hook, with dead, non-frozen baits attached to the hooks
    - "hook shielding device" with a cap and weighing at least 38g deployed directly at the hook.

The Threat Abatement Plan (TAP) for seabirds specifies that the rate of seabird bycatch must not exceed 0.05 birds/1,000 hooks in all areas (defined by 5-degree latitudinal bands) and all season. The TAP sets out actions that occur if this catch rate is exceeded (Commonwealth of Australia 2018). In 2020 the ETBF permit conditions relating to seabirds changed, such that stepwise escalating bycatch mitigation requirements were introduced. The new requirements reference previous seabird catch rates and mitigation requirements that apply when specified triggers are breached. Through these measures, vessel-specific management requirements for seabird bycatch are implemented.

WCPFC requirements to mitigate the impact of fishing on seabirds are set out in CMM 2018-03.

Mandatory measures are also in place to reduce the impacts of this fishery on marine turtles (AFMA 2019). These include:

- Use of large circle hooks on all shallow sets
- Carrying at least one dehooking and one line-cutting device onboard, both of which must meet required specifications.

WCPFC CMM 2008-03 provides for RFMO-level measures to reduce the capture and mortality of sea turtles (e.g., the requirement to carry dehookers and line-cutters). CMM 2008-03 will be superseded by CMM 2018-04 on 1 January 2020.

Retaining catches of longfin mako, shortfin mako and porbeagle sharks is illegal except in certain circumstances. Requirements specific to these species include the following (AFMA 2019):

- All sharks of these species must be returned to the water when they show any signs of life
- These sharks may only be retained when they are dead on the line
- All live and dead captures of these sharks must be recorded.

As described above, there is a per-trip limit in place for sharks, and the use of wire traces is prohibited in the fishery. Unless other more specific management measures apply, shark take in excess of the number of tuna and billfish quota species taken per trip is not permitted.

WCPFC CMMs also apply to oceanic whitetip and silky sharks. CMM 2011-04 prohibits the landing and retention of oceanic whitetip sharks and requires their timely release with minimal harm. Under specified circumstances, observers may collect biological samples from oceanic whitetips that are dead at the haul. CMM 2013-08 sets out these provisions for silky sharks. More broadly, CMM 2014-05 sets out measures intended to reduce the impact of tuna and billfish fisheries on sharks, including the prohibition of wire branch lines.

Australia has developed its second national plan of action for sharks (DAFF 2012), which is relevant to the provisions of WCPFC CMM 2010-07.

Habitats

The ERA developed for this fishery assessed the risk of fishery impacts on habitats as low (AFMA 2008). The fishery operates in pelagic waters, and gear is not expected to contact the sea floor. Therefore, there are no known impacts on benthos including Vulnerable Marine Ecosystems. A schematic of gear set-up is shown in Figure 31.

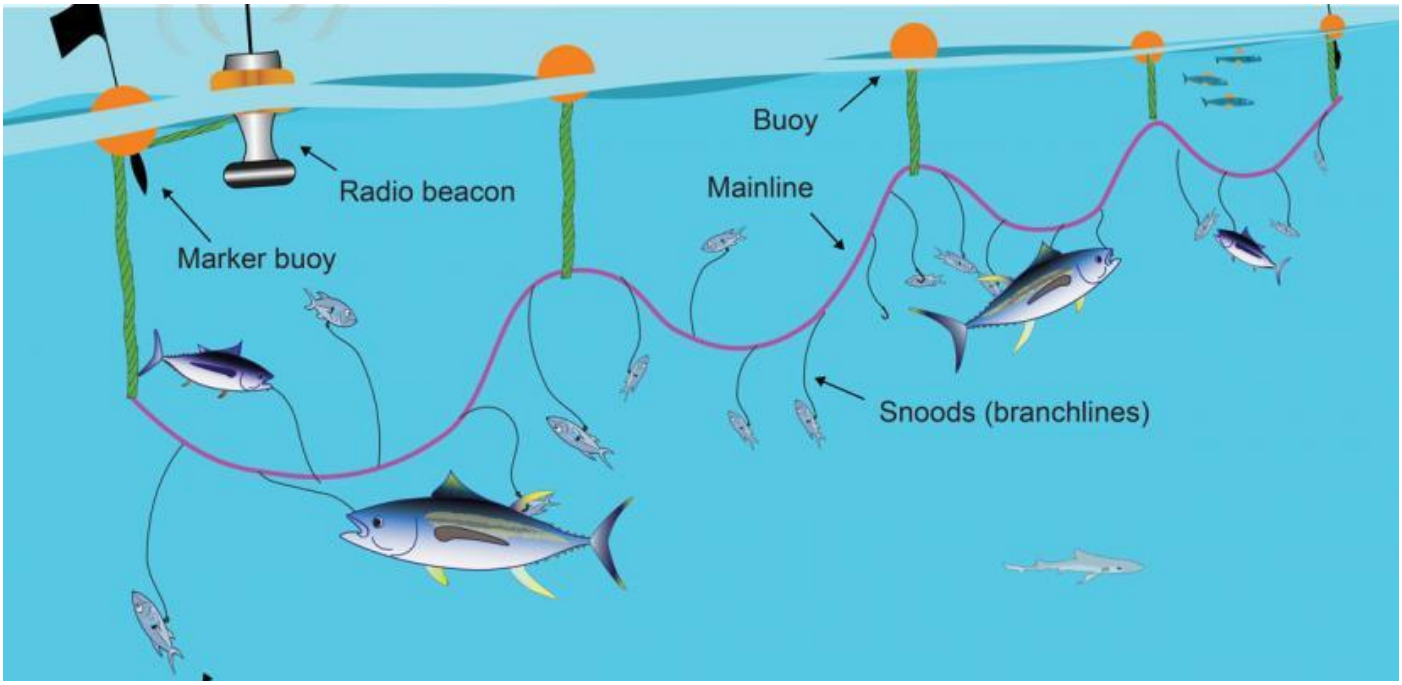

Figure 31. A schematic of pelagic longline fishing gear.

Source: www.afma.gov.au/fisheries-management/ methods-and-gear/longlining [Accessed 7 November 2019].

Table 17. Composition of non-target species catch, as a percentage of total catch for 2016-2018 and average percentage of each species' catch discarded during that period. Catch data sourced from vessel logbooks.

Common name	Scientific name	2016	2017	2018	% dis
Australian bonito	*Sarda australis*	0	0.0003	0.003	0.0
Barracouta	*Thyrsites atun*	0.08	0.12	0.07	100.0
Bigscale pomfret	*Taractichthys longipinnis*	0.0002	0.00003	0.00008	0.0
Black marlin	*Makaira indica*	0.94	0.88	0.89	100.0

Common name	Scientific name	2016	2017	2018	% dis
Blacktip shark	*Carcharhinus, Loxodon, Rhizoprionodon* spp.	0.0003	0.001	0	0.0
Blue marlin	*Makaira nigricans*	0.99	0.87	0.86	100.0
Blue shark	*Prionace glauca*	7.87	10.42	9.45	100.0
Broadnose shark	*Notorynchus cepedianus*	0	0	0.005	100.0
Bronze whaler	*Carcharhinus brachyurus*	0.82	2.39	2.22	99.7
Butterfly mackerel	*Gasterochisma melampus*	0.003	0.006	0.00009	33.3
Cardinalfish	Apogonidae, Dinolestidae	0.0002	0	0	40.0
Cobia	*Rachycentron canadum*	0	0.002	0	61.6
Crocodile shark	*Pseudocarcharias kamoharai*	0.006	0.02	0.02	100.0
Dusky whaler	*Carcharhinus obscurus*	0.37	0.7	0.78	97.4
Eastern orange perch	*Lepidoperca pulchella*	0.002	0	0	0.0
Escolar	*Lepidocybium flavobrunneum*	0.3	0.33	0.49	34.4
Frostfish	*Lepidopus caudatus*	0.0002	0.0001	0.0002	100.0
Giant manta	*Mobula (Manta) birostris*	0.23	0.18	0.27	100.0
Gulper or sleeper sharks, dogfish	Centrophoridae, Dalatiidae, Squalidae, Somniosidae, Etmopteridae	0.02	0.01	0.003	100.0
Hammerhead sharks	Sphyrnidae	0.14	0.27	0.31	99.0
Lancetfish	Alepisauridae	0.56	0.73	0.6	99.9
Largehead hairtail	*Trichiurus lepturus*	0.0002	0	0	0.0
Lemon Shark	*Negaprion acutidens*	0	0	0.00002	0.0
Longfin mako	*Isurus paucus*	0.006	0.01	0.008	81.1
Mahi mahi	*Coryphaena hippurus*	2.59	2.34	2.09	3.2
Marlin, sailfish or spearfish	Istiophoridae	0.01	0.05	0.1	97.6
Moonfish	*Lampris guttatus, Lampris immaculatus*	0.23	0.11	0.22	3.0
Northern bluefin tuna	*Thunnus orientalis*	0.01	0.01	0.03	0.0
Oarfish	*Regalecus glesne*	0.004	0.007	0.003	95.5
Ocean sunfish	*Mola mola*	2.16	3.14	3.98	99.9
Oceanic whitetip shark	*Carcharhinus longimanus*	0.48	0.58	0.39	99.9
Oilfish	*Ruvettus pretiosus*	0.0005	0.003	0.005	86.9
Pilotfish	*Naucrates ductor*	0	0	0.00003	100.0
Pomfret	Bramidae	0	0	0.0005	0.0
Porbeagle	*Lamna nasus*	0	0.06	0.002	74.4
Porcupine fish	*Diodontidae*	0	0.0004	0.0008	100.0
Rainbow runner	*Elagatis bipinnulata*	0.0002	0.001	0	39.2
Ray's bream	*Brama brama*	0.16	0.29	0.35	34.9
Rudderfish	*Centrolophus niger*	0.92	0.77	0.78	13.7
Sailfish	*Istiophorus platypterus*	0.03	0.06	0.03	33.4
Sandbar shark	*Carcharhinus plumbeus*	0.00006	0	0	100.0
Sharks (mixed)		0.42	0.6	0.23	100.0
Short sunfish	*Mola ramsayi*	0.52	2.12	1.43	100.0
Shortbill spearfish	*Tetrapturus angustirostris*	0.22	0.2	0.2	7.1
Shortfin mako	*Isurus oxyrinchus*	1.14	1.31	1.14	65.7
Silky shark	*Carcharhinus falciformis*	0.06	0.15	0.06	100.0
Silver trevally	*Pseudocaranx georgianus*	0	0.00007	0	0.0
Skates and rays		0.01	0.02	0.01	100.0
Skipjack	*Katsuwonus pelamis*	0.12	0.47	0.25	78.8

Common name	Scientific name	2016	2017	2018	% dis
Smalltooth cookiecutter shark	*Isistius brasiliensis*	0.0004	0.0003	0.0004	100.0
Smooth hammerhead	*Sphyrna zygaena*	0.01	0.06	0.02	100.0
Snake mackerel	*Gemphylus serpens*	0.13	0.3	0.04	99.9
Snapper	*Chrysophrys auratus*	0	0.0001	0	0.0
Southern bluefin tuna	*Thunnus maccoyii*	9.93	9.46	15.61	8.7
Southern ribbonfish	*Trachipterus arawatae*	0	0.00001	0.00002	100.0
Squid	Teuthoidea	0	0	0.00002	0.0
Stingrays	Dasyatidae	0.04	0.04	0.07	100.0
Striped marlin	*Kajikia (Tetrapturus) audax*	3.26	3.66	3.4	3.5
Thresher shark	*Alopias vulpinus*	0.65	0.74	0.88	99.8
Tiger shark	*Galeocerdo cuvier*	0.62	0.75	0.91	99.7
Toadfish	Tetraodontidae	0.001	0.008	0.004	100.0
Trevallies and Scads	Carangidae	0	0.001	0.0002	100.0
Tuna (mixed)	Scombridae (tribes Sardini and Thunnini)	0	0.00002	0.003	100.0
Unidentifed fish (including mixed reef fish)		0.0003	0.0002	0.0004	95.1
Wahoo	*Acanthocybium solandri*	0.32	0.28	0.24	3.0
Whaler and weasel sharks	Carcharhinidae, Hemigaleidae	0.08	0.02	0.06	100.0
Whitetip reef shark	*Triaenodon obesus*	0.007	0.04	0.06	100.0
Yellowtail kingfish	*Seriola lalandi*	0.00006	0.0006	0.0003	0.0
Total catch (including target species, kg)		6640794	6866097	6372589	
Species captured, including out of scope species, enumerated and discarded (weights unavailable)					
Cormorant					
Gemfish	*Rexea solandri*		1		
Mackerel	Scombridae (tribes Scomberomorini and Scombrini)		22		
Longtail tuna	*Thunnus tonggol*		1		
Mackerel tuna	*Euthynnus affinis*		1		
Stargazers	*Uranoscopidae*		1		
Wobbegongs, blind, nurse, carpet and zebra sharks	*Brachaeluridae and related families*		1		
Bull shark	*Carcharhinus leucas*			1	
Conger eels	Congridae, Colocongridae				
Ghostsharks	Chimaeridae			3	
Silver warehou	*Seriolella punctata*			1	

Cumulative impacts from overlapping UoAs

Overlapping UoAs include the Australian blue grenadier (*Macruronus novaezelandiae*) trawl fishery, and the tuna fisheries listed below. Across these fisheries, there were no cumulative impacts to consider. This was because there were no shared primary or secondary main species, and no international or national limits for ETP species occurring among UoAs. The ETBF operates in pelagic waters and does not contact benthic habitats, therefore there are also no cumulative habitat impacts to consider.

Tuna fishery assessments relevant to the consideration of cumulative impacts (due to overlapping UoAs) can be found at the following links:

- https://fisheries.msc.org/en/fisheries/szlc-csfc-fzlc-fsm-eez-longline-yellowfin-and-bigeye-tuna/@@view

- https://fisheries.msc.org/en/fisheries/pt-citraraja-ampat-sorong-pole-and-line-skipjack-and-yellowfin-tuna/@@view
- https://fisheries.msc.org/en/fisheries/mifv-rmi-eez-longline-yellowfin-and-bigeye-tuna/@@view
- https://fisheries.msc.org/en/fisheries/kiribati-albacore-bigeye-and-yellowfin-tuna-longline-fishery/@@view
- https://fisheries.msc.org/en/fisheries/french-polynesia-albacore-and-yellowfin-longline-fishery/@@view
- https://fisheries.msc.org/en/fisheries/japanese-pole-and-line-skipjack-and-albacore-tuna-fishery/@@view
- https://fisheries.msc.org/en/fisheries/solomon-islands-skipjack-and-yellowfin-tuna-purse-seine-and-pole-and-line/@@view
- https://fisheries.msc.org/en/fisheries/png-fishing-industry-associations-purse-seine-skipjack-yellowfin-tuna-fishery/@@view
- https://fisheries.msc.org/en/fisheries/solomon-islands-longline-albacore-and-yellowfin-tuna-fishery/@@view
- https://fisheries.msc.org/en/fisheries/pna-western-and-central-pacific-skipjack-and-yellowfin-unassociated-non-fad-set-tuna-purse-seine/@@view
- https://fisheries.msc.org/en/fisheries/north-buru-and-maluku-fair-trade-fishing-associations-indonesian-handline-yellowfin-tuna/@@view
- https://fisheries.msc.org/en/fisheries/tri-marine-western-and-central-pacific-skipjack-and-yellowfin-tuna/@@view
- https://fisheries.msc.org/en/fisheries/fiji-albacore-and-yellowfin-tuna-longline/@@view
- https://fisheries.msc.org/en/fisheries/ishihara-marine-products-albacore-and-skipjack-pole-and-line-fishery/@@view
- https://fisheries.msc.org/en/fisheries/tropical-pacific-yellowfin-and-skipjack-free-school-purse-seine-fishery/@@view
- https://fisheries.msc.org/en/fisheries/wpsta-western-and-central-pacific-skipjack-and-yellowfin-free-school-purse-seine/@@view

Table 18. Primary and secondary species caught in the ETBF, stock status and management measures.

Designation	Species	Stock status if known	Management	References
Primary main	Southern bluefin tuna *Thunnus maccoyii*	2017: SSB = 0.13 (0.11 – 0.17) SSB_{2017} relative to SSB_{msy} = 0.49 (0.38 – 0.69) F_{2017} relative to F_{msy} = 0.5 (0.38 – 0.66) 2014: 9% (7-12) of original biomass 2011: 5.5% (3-8) of original biomass IUCN: Critically endangered EPBC: Conservation dependent	Managed by the Commission for the Conservation of Southern Bluefin Tuna. Interim rebuilding target: 20% of original spawning stock biomass by 2035. A TAC set every three years by CCSBT is the primary management measure for this species. Members receive an annual allocation of this TAC, and there are specific provisions that allow for some carry-forwards of unused allocations between years. Australia's allocation is 6,165 tonnes for the 2018 – 2020 period. Current TAC set by CCSBT using a management procedure adopted in 2011. There is a 70% probability that this will achieve the interim rebuilding target. An update of the stock assessment is scheduled for 2020. For 2018 – 2020, Australia's allocation of the TAC is 34%. A Catch Documentation Scheme is in place, and a Quality Assurance Review programme assesses Members' performance against CCSBT requirements. Fishing activity managed in Australia through the Southern Bluefin Tuna Fishery Management Plan, which includes the identification of the interim rebuilding target as the reference point for this species. Monitoring of ETBF vessels includes VMS and electronic monitoring (on-vessel cameras), which enables catch verification.	AFMA 2016, 2019 CCSBT 2018 IUCN 2019
Primary main	Striped marlin *Kajikia* (*Tetrapturus) audax*	2012: B_{2011}/B_0=46% SB_{2011}/SB_0=39% $B_{current}$ relative to B_{msy} = 0.96; $SB_{current}$ relative to SB_{msy} = 1.09 2019: SSB = 0.198 IUCN: Near Threatened	Current management of this stock is based on the 2012 stock assessment, while a new harvest strategy is in development. The 2012 assessment concluded that catches were below but approaching MSY, and overfishing was not occurring though the stock was approaching an overfished state. The 2019 assessment found that this stock is likely to be overfished and close to experiencing overfishing, with reference to MSY-based reference points. Fishing mortality has increased over time. While persistent declines were estimated in biomass and spawning biomass in the timeframe considered by the assessment, the stock shows a slight improvement in status since the low-point of around 2010. Median recent spawning biomass relative to unfished levels is below 20%. Important uncertainties affecting estimates of stock status include a lack of knowledge on key life history characteristics (e.g. growth, natural mortality, movements). Take of this species is managed with an individually allocated quota in the ETBF. The TACC for striped marlin was 351 tonnes in 2019. The default limit reference points used by AFMA for this species are F_{MSY} and 20% SSB.	Davies et al. 2012 Ducharme-Barth et al. 2019 AFMA 2019 TTRAG 2020 Larcombe, J. pers. comm.

Designation	Species	Stock status if known	Management	References
Primary minor	Northern bluefin tuna *Thunnus orientalis*	Spawning biomass of 3.3% of original biomass Subject to overfishing. IUCN: Vulnerable	WCPFC adopted a harvest strategy for this species in 2017. The initial rebuilding target set out in that strategy is for the stock size of the median SSB estimated for the period 1952 through 2014 (6.7%$SSB_{F=0}$), to be reached by 2024 with at least 60% probability. The second rebuilding target is for the stock size of 20%$SSB_{F=0}$, to be reached by 2034, or 10 years after reaching the initial rebuilding target, whichever is earlier, with at least 60% probability. The probability of meeting these targets given management measures in place is 96%. The next stock assessment is planned for this species in 2020. AFMA must be notified before northern bluefin tuna is landed in port.	Pacific Bluefin Working Group 2018 AFMA 2019
Secondary main	Blue shark *Prionace glauca*	IUCN: Near Threatened	Limit reference points not determined for this southwest Pacific stock. Relationship between population inside and outside Australian EEZ unknown. A stock assessment was completed in 2016 but this is preliminary, a work in progress, and constrained by a lack of data including catch information. Further, where catch data are available, data quality presents issues for data use in a stock assessment. Stock assessment is timetabled for 2021, if data support this. The ETBF has a retention limit of 20 sharks per trip (or 10 *Elasmobranchii* per trip off Queensland). Wire traces were banned in the fishery in 2005. Take in excess of the number of tuna and billfish quota species taken per trip is not permitted. The species is classified as medium risk in the ecological risk assessment, and ongoing monitoring of catch information was recommended.	AFMA 2008 Takeuchi et al. 2016 WCPFC Secretariat et al. 2019 AFMA 2019 Sporcic et al. 2019
Secondary main	Ocean sunfish *Mola mola*	IUCN: Vulnerable	No species-specific management measures in place, though operational practices are expected to contribute to reducing UoA impacts. Almost all catch of this species is discarded and handling prior to release must promote post-release survival.	IUCN 2019
Secondary minor	Blue marlin *Makaira nigricans*	Stock not overfished, not experiencing overfishing. IUCN: Vulnerable	Stock status last assessed in 2015. Stock was considered nearly fully exploited at that time. Retention of this species is prohibited in the ETBF.	AFMA 2019 WCPFC 2018
Secondary minor	Black marlin *Makaira indica*	IUCN: Data deficient	Retention of this species is prohibited in the ETBF.	AFMA 2019 IUCN 2019
Secondary minor	Dusky whaler *Carcharhinus obscurus*	IUCN: Vulnerable	The ETBF has a retention limit of 20 sharks per trip (or 10 *Elasmobranchii* per trip off Queensland). Wire traces were banned in the fishery in 2005. Take in excess of the number of tuna and billfish quota species taken per trip is not permitted.	AFMA 2012 AFMA 2019 IUCN 2019
Secondary minor	Crocodile shark *Pseudocarcharias kamoharai*	IUCN: Least Concern	The ETBF has a retention limit of 20 sharks per trip (or 10 *Elasmobranchii* per trip off Queensland). Wire traces were banned in the fishery in 2005. Take in excess of the number of tuna and billfish quota species taken per trip is not permitted.	

Designation	Species	Stock status if known	Management	References
Secondary minor	Common thresher *Alopias vulpinus* Sandbar shark *Carcharhinus plumbeus* Smooth hammerhead *Sphyrna zygaena*	IUCN: Vulnerable	The ETBF has a retention limit of 20 sharks per trip (or 10 *Elasmobranchii* per trip off Queensland). Wire traces were banned in the fishery in 2005. Take in excess of the number of tuna and billfish quota species taken per trip is not permitted.	AFMA 2019 IUCN 2019
Secondary minor	Bronze whaler *Carcharhinus brachyurus* Tiger shark *Galeocerdo cuvier*	IUCN: Near Threatened		IUCN 2019
Secondary minor	Broadnose sevengill shark *Notorynchus cepedianus*	IUCN: Data deficient		IUCN 2019
Secondary minor	Gemfish *Rexea solandri* Ocean perch *Helicolenus* sp. Silver trevally *Pseudocaranx dentex* Chimeridae		Retention of these species is prohibited in the ETBF.	AFMA 2019
Secondary minor	Barracouta *Thyrsites atun* Snapper *Chrysophrys auratus*		Combined species limit of 200 kg per trip in Victorian waters. Per-species 200 kg limit for barracouta and 50 kg for snapper. Snapper limit of 10 fish per trip off Queensland, combined limit of 250 kg per trip off Tasmania.	AFMA 2019
Secondary minor	Australian bonito *Sarda australis* Rainbow runner *Elagatis bipinnulata*		Combined limit of 10 fish per trip off Queensland.	AFMA 2019
Secondary minor	Yellowtail kingfish *Seriola lalandi*		Limit of 10 fish per trip in Victorian waters; 2 fish per trip off Queensland.	AFMA 2019
Secondary minor	Wahoo *Acanthocybium solandri*		Combined limit off Queensland of 20 fish per trip, with elasmobranchs.	AFMA 2019
Secondary minor	All other non-target non-ETP species (Table 17)		Not classified as threatened or high risk. No specific management measures in place in the ETBF.	AFMA 2012 IUCN 2019 AFMA 2019

Table 19. Bait species and amounts used, shown as percent of total catch for the years 2016 - 2018. (Source: Logbook data provided by the client fishery).

Designation	Species	Source	2016 (%)	2017 (%)	2018 (%)	Usage, status and management	References
Primary main	Argentine shortfin squid *Illex argentinus*	Argentina	12.11	12.58	10.66	Classified as Least Concern, while heavily fished at (or possibly above) a level commensurate with MSY. Catches in the Argentinean EEZ have varied over time with 2016 catch reported at approximately 60,000 t and 40,000 t in the high seas. Bait used in the client fishery would be less than 1.3% of the EEZ catch. Management measures in place include spatial and seasonal restrictions; surveys of the stock are conducted and some observers are deployed for monitoring harvest; high level of IUU fishing known to occur among foreign vessels inside the Argentinean EEZ (40% of the total catch for 2012-2015); management objective is for 40% escapement with escapement below this threshold reported in recent years.	Arkhipkin et al. 2015 IUCN 2019 Sustainable Fisheries Partnership 2019
Primary minor	Mixed fish, may include: Blue mackerel *Scomber austrasicus*	Australia	0.97	0.95	0.57	All species are targets of the Australian small pelagic fishery. Catches assessed as sustainable (East: Catch ~2% of spawning stock biomass, below the target exploitation rate for this stock of 15%; West: Catch <2% of spawning stock biomass, below target exploitation rate of 3.75%); not overfished, not subject to overfishing.	Ward and Grammer 2018
Primary minor	Jack mackerel *Trachurus declivis*					Catches assessed as sustainable (Catch ~2-3% of spawning biomass and below the target exploitation rate of east and west stocks of 12%); not overfished, not subject to overfishing.	
Primary minor	Redbait *Emmelichthys nitidus*					Catches assessed as sustainable (East: <1% of spawning biomass and below the target exploitation rate of east and west stocks of 5%; West: Catch 1.7% of spawning stock biomass above the target exploitation rate of 1.25%; 2016/17 catch was 23% of recommended biological catch; status to be re-examined with 2018 data); not overfished, not subject to overfishing.	
Primary minor	Blue mackerel *Scomber austrasicus*	Australia (New South Wales)	0.25	0.26	0.28	Catches assessed as sustainable (Catch ~2% of spawning stock biomass, below the target exploitation rate for this stock of 15%); not overfished, not subject to overfishing.	Ward and Grammer 2018
Primary minor	Jack mackerel *Trachurus declivis*					Catches assessed as sustainable (Catch ~3% of spawning biomass and below the target exploitation rate for this stock of 12%); not overfished, not subject to overfishing.	Ward and Grammer 2018

Designation	Species	Source	2016 (%)	2017 (%)	2018 (%)	Usage, status and management	References
Primary minor	Australian sardine/ South American pilchard *Sardinops sagax*	Australia	1.53	1.31	1.47	Catches assessed as sustainable (6% of 2014 spawning biomass and below the target exploitation rate of 20%); not overfished, not subject to overfishing.	Ward and Grammer 2018
		Japanese				Above PRI, limit reference point and appears to be increasing in recent years. Harvest control rule in place. Management goal is to maintain current spawning stock biomass.	Sustainable Fisheries Partnership 2018
Secondary minor	Yellowtail scad *Trachurus novazelandiae*	Australia (New South Wales)	1.22	1.44	2.65	Caught in the New South Wales Ocean Hauling Fishery[5]. Stock classified as stable; fishing mortality considered low[6].	
Secondary minor	Yellowstripe scad *Selaroides leptolepis*	Australia (New South Wales)	0.20	0	0	Caught in the New South Wales Ocean Hauling Fishery[5]. Classified as Least Concern; population declines neither documented nor suspected in its range.	IUCN 2019
Secondary minor	New Zealand arrow squid *Nototodarus gouldi*	New Zealand				Use reported in small amounts when Argentine squid is in short supply. Imported from New Zealand. Catches vary between years. Total reported catches in 2018 and 2019 were 23,000 t and 43,340 t respectively[7]. No reference points or biomass estimates available, or stock assessment conducted. Annual life cycle of species has constrained modelling efforts. Trawl tow effort in the main fishery area is influenced by target species availability and interaction rates with the New Zealand sea lion (*Phoarctos hookeri*).	MPI 2017
Unknown	Other		0	0.0003	0.01	Not defined, may reflect logbook error.	

[5] https://www.dpi.nsw.gov.au/fishing/commercial/fisheries/ocean-hauling [Accessed 8 November 2019]
[6] https://www.fish.gov.au/report/217-Yellowtail-Scad-2018 [Accessed 8 November 2019]
[7] https://fs.fish.govt.nz/Page.aspx?pk=5&tk=96&ey=2018&fpid=48 [Accessed 8 November 2019]

Table 20. Seabirds recorded caught (alive or dead) in vessel logbooks, and their legal and conservation status. Unidentified albatrosses and shearwaters were also recoded. EPBC = Environment Protection and Biodiversity Conservation Act 1999; ACAP = Agreement on the Conservation of Albatrosses and Petrels.

Species	Listed	IUCN status (IUCN 2019)	Population trends	Threats	References
Australian gannet *Morus serrator*	EPBC	*Least Concern*	Increasing	Bycatch (e.g. in longline, gill net and trawl fisheries)	IUCN 2019
Wandering albatross *Diomedea exulans*	EPBC ACAP Annex 1	*Vulnerable*	Decreasing	No land-based threats in most breeding locations; bycaught in fisheries especially longline operations; ingestion of marine debris	ACAP 2012a
Black-browed Albatross *Thalassarche melanophris*	EPBC ACAP Annex 1	*Least Concern*	Increasing	Few land-based threats. Mortalities due to trawl and longline fishing.	ACAP 2012b
Flesh-footed shearwater *Ardenna (Puffinus) carneipes*	EPBC	*Near Threatened*	Decreasing	Widely bycaught in fisheries (e.g. in longline, gill net, purse seine, trawl fishing gears); ingestion of marine debris; vehicle-related mortalities at the Lord Howe Island breeding colony; nest predation may occur at some breeding colonies	IUCN 2019
Short-tailed shearwater *Ardenna (Puffinus) tenuirostris*	EPBC	*Near Threatened*	Decreasing	Bycaught in fisheries (e.g. longline, gill net); light pollution a particular issue for juveniles and mortalities often result from attraction to lights; ingestion of marine debris	IUCN 2019
Sooty shearwater *Puffinus griseus*	*EPBC*	*Near Threatened*	Decreasing	Bycatch documented from longline fisheries, trawl warps and nets; intentional take of chicks at some colonies; nest predation at some colonies	IUCN 2019

Table 21. Marine mammals recorded caught (alive or dead) in vessel logbooks, and their legal and conservation status. Unidentified dolphins, toothed whales, and whales were also recorded. EPBC = Environment Protection and Biodiversity Conservation Act 1999; CITES = Convention on International Trade in Endangered Species of Fauna and Flora; CMS = Convention on the Conservation of Migratory Species of Wild Animals (also known as the Bonn Convention). I and II designate the appendix on which species are listed.

Species	Listed	IUCN status (IUCN 2019)	Population trends	Threats	References
Australian fur seal *Arctocephalus pusillus doriferus*	*EPBC*	*A. pusillus: Least Concern*	*A. pusillus* Increasing	Bycaught in fishing gear (e.g. longline and trawl fisheries); may be indirect effects of fishing (competition for food) in some parts of the species' range; entanglement in marine debris.	IUCN 2019
Dugong *Dugong dugon*	*EPBC CITES I CMS II*	*Vulnerable*	Decreasing	Bycaught in fishing gears and shark nets; intentional take (including in Australia, by Aboriginal and Torres Strait Islander people[8]); loss of seagrass habitats; vessel traffic and ship strike	IUCN 2019
Bottlenose dolphin *Tursiops* spp.	*EPBC CITES II*	*Least Concern (T. truncatus) Data deficient (T. aduncus)*	Unknown	Bycaught/entangled by a range of fishing gears (gill nets, purse seines, trawls and longlines) and beach shark nets; intentional take in some countries (not Australia); may be affected by marine pollutants (e.g. PCBs), and vessel traffic where animals occur inshore.	IUCN 2019
False killer whale *Pseudorca crassidens*	*EPBC CITES II*	*Near Threatened*	Unknown	Bycaught in some fishing gears, including longline, purse seine and gill net; history of directed fishing in some countries (not Australia); may be affected by marine pollutants (including plastic ingestion).	IUCN 2019
Humpback whale *Megaptera novaeangliae*	*EPBC CMS I*	*Least Concern*	Increasing	Entanglement in fishing gear; vessel strike	IUCN 2019
Long-finned pilot whale *Globicephala melas*	*EPBC*	*Least Concern*	Unknown	Bycaught in fisheries; chemical pollutants	IUCN 2019
Melon-headed whale *Peponocephala electra*	*EPBC*	*Least Concern*	Unknown	Bycatch reported in some fishing gears; vulnerable to anthropogenic sound; may be affected by chemical and plastic pollution.	IUCN 2019
Short-finned pilot whale *Globicephala macrorhynchus*	*EPBC*	*Least Concern*	Unknown	Bycatch documented including on tuna longlines and in gill nets; history of intentional take (not in Australia); can be affected by anthropogenic sound and marine pollutants	IUCN 2019

[8] https://www.environment.gov.au/marine/marine-species/dugongs [Accessed 17 October 2019]

Table 22. Turtles recorded caught (alive or dead) in vessel logbooks, and their legal and conservation status. EPBC = Environment Protection and Biodiversity Conservation Act 1999; CITES = Convention on International Trade in Endangered Species of Fauna and Flora; CMS = Convention on the Conservation of Migratory Species of Wild Animals. I and II designate the appendix on which species are listed.

Species	Listed	IUCN status (IUCN 2019)	Population trends	Threats
Flatback turtle *Natator depressus*	*EPBC* *CITES I* *CMS I*	*Data deficient*		Bycaught/entangled in a variety of fishing gears (trawl, gill net, longline, pot) and ghost fishing gear; may be entangled in beach sharks nets; intentional take (including indigenous harvest in Australia); light pollution at nesting beaches; entanglement in and ingestion of marine debris; vessel strikes; coastal habitat degradation; listed as Vulnerable in Australia[9].
Green turtle *Chelonia mydas*	*EPBC* *CITES I* *CMS I*	*Endangered*	Decreasing	Bycaught/entangled in fishing gear (trawl, longline, gill net, purse seine, pot); beach shark nets and hook lines; vessel strikes; entanglement and ingestion of marine debris; coastal development; light pollution at nesting beaches; intentional take (indigenous harvest in Australia)[10]
Hawksbill turtle *Eretmochelys imbricata*	*EPBC* *CITES I* *CMS I*	*Critically Endangered*	Decreasing	Bycatch/entanglement in fishing gears (e.g. longline, trawl, gill net, purse sine, pot, and ghost gear) and beach shark nets and hook lines; entanglement in and ingestion of marine debris; deliberate take (including indigenous harvest in Australia); light pollution at nesting beaches; egg predation in Australia by introduced predators[11]
Leatherback turtle *Dermochelys coriacea*	*EPBC* *CITES I* *CMS I*	*Vulnerable*	Decreasing	Bycatch/entanglement in fishing gears (e.g. longline, trawl, gill net, and pot) and beach shark nets and hook lines; entanglement in and ingestion of marine debris; deliberate take (not in Australia); vessel strike; intentional take (not in Australia)[12]
Loggerhead turtle *Caretta caretta*	*EPBC* *CITES I* *CMS I*	*Vulnerable*	Decreasing	Bycatch/entanglement in fishing gears (e.g. longline, trawl, gill net, and pot) and beach shark nets and hook lines; entanglement in and ingestion of marine debris; deliberate take (not in Australia); vessel strike; intentional take (indigenous harvest not considered common in Australia); nest site disturbance; nest predation in Australia by introduced predators[13]
Olive ridley turtle *Lepidochelys olivacea*	*EPBC* *CITES I* *CMS I*	*Vulnerable*	Decreasing	Bycatch/entanglement in fishing gears (e.g. longline, trawl, gill net and ghost gear) and beach shark nets and hook lines; entanglement in and ingestion of marine debris; deliberate take (not in Australia); vessel strike; intentional take (indigenous harvest is documented in Australia); nest site disturbance; nest predation in Australia by introduced predators[14]

[9] http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=59257 [Accessed 17 October 2019]
[10] http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1765 [Accessed 17 October 2019]
[11] http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1766 [Accessed 17 October 2019]

Table 23. Protected fish species recorded caught (alive or dead) in vessel logbooks, and their legal and conservation status. EPBC = Environment Protection and Biodiversity Conservation Act 1999; CITES = Convention on International Trade in Endangered Species of Fauna and Flora; CMS = Convention on the Conservation of Migratory Species of Wild Animals. I and II designate the appendix on which species are listed.

Species	Listed	IUCN status (IUCN 2019)	Population trends	Threats	References
Giant manta ray *Mobula (Manta) birostris*	*EPBC* *CMS I, II*	*Vulnerable*	Decreasing	Targeted and incidental catch in fishing operations (e.g. harpoon, trawl and gill net methods, longline, purse seine) and beach shark nets; captures reported in ghost fishing gear; vessel strike.	IUCN 2019
Grey nurse shark *Carcharias taurus*	*EPBC*	*Vulnerable*	Unknown	Bycaught in some fishing gear (including net and longline fisheries); populations affected by previous directed fishing effort; mortalities recorded in beach shark nets[15] Retention prohibited in the ETBF.	AFMA 2019
Longfin mako *Isurus paucus*	*EPBC* *CMS II*	*Endangered*	Decreasing	Targeted fishing and bycatch (e.g. longline, purse seine, gill net, trawl fisheries); recreational fishing may occur in Australian Commonwealth waters[16]. This species may be retained only if brought to the vessel dead.	AFMA 2019 IUCN 2019
Shortfin mako *Isurus oxyrinchus*	*EPBC* *CMS II*	*Endangered*	Decreasing	Targeted fishing and bycatch (caught in a range of fisheries by diverse fishing gears, e.g. longline, purse seine, gill net, trawl) and by recreational fishers; recreational fishing may occur in Australian Commonwealth waters. Stock to be assessed for WCPFC in 2021 if data allows. This species may be retained only if brought to the vessel dead.	AFMA 2019 IUCN 2019
Porbeagle *Lamna nasus*	*EPBC* *CITES II* *CMS II*	*Vulnerable*	Decreasing	Targeted fishing and bycatch (caught in a range of fishing gears, e.g. longline, gill net, trawl, handline); recreational fishing may occur in Australian Commonwealth waters. Fishing mortality on the southern hemisphere stock of this species is considered to be very low. There is a very low risk that overfishing of this species is occurring in its southern hemisphere range. This species may be retained only if brought to the vessel dead.	ABNJ 2017 AFMA 2019 IUCN 2019

[12] http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1768 [Accessed 17 October 2019]
[13] http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1763 [Accessed 17 October 2019]
[14] http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1767 [Accessed 18 October 2019]
[15] http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=68751 [Accessed 18 October 2019]
[16] http://www.environment.gov.au/resource/three-sharks-listed-migratory-species-under-epbc-act [Accessed 18 October 2019]

Species	Listed	IUCN status (IUCN 2019)	Population trends	Threats	References
Oceanic whitetip shark *Carcharhinus longimanus*	*WCPFC CITES II*	*Vulnerable*	Decreasing	Widely caught in fisheries especially pelagic longline, gill net (drift net) and was historically common. Now overfished and subject to overfishing, with extinction trajectory in the WCPFO under current levels of fishing mortality. Retention prohibited in the ETBF.	AFMA 2019 IUCN 2019 Tremblay-Boyer et al. 2019
Silky shark *Carcharhinus falciformis*	*EPBC CITES II CMS II*	*Vulnerable*	Decreasing	Targeted fishing and bycatch worldwide (e.g. in longline, purse seine and artisanal fisheries); entanglement in marine debris and fish aggregating devices used in purse seine tuna fisheries. Modelling of the WCPO population concludes (with significant uncertainties) that the stock appears not to be overfished, but is subject to overfishing (fishing mortality is 1.6 times F_{MSY}). Retention prohibited in the ETBF.	ABNJ 2018 Clarke 2018 AFMA 2019 IUCN 2019
School shark *Galeorhinus galeus*	*EPBC*	*Vulnerable*	Decreasing	Fishing the primary threat to this species, which is caught in a variety of gears (e.g. longline, trawl, gill net). Both targeted fishing and bycatch occur. In the ETBF, single individual was reported caught 2016 – 2018 and retention of this species is prohibited.	AFMA 2019 IUCN 2019
Whale shark *Rhincodon typus*	*EPBC CITES II CMS I, II*	*Endangered*	Decreasing	Intentional take (not in Australia); bycatch (e.g. in gill net and purse seine fisheries); vessel strike; potential threats include habitat degradation and loss (of coral reefs)[17]	IUCN 2019

[17] http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=66680 [Accessed 18 October 2019]

7.2.5 Principle 2 Performance Indicator scores and rationales

PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
	Main primary species stock status			
a	Guide post	Main primary species are **likely** to be above the PRI. OR If the species is below the PRI, the UoA has measures in place that are **expected** to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are **highly likely** to be above the PRI. OR If the species is below the PRI, there is either **evidence of recovery** or a demonstrably effective strategy in place **between all MSC UoAs which categorise this species as main**, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main primary species are above the PRI **and are** fluctuating around a level consistent with MSY.
	Met?	**SBT: Yes** **STM: Yes** **AS: Yes**	**SBT: Yes** **STM: Yes** **AS: Yes**	**SBT: No** **STM: No** **AS: No**
Rationale				

There are three main primary species: Southern bluefin tuna (SBT), striped marlin (STM) and Argentine squid (AS, used as bait).

Southern bluefin tuna:
In 2017, spawning biomass of this species was estimated at 13% of its original biomass, and below a level that could produce MSY. However, while the stock is overexploited and abundance is low (and below PRI), fishing mortality stock-wide is assessed as below the level associated with MSY. The UoA take of this species is managed with a quota, which is in turn set with reference to the member allocation that Australia receives from CCSBT, the regional fisheries management organisation responsible for southern bluefin tuna. CCSBT has set an interim rebuilding target for southern bluefin tuna of 20% of original spawning stock biomass by 2035. The current TAC set by CCSBT (using the 2011 management procedure) has a 70% probability of rebuilding to this interim target by 2035. Together, this status and management approach comprise evidence that there are measures in place to ensure the UoA does not hinder recovery and rebuilding[18].

The 2017 assessment reflects an improvement in stock status from previous years (in 2011 and 2014 the spawning biomass was estimated at 5.5% (3–8%) and 9% (7-12%) of its original biomass). Therefore, there is some evidence that recovery is occurring in this stock. There are no other UoAs in which this species is characterised as main. The interim rebuilding target alongside the TAC, quota set with reference to Australia's allocation from CCSBT, and other management measures in place (see Table 18) comprise a strategy to ensure that recovery and rebuilding are not hindered by the UoA.

SG 60 and SG80 are met. The species is below PRI and not fluctuating around a level consistent with MSY. Therefore, SG100 is not met.

[18] MSC 2018, refer GSA3.4.6

Striped marlin:
At the RFMO level, WCPFC CMM2006-04 applies to this stock. In Australia, allocation of quota in accordance with a TACC and catch shares (known as Statutory Fishing Rights) are the cornerstone of the management strategy. The TACC is developed nationally by considering biological and other information. The TACC was not caught in full 2011-2018. Catch in the ETBF comprised 19% of the WCPFC catch of this stock on average, in 2013-17 (TTRAG 2018).

The 2012 stock assessment (Davies et al. 2012) provided the basis for management in place for this species at the time of reassessment. That assessment concluded that the stock status was above PRI, at 46% of unfished biomass (34% of spawning biomass).

The stock was reassessed in 2019, with the findings of that assessment incorporated into WCPFC management advice in August 2019. The 2019 assessment found that the stock was likely to be overfished and close to experiencing overfishing (Ducharme-Barth et al. 2019). Recent fishing mortality was considered to be slightly below F_{MSY}. There is a 69% probability that recent spawning biomass is at a level lower than $SB_{MSY,}$ and a negative recruitment trend persists. Median recent spawning biomass depletion relative to unfished levels is below 20%.

The management of striped marlin is currently being reviewed, including to incorporate the latest stock status information, and a new harvest strategy developed (TTRAG 2020).

While the latest stock assessment for this species shows it as below PRI, the stock assessment shows a slight improvement in stock status in recent years compared to early in the previous decade. For example, fishing mortality has reduced since the early 2010s. Allocation of quota in accordance with a TACC and catch shares is an effective approach to managing catch. These elements have been in place in the fishery for some time, and the harvest strategy is currently being updated (including to reflect the 2019 WCPFC management advice).

Recent catch levels in the ETBF alone are unlikely to hinder recovery and rebuilding[18]. There are no other MSC UoAs which classify this species as main. Stock-wide, F is assessed as below F_{MSY}. SG60 and SG80 are met.

There is not a high degree of certainty that this species is at a level above the PRI and fluctuating around a level consistent with MSY. Therefore, SG100 is not met.

Argentine squid:
This species is used as bait in the fishery. Its life history creates challenges for conventional stock assessment approaches, in that the species is short-lived and its abundance is significantly affected by environmental conditions. Two recently published assessments for the southwest Atlantic population covering the years 1993 – 2012 concluded the stock was good condition and not experiencing overfishing. Further, the bait used in by the client fishery comprises less than 1.3% of the Argentinean EEZ catch of this species. SG 60 is met because the stock appears likely to be above the PRI. Further, in any case, the amount of bait of this species used would not hinder recovery or rebuilding. SG80 is met because the species is considered highly likely to be above PRI. It cannot be concluded based on current information that there is a high degree of certainty that the stock is fluctuating around a level consistent with MSY. This is because stock assessments for more recent years are not available and some concerns with the fishery exist (e.g. a high level of IUU activity, Table 19). SG100 is not met.

In summary, SG80 is met for all primary main species. None meet the requirements of SG100.

b	Minor primary species stock status			
	Guide post			Minor primary species are highly likely to be above the PRI. OR If below the PRI, there is evidence that the UoA does not hinder the

				recovery and rebuilding of minor primary species.
	Met?			**All: Yes**

Rationale

There are five minor primary species, four of which are the bait used in the fishery.

Northern bluefin tuna:
AFMA must be notified before northern bluefin tuna is landed in port, and guidance to fishers is included in the ETBF management plan on steps that can be taken to distinguish northern and southern bluefin tuna. This species is below the PRI with a spawning biomass of 3.3% of original biomass. It is also subject to overfishing. The 2018 assessment projection results are more positive than in 2016, mainly due to increased recruitment. Take of this species is very low at 0.01 – 0.03% of total UoA catch. Expected annual yield for this species in 2019 in the Western Pacific is around 4,400 mt. In this context, if UoA take in 2019 is at the highest documented between 2016-2018 (0.03% of UoA catch), this is 0.04% of the species' annual yield.

While the species is below PRI, the very low level of UoA take and preliminarily positive trend in stock status are considered evidence that the UoA will not hinder the recovery and rebuilding of this species. SG100 is met.

Blue mackerel:
Catches of this species are assessed as sustainable in the Australian small pelagic fishery. (East: Catch is ~2% of spawning stock biomass, below the target exploitation rate for this stock of 15%; West: Catch is <2% of spawning stock biomass, below target exploitation rate of 3.75%). The species is not overfished nor subjected to overfishing. The stock is highly likely to be above PRI. SG100 is met.

Jack mackerel:
Catches of this species are assessed as sustainable in the Australian small pelagic fishery. (Catch is ~3% of spawning biomass and below the target exploitation rate for this stock of 12%). The species is not overfished nor subjected to overfishing. The stock is highly likely to be above PRI. SG100 is met.

Redbait:
Catches of this species are assessed as sustainable in the Australian small pelagic fishery. (East: Catch is <1% of spawning biomass and below the target exploitation rate of east and west stocks of 5%; West: Catch is 1.7% of spawning stock biomass above the target exploitation rate of 1.25%; 2016/17 catch was 23% of recommended biological catch). The species is not overfished nor subjected to overfishing. The stock is highly likely to be above PRI. SG100 is met.

Australian sardine:
Catches of this species are assessed as sustainable in the Australian small pelagic fishery (6% of 2014 spawning biomass and below the target exploitation rate of 20%). The species is not overfished nor subjected to overfishing. The Japanese population of this species is considered to be above the PRI and the limit reference point and appears to be increasing in recent years. The species (both bait populations) is highly likely to be above PRI. SG100 is met.

In summary, all minor primary species meet the requirements of SG100.

References

AFMA. 2019. Eastern Tuna and Billfish Fishery Management Arrangements Booklet 2019. Australian Fisheries Management Authority, Canberra.

CCSBT. 2018. Report of the Twenty Third Meeting of the Scientific Committee. 8 September 2018. Commission for the Conservation of Southern Bluefin Tuna.

Chang, K.-Y., Chen, C.-S., Chiu, T.-Y., Huang, W.-B. and Chiu, T.-S. 2016. Argentine shortfin squid (*Illex argentinus*) stock assessment in the southwest Atlantic using geostatistical techniques. Terrestrial, Atmospheric and Oceanic Sciences 27: 281 – 292.

Davies, N., Hoyle, S. and Hampton, J. 2012. Stock assessment of striped marlin (*Kajikia audax*) in the Southwest Pacific Ocean. Technical Report WCPFC-SC8-2012/SA-WP-05, Scientific Committee, 14th Regular Session. Busan, Republic of Korea, 7-15 August 2012. Western and Central Pacific Fisheries Commission.

Pacific Bluefin Working Group. 2018. Harvest strategy for Pacific bluefin tuna fisheries. Harvest Strategy 2017-02. Western and Central Pacific Fisheries Commission 14th Regular Session. Manila, Philippines. 3 – 7 December, 2017. Available at: https://www.wcpfc.int/node/31804 [Accessed 8 November 2019]

Sustainable Fisheries Partnership (SFP). 2018. South American pilchard Japanese Pacific. FishSource profile. In: FishSource [online]. Updated 8 May 2018. Available at: https://www.fishsource.org/stock_page/2317. [Accessed 21 October 2019].

TTRAG. 2018. Advice for the Eastern Tuna and Billfish Fishery in the 2019 Season. September 2018.

TTRAG. 2020. Tropical Tuna and Billfish Fisheries Resource Assessment Group TTRAG 26. 20 January 2020. Out of Session.

Wang, J., Chen, X., Staples, K.W. and Yong, C. 2018. A stock assessment for *Illex argentinus* in the southwest Atlantic using an environmentally dependent surplus production model. Acta Oceanologica Sinica 37: 94-101.

Ward, T. M. and Grammer, G. L. 2018. Commonwealth Small Pelagic Fishery: Fishery Assessment Report 2017. Report to the Australian Fisheries Management Authority. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2010/000270-9. SARDI Research Report Series No. 982.

WCPFC. 2018. Pacific bluefin tuna (*Thunnus orientalis*): Stock status and trends plus management advice and implications. Available at: https://www.wcpfc.int/doc/06/pacific-bluefin-tuna [Accessed: 8 November 2019]

Overall Performance Indicator score	**90**
Condition number (if relevant)	

PI 2.1.2 – Primary species management strategy

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a **partial strategy** in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a **strategy** in place for the UoA for managing main and minor primary species.
	Met?	**SBT: Yes** **STM: Yes** **AS: Yes**	**SBT: Yes** **STM: Yes** **AS: Yes**	**SBT: Yes** **STM: Yes** **AS: No** **Minor: Yes (3 species); No (2 species)**
Rationale				

Main primary species
Southern bluefin tuna (SBT):
Measures in place that are expected to not hinder the rebuilding of this species to above PRI include a TAC and nationally-allocated catch limit that the ETBF operates within. (Australia's national allocation is set by CCSBT). Quota is allocated to rights-holders within the ETBF for commercial catch of this species. The management arrangements including those that relate to quota, catch reporting and monitoring are documented together in a publication. Monitoring by fisheries observers and using on-vessel cameras provides for catch verification. Together, the measures comprise a partial strategy. SG60 and SG80 are met.

Mechanisms for the modification of fishing practices (if unacceptable impacts are identified) are in place at the national and RFMO level. For example, the TAC and national allocation (within which the ETBF take of SBT occurs) can be adjusted. A mechanism is also in place for addressing overcatch of this species. Collectively, the management measures in place comprises a strategy. SG100 is met.

Striped marlin (STM):
Allocation of quota in accordance with a TACC and catch shares (known as Statutory Fishing Rights) is the cornerstone of the management strategy for this species. The TACC is developed by considering biological and other information and is expected to not hinder recovery or rebuilding. The harvest strategy is currently under review, and management measures implemented will reflect the latest information on stock status from the 2019 assessment. While this review is completed, the previous management settings remain in place. At-sea monitoring using on-vessel cameras provides for verification of catch reports. These measures together comprise a UoA-specific strategy for managing this species. SG60, SG80 and SG100 are met.

Argentine squid (AS):
Management measures in place include spatial and seasonal restrictions, and there is a management objective of 40% escapement. These measures comprise a partial strategy. Further, the amount of this species used as bait is <1.3% of the Argentinean EEZ catch. With such a small proportion of bait used, the impact of the UoA on this species is expected to not hinder the rebuilding or maintenance of the Argentine squid stock at or above PRI. SG 60 and SG80 are met.

There is an uncertain amount of IUU activity occurring in the fishery and it has been reported that the management objective has not been met in recent years. It does not appear that the partial strategy includes mechanisms for modifying fishing practices in light of unacceptable impacts. SG100 is not met.

Minor primary species
Northern bluefin tuna:
AFMA must be notified before northern bluefin tuna is landed in port, and guidance to fishers is included in the ETBF management plan on steps that can be taken to distinguish northern and southern bluefin tuna. At the RFMO level, there is a harvest strategy in place for this species. At the fishery level, management of catch of this species focused on monitoring and catch verification. The level of catch is very low, and the species cannot be economically targeted. The approach to managing this species comprises a partial strategy. However, a UoA-specific strategy has not been developed for this species. SG100 is not met.

Blue mackerel, Jack mackerel, Redbait and Australian sardine:
These species are managed through the Small Pelagic Fishery Management Plan (in Australia), in accordance with target exploitation rates, and input and output controls. For example, there are TACs in place for quota species, area closures, catch reporting requirements, and monitoring (including by observers and Vessel Monitoring Systems for vessels holding a Commonwealth fishing concession). For the bait species sourced in Australia, SG100 is met.

The Japanese population of Australian sardine is managed in accordance with a limit reference point and harvest control rule. The fishery should be closed if biomass falls below a specified level, which is the lowest stock abundance reached in the 1950s/1960s. The management objective is to maintain spawning stock biomass, which is considered to be above PRI. There are some concerns reported about the derivation and implementation of recommended catch levels, therefore SG100 is not met.

b	Management strategy evaluation			
	Guide post	The measures are considered **likely** to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some **objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	**SBT: Yes** **STM: Yes** **AS: Yes**	**SBT: Yes** **STM: Yes** **AS: Yes**	**SBT: Yes** **STM: No** **AS: No** **Minor: Yes (3 species); No (2 species)**
Rationale				

Main primary species
Southern bluefin tuna (SBT):
TAC, catch allocation and quota are common and well-tested fisheries management measures in a range of fisheries, including tuna fisheries. SG60 is met.

There is an extensive body of knowledge about the southern bluefin tuna fishery globally (e.g., accumulated by CCSBT and member countries) and the ETBF. This includes stock status and catch information for the species. Monitoring information confirming that catch limits are adhered to (within the ETBF, and more broadly through catch reports to CCSBT), and indications that the stock status is improving overall, comprise and objective basis for confidence that the measures will work. This information is available from fisheries catching southern bluefin tuna. SG80 is met.

Regular stock assessments provide a test as to whether the management strategy is working overall to rebuild the stock, as implemented by CCSBT including in Australia. While the stock is still below PRI, its status is improving, which demonstrates that the management strategy is working. SG 100 is met.

Striped marlin (STM):
Allocation of quota in accordance with a TACC, catch shares (known as Statutory Fishing Rights) are standard fisheries management measures. These measures are considered likely to work, based on plausible argument. SG60 is met.

An objective basis for confidence that the management approach will work is provided by information about both the ETBF and this species. This includes a time series of verifiable catch and effort information, and ongoing monitoring of the fishery. Further, a review of the harvest strategy highlights recognition that management approaches should be updated over time. SG80 is met.

AFMA's harvest strategy relevant to striped marlin is currently being reviewed and the 2019 stock assessment for this species will inform future management settings (to be finalised during 2020). The TAC for this species has not be caught in recent years. The relationship between the Australian population and the southwest Pacific stock (e.g. extent of connectivity) is unknown. At the RFMO level, the development of stronger management measures for this species has been discussed, with FFA undertaking to providing proposals to the WCPFC in 2020. At this time, testing does not provide high confidence that the strategy will work. SG100 is not met.

Argentine squid (AS):
Management measures in place include spatial and seasonal restrictions, and there is a management objective of 40% escapement. There are also mechanisms in place to establish the legality of catches taken from within the Argentinian EEZ. These measures together comprise a partial strategy. Therefore, SG 60 and SG80 are met.

There is an uncertain amount of IUU activity occurring in the fishery and it has been reported that the management objective has not been met in recent years. Therefore, it is uncertain whether the partial strategy is demonstrably working in recent years, or currently. Testing has not delivered high confidence that the partial strategy will work. SG100 is not met.

Minor primary species
Northern bluefin tuna and Australian sardine:
Measures or a partial strategy are not required for minor species. (These species reach SG80 by default). A strategy is not in place for these minor species, therefore SG100 cannot be met.

Blue mackerel, Jack mackerel, Redbait:
These species are all managed in accordance with target exploitation rates. Management strategy evaluations have been conducted, and recommendations made to inform appropriate use of these strategies over time. Testing therefore supports high confidence that the strategies will work, based on information about the fishery and species involved. SG100 is met.

C	Management strategy implementation			
	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its overall objective as set out in scoring issue (a).**
	Met?		**SBT: Yes** **STM: Yes** **AS: No**	**SBT: Yes** **STM: No** **AS: No** **Minor: Yes (3 species); No (2 species)**
Rationale				

Main primary species

Southern bluefin tuna (SBT):
Evidence that the measures/partial strategy are being implemented successfully is provided in part by electronic monitoring and human observers. It is also reported to CCSBT in Australia's national report. The information recorded includes southern bluefin tuna catch information, fishing effort and monitoring coverage. Performance of the fishery is reported annually by the Australian government. SG80 is met. The southern bluefin tuna stock has improved in status, which implies that at the RFMO level, the strategy is being implemented at least somewhat successfully and is achieving its overall objective. SG100 is met for this species.

Striped marlin (STM):
Evidence that the strategy is being implemented successfully includes verification of catch reporting and other elements of fishing operations, through electronic monitoring. Fisher reporting and compliance monitoring also occurs. SG80 is met. While there is clear evidence of implementation, the efficacy of the strategy in achieving its overall objective is unclear at this time. SG100 is not met.

Argentine squid (AS):
There is an uncertain amount of IUU activity occurring in the fishery and it has been reported that the management objective has not been met in recent years. Recent stock assessment information is not available. Therefore, it is uncertain whether the partial strategy is being implemented successfully. SG80 is not met.

Minor primary species
Northern bluefin tuna and Australian sardine:
Measures or a partial strategy are not required for minor species. (These species reach SG80 by default). A strategy is not in place for these minor species, therefore SG100 cannot be met.

Blue mackerel, Jack mackerel, Redbait:
In Australian waters, management arrangements are clearly set out. The outcomes of management measures implemented for these fisheries include that the stocks are not overfished and not subject to overfishing. Evidence of implementation of the management measures applicable to this fishery is collected by human observers and electronic monitoring, logbook information and catch disposal records. Fishery performance is reported annually. The Commonwealth Small Pelagic Fishery is reviewed by the government, and management measures in place are considered appropriate to meet management objectives. For these minor species, there is clear evidence that the strategies are being implemented and are achieving their objectives. SG100 is met.

d	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**NA**	**NA**	**NA**
Rationale				

There are no sharks present in the catch as primary species. Therefore, this scoring issue is not scored[19].

e	Review of alternative measures			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they

[19] MSC (2018) GSA3.5.1

			are implemented as appropriate.	are implemented, as appropriate.
	Met?	**SBT: Yes** **STM: Yes** **AS: Not scored**	**SBT: Yes** **STM: Yes** **AS: Not scored**	**SBT: Yes** **STM: Yes** **AS: Not scored** **Minor: Not scored**

Rationale

Southern bluefin tuna (SBT), striped marlin (STM):
The review of practices to minimise UoA mortality of unwanted primary species is focused on handling and release practices. In 2016, AFMA introduced a permit condition around handling unwanted catch, with the aim of increasing survival after release. This followed the introduction of electronic monitoring, which enabled the catch handling (including of discarded fish) to be reviewed across the fleet. Guidance materials on handling to promote the post-release survival of unwanted catch was also developed, including a publication and instructional video. SG60 is met.

The instructional video on bycatch handling was re-released in 2018 via social media. The review of handling practices is ongoing, with analysts viewing electronic monitoring imagery highlighting incidents of inappropriate handling for appropriate follow-up by AFMA, including compliance and enforcement staff. It is a requirement that all catch that is to be released or discarded must be handled within view of the electronic monitoring camera. In addition to reviewing handling of unwanted catch and implementing requirements to promote post-release survival when catch is discarded, a permit condition has been implemented that requires vessels to carry at least one dehooker and line-cutter.

Permit conditions require that southern bluefin tuna can only be released if in a live and vigorous state. Fish to be released must not be gaffed. For this species, rationale for differences between various post-capture survival estimates reported have been considered in recent years.

SG80 and SG100 are met.

Argentine squid (AS), Northern bluefin tuna (NBT) and minor bait species (Blue mackerel, Jack mackerel, Redbait and Australian sardine):
There is minimal unwanted catch known to occur in relation to the UoA. Therefore, scoring issue (e) is not applied.

References

AFMA. 2016. Bycatch handling: AFMA bycatch handling and treatment guide 2016/17. Australian Fisheries Management Authority, Canberra.

AFMA (ed). 2018 Small Pelagic Fishery Management Arrangements Booklet 2018-19, Australian Fisheries Management Authority. Canberra.

AFMA. 2019. Eastern Tuna and Billfish Fishery: Fishery Management Strategy 2019 – 2023. Australian Fisheries Management Authority, Canberra.

AFMA. 2019. Eastern Tuna and Billfish Fishery Management Arrangements Booklet 2020. Australian Fisheries Management Authority, Canberra.

CCSBT. 2018. Report of the Twenty Third Meeting of the Scientific Committee. 8 September 2018. Commission for the Conservation of Southern Bluefin Tuna.

Commonwealth of Australia. 2018. Assessment of the Commonwealth Small Pelagic Fishery: October 2018. Department of the Environment.

Pacific Bluefin Working Group. 2018. Harvest strategy for Pacific bluefin tuna fisheries. Harvest Strategy 2017-02. Western and Central Pacific Fisheries Commission 14th Regular Session. Manila,

Philippines. 3 – 7 December, 2017. Available at: https://www.wcpfc.int/node/31804 [Accessed 8 November 2019]

Patterson, H. and Hansen, S. 2016. Post-release survival in tuna and tuna-like species in longline fisheries: an update. CCSBT-ESC/1609/BGD 01. Working Paper prepared for the CCSBT Extended Scientific Committee for the 21st Meeting of the Scientific Committee 5–10 September, Kaohsiung, Taiwan.

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2019. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Sustainable Fisheries Partnership (SFP). 2018 Argentine shortfin squid SW Atlantic. FishSource profile. In: FishSource [online]. Available at: https://www.fishsource.org/fishery_page/3728 [Accessed 21 October 2019].

Sustainable Fisheries Partnership (SFP). 2018. South American pilchard Japanese Pacific. FishSource profile. In: FishSource [online]. Updated 8 May 2018. Available at: https://www.fishsource.org/stock_page/2317. [Accessed 21 October 2019].

Ward, T. M., Grammer, G. L. 2018. Commonwealth Small Pelagic Fishery: Fishery Assessment Report 2017. Report to the Australian Fisheries Management Authority. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2010/000270-9. SARDI Research Report Series No. 982.

WCPFC. 2020. Draft Summary Report as at 18 February 2020. Western and Central Pacific Fisheries Commission [1]6th Regular Session. Port Moresby, Papua New Guinea. 5 – 11 December, 2019. Available at: https://www.wcpfc.int/meetings/wcpfc16 [Accessed 24 February 2020].

Websites [Accessed 8 November 2019]:
https://www.transparency.gov.au/annual-reports/australian-fisheries-management-authority/reporting-year/2018-2019-31

https://www.transparency.gov.au/annual-reports/australian-fisheries-management-authority/reporting-year/2018-2019-27

https://l.facebook.com/l.php?u=http%3A%2F%2Fwww.afma.gov.au%2Fsustainability-environment%2Fbycatch-discarding%2F%3Ffbclid%3DIwAR2ecQ1_h8oZDLqb9Inj4JOqfopjKlJKgjpAcLa8Blkr3BR6O9l8RXM9xz0&h=AT2L7GAX6_ZWRGMm12SirOzwqD4cJfUWfRCqXEdGBHMXFxjLLbkO8qhEdNANnQ1O33DfvsIYB7_SVASxXWaDJSKEazeU7lHi-cxNc3jeIHJVmDI_NZqoZKI1kfYWkyT6jkityctDxtZHs7HX6A

Overall Performance Indicator score	75
Condition number	**9** For main primary species used as bait in the UoA, evidence shall be available at the fourth surveillance audit, that there is a partial strategy being successfully implemented to maintain or to not hinder stock rebuilding at/to levels which are highly likely to be above the PRI.

PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is **adequate to estimate** the impact of the UoA on the main primary species with respect to status. **OR** **If RBF is used to score PI 2.1.1 for the UoA:** Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is **adequate to assess** the impact of the UoA on the main primary species with respect to status. **OR** **If RBF is used to score PI 2.1.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is **adequate to assess with a high degree of certainty** the impact of the UoA on main primary species with respect to status.
	Met?	**SBT: Yes** **STM: Yes** **AS: Yes**	**SBT: Yes** **STM: Yes** **AS: Yes**	**SBT: Yes** **STM: No** **AS: No**
Rationale				

Southern bluefin tuna (SBT):
There is a considerable body of quantitative information available on southern bluefin tuna. This includes catch information (the UoA catch of this species and catch in other parts of its range) and biological information. Much of this information has been reported through CCSBT: www.ccsbt.org. Stock status information overall is provided by the stock assessment. Quantitative information is available with which to consider the UoA catch in this context in detail. This is adequate to assess the impact of the UoA on the main primary species, with respect to status. SG60 and SG80 are met. The quantitative information available is also adequate to assess, with a high degree of certainty, the impact of the UoA on this species. SG100 is met.

Striped marlin (STM):
Quantitative information available that is relevant to assessing the UoA impact on this species includes catch information and some biological information. This is adequate to assess the impact of the UoA with respect to status. SG60 and SG80 are met. Stock assessment work highlights significant uncertainties and information needs that affect the confidence with which status can be evaluated. Key uncertainties include growth, natural mortality and movements. The relationship between the Australian population of this species and the southwest Pacific stock is not understood. Such information gaps preclude assessment of the impact of the UoA on this species with a high degree of certainty. SG100 is not met.

Argentine squid (AS):
Some information is available on the status of the Argentine squid and the amount of this species used as bait in the UoA. Quantitative information is available, exceeding the requirements of SG60. The quantitative information available is broadly adequate to infer the impact of the UoA on this species with respect to status. SG80 is met.

The impact of the UoA on the Argentine squid cannot be assessed with a high degree of certainty based on the quantitative information currently available. This is due to the stock assessments

available for this species being several years old, and the abundance of the species being highly variable over time. Therefore, SG100 is not met.

b	Information adequacy for assessment of impact on minor primary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			**Yes (All species)**
Rationale				

Some quantitative information is available on all minor primary species, which enables the impact of the UoA on these species to be estimated (e.g. see Table 17). For the northern bluefin tuna, this assessment is based on the amount of catch in the UoA as a proportion of the annual yield of this depleted species. The amount of bait species used in the UoA is documented, which can be considered as a component of past or current catch. For all minor primary species, quantitative information is sufficient estimate the impact of the UoA on minor primary species with respect to status (e.g., see Table 18 and references therein). SG100 is met.

c	Information adequacy for management strategy			
	Guide post	Information is adequate to support **measures** to manage **main** primary species.	Information is adequate to support a **partial strategy** to manage **main** primary species.	Information is adequate to support a **strategy** to manage **all** primary species, and evaluate with a **high degree of certainty** whether the strategy is achieving its objective.
	Met?	**SBT: Yes** **STM: Yes** **AS: Yes**	**SBT: Yes** **STM: Yes** **AS: Yes**	**SBT: Yes** **STM: No** **AS: No** **Minor: Yes (all species)**
Rationale				

Main species:
Southern bluefin tuna (SBT):
A large body of information is available to inform the management of this species, including catch and biological information, and an assessment of stock status. The available information is adequate to support measures and a partial strategy to manage this species. SG60 and SG80 are met. Information is also adequate to support a strategy, and evaluate with a high degree of certainty, whether this is achieving its objective. SG100 is met.

Striped marlin (STM):
Quantitative information on this species and its catch in the UoA is adequate to support a strategy to manage this species. However, information currently does not appear to be adequate to assess whether or not there is a high degree of certainty that the strategy is achieving its objective. SG100 is not met.

Argentine squid (AS):
Information is adequate to support a partial strategy to manage this species (e.g., see Table 19). However, information is not adequate to assess with a high degree of certainty that a strategy is achieving its objective. For example, recent information on stock status appears to be lacking. The

extent of IUU fishing for squid and impacts of this (in terms of achievability of the objective) are unknown. SG60 and SG80 are met. SG100 is not.

Minor species:
Northern bluefin tuna:
Information is adequate to support measures, a partial strategy and a strategy for managing this species. For example, catch levels are documented (and are extremely low) and the species' status has been assessed. Information is adequate to determine with a high degree of confidence whether a strategy is achieving its objectives. SG100 is met.

Blue mackerel, jack mackerel, redbait, Australia sardine:
Information on the amount of bait used, and the status of the source populations, is adequate to support a strategy to manage the impacts of the UoA. Information is also adequate to assess whether the strategy is achieving its objective with a high degree of certainty. SG100 is met.

References

Sustainable Fisheries Partnership (SFP). 2018. Argentine shortfin squid SW Atlantic. FishSource profile. In: FishSource [online]. Available at: https://www.fishsource.org/fishery_page/3728 [Accessed 21 October 2019].

Overall Performance Indicator score	90

PI 2.2.1 – Secondary species outcome

PI 2.2.1		**The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit**		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guide post	Main secondary species are **likely** to be above biologically based limits. OR If below biologically based limits, there are **measures** in place expected to ensure that the UoA does not hinder recovery and rebuilding.	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. AND Where catches of a main secondary species outside of biological limits are **considerable**, there is either **evidence of recovery** or a, **demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species**, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main secondary species are above biologically based limits.
	Met?	**BLS: Yes** **OS: Yes**	**BLS: Yes** **OS: Yes**	**BLS: No** **OS: No**

Rationale

Main secondary species are blue shark (BLS) and ocean sunfish (OS), based on reported catch volumes and vulnerability.

Preliminary stock assessment work has been undertaken for blue shark, but this is not yet progressed to the extent that it can be used to inform management. In the ETBF risk assessment, this species scored medium. Measures, and a partial strategy, are in place such that the UoA is not expected to hinder recovery or rebuilding of this species population. Measures in place include a prohibition on wire traces in the fishery, requirement to handle released animals to promote their survival, requirement to carry line-cutting and dehooking gear aboard vessels, and an overall limit on shark captures per trip. For 2016-2018, 100% of blue sharks caught were reported to be discarded in logbooks. Monitoring catch records for this species to enable detection of any change in risk was recommended by the risk assessment process. SG60 and SG80 are met.

The ocean sunfish is considered likely to be above biologically based limits and is assessed as low risk in the ETBF. Fishing mortality has been assessed to be below the maximum sustainable. Almost all catch of this species is discarded, with handling requirements as described for blue sharks (to promote post-release survival). While not designed specifically to manage the UoA impacts on this species, fishing practices in place comprise a partial strategy that ensures the impact of the UoA would not hinder recovery or rebuilding, if the species was below biologically based limits. SG60 and SG80 are met.

It cannot be concluded based on current information that there is a high degree of certainty that these species are above biologically based limits. SG100 is not met.

	Minor secondary species stock status			
b	Guide post			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			**Yes**

Rationale

A diversity of minor secondary species is caught (or used as bait) in the ETBF. The status of most of these species in relation to biologically based limits is unknown. The ecological risk assessment process considers most of these species (Table 17). Secondary minor species that are not considered by the ecological risk assessment are caught in small quantities (Table 17) such that it is extremely unlikely that the UoA could hinder recovery and rebuilding, if stock status was below biologically based limits. Catch records comprise evidence of the ongoing UoA impact on these species. None of the species considered were evaluated as being at high risk in the most recent iteration of the risk assessment. However, some were assessed to be at medium risk. While there is uncertainty about biologically based limits, the risk assessment methodology applied over time evaluates changes in risk and therefore the possibility that the UoA could be hindering recovery and rebuilding. The findings of the latest iteration comprise evidence that this is not the case. SG100 is met.

References

Ducharme-Barth, N., Pilling, G. and Hampton, J. 2019. Stock assessment of SW Pacific striped marlin in the WCPO. WCPFC-SC15-2019/SA-WP-07. Scientific Committee, 15th Regular Session. Pohnpei, Federated States of Micronesia. 12 – 20 August 2019. Western and Central Pacific Fisheries Commission.

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2019. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Takeuchi, Y., Tremblay-Boyer, L. Pilling, G. and Hampton, J. 2016. Assessment of blue shark in the southwestern Pacific. WCPFC-SC12-2016/SA-WP-08 REV1. Western and Central Pacific Fisheries Commission 12th Regular Session. Bali, Indonesia. 3 – 11 August, 2016. Available at: https://www.wcpfc.int/doc/14/south-pacific-blue-shark [Accessed 8 November 2019]

Overall Performance Indicator score	90

PI 2.2.2 – Secondary species management strategy

PI 2.2.2		**There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **partial strategy** in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **strategy** in place for the UoA for managing main and minor secondary species.
	Met?	**BLS: Yes** **OS: Yes**	**BLS: Yes** **OS: Yes**	**BLS: Yes** **OS: No** **Minor: No**
Rationale				

Blue sharks (BLS):
Measures and a partial strategy are in place such that the UoA is not expected to hinder recovery or rebuilding of blue sharks (BLS). Measures in place include a prohibition on wire traces in the fishery (since 2005), requirement to handle released animals to promote their survival, requirement to carry line-cutting and dehooking gear aboard vessels and a trip limit on shark captures (overall). Monitoring catch records for this species to enable detection of any change in risk was recommended by the risk assessment process. SG60 and SG80 are met. Mechanisms exist by which fishing practices can be modified if unacceptable impacts are identified (e.g. specifying conditions in fishing permits). SG100 is met.

Ocean sunfish (OS):
The ocean sunfish was considered of low risk in the ecological risk assessment. Fishing mortality has been assessed to be below the maximum sustainable. Catch is reported by fishers and monitored using on-vessel cameras (thereby enabling catch verification), such that any increase in catch and risk would be detected. Almost all catch of this species is discarded, and handling requirements are in place such that post-release survival is promoted. On that basis, it is concluded that measures and a partial strategy are in place. SG60 and SG80 are met. A strategy is not in place, therefore SG100 is not met.

Minor species:
All main and minor species are considered for SG100. The ETBF Fishery Management Strategy sets out the management framework as relevant to secondary species, and this includes the application of the risk assessment method. Provision for general, species-group or species-specific management measures is also included. The strategy sets out review procedures (including timeframe) that apply if significant increases or decreases are identified in the risks of the ETBF to the species it interacts with. Case-specific measures to address impacts are set outside this framework, and do not apply to all main and minor species. SG100 is not met.

	Management strategy evaluation			
b	Guide post	The measures are considered **likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	**BLS: Yes** **OS: Yes**	**BLS: Yes** **OS: Yes**	**BLS: Yes** **OS: No** **Minor: No**
Rationale				

Blue sharks (BLS):
Wire traces were banned in this fishery in 2005. This prohibition occurred after quantitative evidence demonstrated that shark catch rates with monofilament traces were 30% lower than when wire traces were used. Testing has demonstrated the efficacy of this management measure. Post-release survival is documented in blue sharks, with condition at release appearing to be a key determinant of survival rate. Therefore, appropriate handling practices to promote survival are expected to be at least somewhat effective. For blue sharks, the requirements of SG60, SG80 and SG100 are met.

Ocean sunfish (OS)
Ocean sunfish are almost never retained, therefore catching this species is not incentivised. While post-release survival of ocean sunfish has not been quantified in a fishery context, live releases are reported from a range of fisheries and research tracking tagged individuals demonstrates that the species has some ability to survive capture, handling and release. There is some objective basis for confidence from the fishery and species that the partial strategy will work. SG60 and SG80 are met. Testing of the partial strategy has not occurred, therefore SG100 is not met.

Minor species:
A strategy is not in place for these species. Therefore, SG100 cannot be met.

	Management strategy implementation			
c	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its objective**

				as set out in scoring issue (a).
	Met?		**BLS: Yes** **OS: Yes**	**BLS: No** **OS: No** **Minor: No**
Rationale				

Blue sharks (BLS):
Prior to the implementation of electronic monitoring, information collected by human observers documented the traces used in fishing gear in the ETBF.

There is some evidence that the partial strategy for blue shark is being implemented successfully. When deployed on vessels prior to the introduction of electronic monitoring, fisheries observers collected information on the traces used. Since the implementation of electronic monitoring, imagery of shark handling and release has been reviewed as part of routine monitoring. SG80 is met.

The blue shark is evaluated as being at medium risk. While the strategy is in place, clear evidence is required that it is achieving its objective on an ongoing basis. SG100 is not met.

Ocean sunfish (OS):
Electronic monitoring is used to monitor catch handling practices implemented by crew, and inappropriate handling is treated as a compliance issue. Logbook data includes information about retained and discarded catch. There is some evidence that the partial strategy is being implemented successfully. SG80 is met. There is not clear evidence that the partial strategy is achieving its objective. Therefore, SG100 is not met.

Minor species:
A strategy is not in place for these species. Therefore, SG100 cannot be met.

d	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

The Fishery Management Strategy states that shark finning is prohibited in the ETBF. Permit conditions and documented management arrangements also specify that sharks must be landed intact (in cases where landing is permitted at all). Electronic monitoring is used to assess compliance with these requirements. SG60, SG80 and SG100 are met.

e	Review of alternative measures to minimise mortality of unwanted catch			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of all secondary species, and they are implemented, as appropriate.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

Measures to mitigate chondrichthyan bycatch have been reviewed in detail. This work is relevant to blue shark as a main secondary species, and the suite of chondrichthyans that are minor secondary species.

More broadly, in 2016 AFMA introduced a permit condition relating to handling unwanted catch, with the aim of increasing survival of discarded fish after release. This followed the introduction of electronic monitoring, which enabled catch handling to be reviewed across the fleet. Guidance on handling to promote the post-release survival of unwanted catch was also developed, including a publication and instructional video. SG60 is met.

The video on bycatch handling was re-released in 2018 on social media. Handling practices are reviewed on an ongoing basis, with analysts viewing electronic monitoring imagery highlighting incidents of inappropriate handling for appropriate follow-up by AFMA (including by compliance and enforcement staff). There is a requirement for all catch which is to be released or discarded to be handled within view of the electronic monitoring camera. In addition to reviewing handling of unwanted catch and implementing requirements to promote post-release survival when catch is discarded, a permit condition has been implemented that requires vessels to carry at least one dehooker and line-cutter.

Technical publications and reports provide additional evidence that measures to minimise the mortality of unwanted catch have been reviewed. SG80 and SG100 are met.

References

AFMA. Undated. Shark and ray handling practices: A guide for commercial fishers in southern Australia. Commonwealth of Australia.

AFMA. 2008. Ecological Risk Assessment: Residual Risk Assessment for Eastern Tuna and Billfish Fishery. July 2008. AFMA Management.

AFMA. 2019. Eastern Tuna and Billfish Fishery Management Arrangements Booklet 2019. Australian Fisheries Management Authority, Canberra.

AFMA. 2016b. Bycatch handling: AFMA bycatch handling and treatment guide 2016/17. Australian Fisheries Management Authority, Canberra.

AFMA. 2019. Eastern Tuna and Billfish Fishery: Fishery Management Strategy 2019 – 2023. AFMA, Canberra.

Campana, S.E., Joyce, W., Fowler, M. and Showell, M. 2016. Discards, hooking, and post-release mortality of porbeagle (*Lamna nasus*), shortfin mako (*Isurus oxyrinchus*), and blue shark (*Prionace glauca*) in the Canadian pelagic longline fishery. ICES Journal of Marine Science 73: 520-528.

Cartamil, D. and Lowe, C.G. 2004. Diel movement patterns of ocean sunfish *Mola mola* off southern California. Marine Ecology Progress Series 266: 245-253.

Musyl, M.K. and Gilman, E.L. 2018. Post-release fishing mortality of blue (*Prionace glauca*) and silky shark (*Carcharhinus falciformes*) from a Palauan-based commercial longline fishery. Reviews in Fish Biology and Fisheries 28: 567-586.

Patterson, H.M. and Tudman, M.J. 2009. Chondrichthyan guide for fisheries managers: A practical guide to mitigating chondrichthyan bycatch. Bureau of Rural Sciences and Australian Fisheries Management Authority, Canberra.

Pope, E.C., Hays, G.C., Thys, T.M., Doyle, T.K., Sims, D.W. Queiroz, N., Hobson, V.J., Kubicek, L. and Houghton, J.D.R. 2010. The biology and ecology of the ocean sunfish *Mola mola:* a review of current knowledge and future research perspectives. Reviews in Fish Biology and Fisheries: DOI 10.1007/s11160-009-9155-9.

Stobutzki, I., Lawrence, E., Bensley, N. and Norris, W. 2006. Bycatch mitigation approaches in Australia's Eastern Tuna and Billfish Fishery: Seabirds, turtles, marine mammals, sharks and non-target fish. WCPFC-SC2-2006/EB IP-4. Scientific Committee, 2nd Regular Session. Manila, Philippines. 7 – 18 August 2006. Western and Central Pacific Fisheries Commission.

Overall Performance Indicator score	90

PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is **adequate to estimate** the impact of the UoA on the main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and **adequate to assess** the impact of the UoA on main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and **adequate to assess with a high degree of certainty** the impact of the UoA on main secondary species with respect to status.
	Met?	**Yes**	**Yes**	**No**
Rationale				

An extensive body of qualitative and quantitative information is available for the ETBF. This includes detailed information about the fishery and its catch, as well as fishery-independent information on the catch species. Information on catch and life history characteristics allows an assessment of the risk that the fishery presents to main secondary species. SG60 and SG80 are met. However, information is not adequate to assess the impact of the UoA on main secondary species, with respect to status, with a high degree of certainty. SG100 is not met.

b	Information adequacy for assessment of impacts on minor secondary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			**Yes**
Rationale				

An extensive body of quantitative information on catch is available for the ETBF, and life history information is also available for secondary species. This allows a risk assessment to be conducted, and conclusions to be drawn about the risk that the fishery presents to minor secondary species. It is concluded that some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status. SG100 is met.

	Information adequacy for management strategy			
c	Guide post	Information is adequate to support **measures** to manage **main** secondary species.	Information is adequate to support a **partial strategy** to manage **main** secondary species.	Information is adequate to support a **strategy** to manage **all** secondary species, and **evaluate** with a **high degree of certainty** whether the strategy is **achieving its objective**.
	Met?	**Yes**	**Yes**	**No**

Rationale

Information relevant to managing the UoA impacts on main secondary species includes the volume and location of catch taken, and some information on fishing practices. The risk that the ETBF presents to main secondary species has been assessed, and life history characteristics of these species are broadly known. Some information is available on mitigation measures for chondrichthyans. Collectively, this information is sufficient to meet the requirements of SG80, i.e., adequately informing the development of a partial strategy to manage main secondary species.

A large number of secondary species are caught in the ETBF, and some bait species are also categorised as secondary minor species. Information appears inadequate to support a strategy to manage all secondary species, and to evaluate with a high degree of certainty whether it is achieving its objective. SG100 is not met.

References

Patterson, H.M. and Tudman, M.J. 2009. Chondrichthyan guide for fisheries managers: A practical guide to mitigating chondrichthyan bycatch. Bureau of Rural Sciences and Australian Fisheries Management Authority, Canberra.

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2019. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Overall Performance Indicator score	85

PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the **effects of the UoA** on the population/ stock are known and **likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population /stock are known and **highly likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits.
	Met?	**NA**	**NA**	**NA**
Rationale				

There are no national or international requirements that set limits for ETP species. This scoring issue is not applicable.

b	Direct effects			
	Guide post	Known direct effects of the UoA are likely to not **hinder recovery** of ETP species.	Direct effects of the UoA are **highly likely** to not **hinder recovery** of ETP species.	There is a **high degree of confidence** that there are no **significant detrimental direct effects** of the UoA on ETP species.
	Met?	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: No** **Seabirds: No** **ETP sharks, rays: No** **Marine mammals: No**
Rationale				

ETP species are considered in the ecological risk assessment conducted for this fishery. In the most recent assessment, five ETP species (all cetaceans) were initially assessed as high risk. This risk rating was reduced to low risk based on low levels of reported interactions. It is concluded that the direct effects of the UoA are highly likely to not hinder recovery of ETP species. SG60 and SG80 are met.

SG100 requires a high degree of confidence that there are no significant detrimental direct impacts of the UoA on ETP species. With the information currently available, SG100 is not met.

c	Indirect effects			
	Guide post		Indirect effects have been considered for the UoA and are thought to be **highly likely** to not create unacceptable impacts.	There is a **high degree of confidence** that there are no **significant detrimental indirect effects** of the UoA on ETP species.
	Met?		**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: No** **Seabirds: No** **ETP sharks, rays: No** **Marine mammals: No**

Rationale

The ecological risk assessment for the ETBF considers indirect effects of the UoA. For example, the effects of the UoA have been considered on assessed ETP species' food sources, habitat impacts, and ecosystem linkages. Indirect effects did not result in high risk scores for species considered in the risk assessment, however the limited information available on indirect effects was noted. It is concluded that SG80 is met. However, the information currently available on indirect effects precludes the high degree of confidence required to meet SG100.

References

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2019. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Overall Performance Indicator score	80

PI 2.3.2 – ETP species management strategy

PI 2.3.2		**The UoA has in place precautionary management strategies designed to:** - **meet national and international requirements;** - **ensure the UoA does not hinder recovery of ETP species.** **Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guide post	There are **measures** in place that minimise the UoA-related mortality of ETP species, and are expected to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **comprehensive strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to **achieve above** national and international requirements for the protection of ETP species.
	Met?	**NA**	**NA**	**NA**
Rationale				

This scoring issue is not applicable as there are no national or international limits set for ETP species.

b	Management strategy in place (alternative)			
	Guide post	There are **measures** in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **strategy** in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **comprehensive strategy** in place for managing ETP species, to ensure the UoA does not

				hinder the recovery of ETP species.
	Met?	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: No** **Seabirds: Yes** **ETP sharks, rays: No** **Marine mammals: No**
Rationale				

There are measures and a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species. Measures include prohibition of the retention of most ETP chondrichthyans (and restrictions prohibiting bringing live mako sharks aboard), and seabird and turtle bycatch mitigation measures (see section 7.3.1). It is a requirement that vessels carry dehooker and line-cutters, to release non-target catch such that post-capture is promoted. These requirements are reflected in permit conditions. Mandatory reporting requirements for ETP interactions are in place and monitoring of captures and releases occurs via on-vessel cameras. The review (and updating) of the ecological risk assessment evaluates impacts of the ETBF on ETP species over time and has been used as a framework underpinning the introduction of new management measures. Legislative provisions and the ETBF Fishery Management Strategy are additional elements of the strategic framework for the fishery. SG60 and SG80 are met.

A comprehensive strategy[20] is a complete and tested strategy comprising linked monitoring, analyses and management measures and responses. For seabirds, there is a comprehensive strategy in place to ensure the UoA does not hinder recovery. The Threat Abatement Plan is a key component of this and includes specifying a stepwise escalating management response to vessel-specific bycatch rates over time. These requirements were updated prior to the 2020 fishing season. SG100 is met. For other ETP species, SG100 is not met.

C	Management strategy evaluation			
	Guide post	The measures are **considered likely** to work, based on **plausible argument** (e.g., general experience, theory or comparison with similar fisheries/species).	There is an **objective basis for confidence** that the measures/strategy will work, based on **information** directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a **quantitative analysis** supports **high confidence** that the strategy will work.
	Met?	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: No** **Seabirds: Yes** **ETP sharks, rays: No** **Marine mammals: No**
Rationale				

The measures are considered likely to work for all ETP, based on plausible argument. SG60 is met. There is an objective basis for confidence in the efficacy of the measures/strategy. This includes the findings of quantitative research (e.g. mitigation measures that have been tested on the same species in other pelagic longline fisheries), and an understanding of the incentives for capturing some species (i.e. if retention for sale is prohibited, landings are not incentivised and targeted take is unlikely to occur). Information relating to the measures/strategy is derived from both the species and the fishery involved. SG60 and SG80 are met.

The strategy, and comprehensive strategy for seabirds, are mainly based on information directly about the fishery and/or species involved. Quantitative analysis demonstrates some efficacy of some of the strategic elements, while this is not the case for all (or to a level imparting high confidence). For

[20] MSC (2018) Table SA8

seabirds, quantitative analysis supports high confidence that the strategy will work. SG100 is therefore met for seabirds but not for other ETP species.

d	Management strategy implementation			
	Guide post		There is some **evidence** that the measures/strategy is being implemented successfully.	There is **clear evidence** that the strategy/comprehensive strategy is being implemented successfully and **is achieving its objective as set out in scoring issue (a) or (b).**
	Met?		**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: No** **Seabirds: No** **ETP sharks, rays: No** **Marine mammals: No**
Rationale				

Information collected by fisheries observers and electronic monitoring provides some evidence that the measures/strategy is being implemented successfully, e.g. the use of some mitigation methods, sharks released in the water or not landed. Changes in the risk assigned to species considered in the ecological risk assessment may also reflect the implementation of the strategy. SG80 is met across ETP species.

Fishery monitoring provides clear evidence that the strategy/comprehensive strategy is being implemented successfully. The risk assessment provides some evidence that the strategy/comprehensive strategy is achieving its objective, in that there are no ETP species for which the assessed risk is considered high and this relative risk is assessed iteratively over time. However, further information is required to conclude that the strategy/comprehensive strategy is achieving its objective for ETP (as set out in scoring issue (b)). SG100 is not met.

e	Review of alternative measures to minimize mortality of ETP species			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**
Rationale				

Measures for minimising the mortality of ETP species are reviewed regularly (see references below). Over time, the introduction of new measures to reduce ETP mortalities is evident in the fishery. For example, the use of wire traces was banned in the fishery in 2005, the prohibition on landing oceanic whitetip and silky sharks was adopted, and mandatory and seabird turtle bycatch mitigation measures have been introduced. Dehookers and line-cutters must be carried aboard vessels for use when releasing unwanted catch. More recently, regulated options for seabird bycatch reduction have been broadened to include hook shielding devices, and the fishery is covered by WCPFC Conservation and Management Measure 2019-05 relating to the handling of giant manta rays (in force from 1 January 2021).

In addition to reviews specific to species- or species-groups (such as those set out in the References below), review of catch handling practices observed in electronic monitoring imagery occurs to ensure the adoption of handling methods that promote the survival of released ETP. This review takes place on an ongoing basis as a routine part of fishery monitoring.

Ongoing review of the potential effectiveness and practicality of measures to minimise mortality of ETP species, and their implementation as appropriate, are evident. SG60, SG80 and SG100 are met.

References

AFMA. Undated. Shark and ray handling practices: A guide for commercial fishers in southern Australia. Commonwealth of Australia.

AFMA. 2008. Ecological Risk Assessment: Residual Risk Assessment for Eastern Tuna and Billfish Fishery. July 2008. AFMA Management.

AFMA. 2012. Ecological Risk Management Report for the Eastern Tuna and Billfish Fishery - April 2012.

AFMA. 2019. Eastern Tuna and Billfish Fishery: Fishery Management Strategy 2019 – 2023. AFMA, Canberra.

AFMA. 2019. Eastern Tuna and Billfish Fishery Management Arrangements Booklet 2020. Australian Fisheries Management Authority, Canberra.

Campana, S.E., Joyce, W., Fowler, M. and Showell, M. 2016. Discards, hooking, and post-release mortality of porbeagle (*Lamna nasus*), shortfin mako (*Isurus oxyrinchus*), and blue shark (*Prionace glauca*) in the Canadian pelagic longline fishery. ICES Journal of Marine Science 73: 520-528.

Commonwealth of Australia. 2018. Threat Abatement Plan for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations (2018), Department of the Environment and Energy, Canberra.

Hutchinson, M. and Bigelow, K. 2019. Quantifying post release mortality rates of sharks incidentally captured in Pacific tuna longline fisheries and identifying handling practices to improve survivorship. WCPFC-SC15-2019/EB-WP-04 (Rev.01). Scientific Committee, 15th Regular Session. Pohnpei, Federated States of Micronesia. 12 – 20 August 2019. Western and Central Pacific Fisheries Commission.

Musyl, M.K. and Gilman, E.L. 2018. Post-release fishing mortality of blue (*Prionace glauca*) and silky shark (*Carcharhinus falciformes*) from a Palauan-based commercial longline fishery. Reviews in Fish Biology and Fisheries 28: 567-586.

Patterson, H.M. and Tudman, M.J. 2009. Chondrichthyan guide for fisheries managers: A practical guide to mitigating chondrichthyan bycatch. Bureau of Rural Sciences and Australian Fisheries Management Authority, Canberra.

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2019. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Stobutzki, I., Lawrence, E., Bensley, N. and Norris, W. 2006. Bycatch mitigation approaches in Australia's Eastern Tuna and Billfish Fishery: Seabirds, turtles, marine mammals, sharks and non-target fish. WCPFC-SC2-2006/EB IP-4. Scientific Committee, 2nd Regular Session. Manila, Philippines. 7 – 18 August 2006. Western and Central Pacific Fisheries Commission.

WCPFC. 2009. WCPFC Guidelines for the handling of sea turtles. Available at: https://www.wcpfc.int/node/2010 [Accessed 27 February 2020].

WCPFC. 2017. Best handling practices for the safe release of mantas and mobulids. WCPFC Summary Report Attachment P. WFPF Commission 14th Regular Session. Manila, Philippines.

Overall Performance Indicator score	85

PI 2.3.3 – ETP species information

PI 2.3.3		**Relevant information is collected to support the management of UoA impacts on ETP species, including:** - **Information for the development of the management strategy;** - **Information to assess the effectiveness of the management strategy; and** - **Information to determine the outcome status of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is **adequate to estimate** the UoA related mortality on ETP species. **OR** **If RBF is used to score PI 2.3.1 for the UoA:** Qualitative information is **adequate to estimate productivity and susceptibility** attributes for ETP species.	Some quantitative information is **adequate to assess** the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. **OR** **If RBF is used to score PI 2.3.1 for the UoA:** Some quantitative information is **adequate to assess productivity and susceptibility attributes** for ETP species.	Quantitative information is available to assess with a high degree of certainty the **magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status** of ETP species.
	Met?	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: No** **Seabirds: No** **ETP sharks, rays: No** **Marine mammals: No**
Rationale				

Quantitative information includes logbook information, which can be verified using data collected by human observers and electronic monitoring. Electronic monitoring also provides some ability to assess life status of captured ETP. Further, after identification issues were detected following the deployment of electronic monitoring, a feather sampling protocol was introduced for seabirds captured dead, to enable DNA identification. Together with the broader information base available on ETP species (e.g. life history characteristics), information is adequate to determine whether the UoA may be a threat to the protection and recovery of ETP species. The ecological risk assessment conducted for the ETBF is a key tool in this regard. Overall, quantitative information is adequate to assess the UoA related mortality and to determine whether the UoA may be a threat to protection and recovery of the ETP species. SG60 and SG80 are met.

Information is not sufficient to assess the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status for all ETP, with a high degree of certainty. SG100 is not met.

b	Information adequacy for management strategy			
	Guide post	Information is adequate to support **measures** to manage the impacts on ETP species.	Information is adequate to measure trends and support a **strategy** to manage impacts on ETP species.	Information is adequate to support a **comprehensive strategy** to manage impacts, minimize mortality and injury of ETP species, and evaluate with a **high degree of certainty** whether a strategy is achieving its objectives.
	Met?	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: Yes** **Seabirds: Yes** **ETP sharks, rays: Yes** **Marine mammals: Yes**	**Turtles: No** **Seabirds: No** **ETP sharks, rays: No** **Marine mammals: No**

Rationale

A substantial body of information is available on ETP species, that is relevant to the management of their interactions with the UoA. This includes information on the species themselves, catch information, and measures (some of which are very well tested) to avoid and mitigate captures. For some species and species groups, information is also available on post-capture mortality rates. Catch information reported in logbooks is verifiable, using data collected by human observers and electronic monitoring systems which include cameras.

Information is adequate to measure trends and support measures and a strategy to manage impacts on ETP species. SG60 and SG80 are met.

Information is not adequate to support a comprehensive strategy for all ETP species (including indirect impacts), and provide a high certainty that it is achieving its objectives. SG100 is not met.

References

AFMA. 2019. Eastern Tuna and Billfish Fishery Management Arrangements Booklet 2019. Australian Fisheries Management Authority, Canberra.

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2019. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Overall Performance Indicator score	80

PI 2.4.1 – Habitats outcome

PI 2.4.1	**The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates**		
Scoring Issue	SG 60	SG 80	SG 100
a	Commonly encountered habitat status		
	Guide post	The UoA is **unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would	The UoA is **highly unlikely** to reduce structure and function of the commonly encountered habitats to a	There is **evidence** that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a

		be serious or irreversible harm.	point where there would be serious or irreversible harm.	point where there would be serious or irreversible harm.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

The fishery is conducted with pelagic longline gear, between depths of 30 to 500 m. By definition, pelagic longline gear does not contact the sea floor, and the fishery targets species that occur in the water column not in demersal habitats (see Figure 31). Therefore, commonly encountered habitats are pelagic waters only. The gear passes through these habitats on shooting and hauling and remains in situ during the set. The gear has no long-term impacts on these habitats after it is hauled, unless it is lost. Prior to the introduction of electronic monitoring, observers collected information on the amount of gear lost. It is not considered to be high, and GPS beacons aid recovery of large segments that break off. If lost, gear would continue to drift until it moved out of commonly encountered habitats (see minor habitats, below) or was retrieved. Therefore, based on its fishing method, the UoA operates such that it cannot reduce the structure and function of commonly encountered habitats to a point where there would be serious or irreversible harm.

Further, the ETBF risk assessment considered impacts of the fishery on habitats. These were eliminated at the first stage of this assessment, due to the nature of the fishing method.

There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

b	VME habitat status			
	Guide post	The UoA is **unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is **highly unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	**NA**	**NA**	**NA**
Rationale				

The UoA has no contact with VME habitats, because gear operates in pelagic waters. This scoring issue is not scored.

c	Minor habitat status			
	Guide post			There is **evidence** that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?			**Yes**
Rationale				

The gear does not interact with habitats beyond those commonly encountered (i.e. pelagic waters, considered in scoring issue (a)), unless it is lost in the course of fishing. Gear loss in this fishery is not considered to be high. Lost gear may be carried into other habitats, for example, though steel hooks will eventually rust over time. The effects of any lost gear are considered highly unlikely to reduce the

structure and function of minor habitats to a point where there would be serious or irreversible harm. SG100 is met.

References

AFMA. 2019. Eastern Tuna and Billfish Fishery Management Arrangements Booklet 2019. Australian Fisheries Management Authority, Canberra.

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2019. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Overall Performance Indicator score	100

PI 2.4.2 – Habitats management strategy

PI 2.4.2		**There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a **strategy** in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	**Yes**	**Yes**	**No**
Rationale				

The pelagic longline method has no lasting effects on marine habitats, with the exception of lost gear. The gear is not anchored, and drifts in the ocean after it is set (see Figure 31). The operational method itself comprises a partial strategy that is expected to achieve the Habitat Outcome 80 level of performance or above. SG60 and SG80 are met.

SG100 requires consideration of the management of gear loss[21]. There does not appear to be a strategy in place that addresses gear loss. SG100 is not met.

b	Management strategy evaluation			
	Guide post	The measures are **considered likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some **objective basis for confidence** that the measures/partial strategy will work, based on **information directly about the UoA and/or habitats** involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on **information directly about the UoA and/or habitats** involved.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

The pelagic longline method is designed for use in open waters, and to not contact the seafloor. This fishing method is well-established. Further, the species it targets are not demersal. The ongoing use of

[21] MSC (2018) Table GSA8

this method by the fishery (which is monitored, e.g. by on-vessel cameras) provides high confidence that the partial strategy will work to manage habitat impacts. SG100 is met.

c	Management strategy implementation			
	Guide post		There is **some quantitative evidence** that the measures/partial strategy is being implemented successfully.	There is **clear quantitative evidence** that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		**Yes**	**No**
Rationale				

Monitoring of fishing operations relevant to implementation of the partial strategy for habitat impacts has been achieved using human observers and on-vessel cameras. Gear use other than the pelagic longline method would be readily detected monitoring. In cases of double breakoffs, the recovery of long lengths of gear is assisted by GPS beacons. The amount of gear lost in the fishery is considered to be low. There is some quantitative evidence that the measures/partial strategy is being implemented successfully and SG80 is met.

However, given the lack of detailed quantitative information on lost gear, it cannot be concluded that there is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a). SG100 is not met.

d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs			
	Guide post	There is **qualitative evidence** that the UoA complies with its management requirements to protect VMEs.	There is **some quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is **clear quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	**NA**	**NA**	**NA**
Rationale				

This scoring issue is not scored, as the UoA operates using pelagic fishing gear.

References

Overall Performance Indicator score	85

PI 2.4.3 – Habitats information

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	The types and distribution of the main habitats are **broadly understood**. **OR** **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and **vulnerability** of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. **OR** **If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	**Yes**	**Yes**	**No**
Rationale				

The nature, distribution and vulnerability of habitats in the UoA area are known, at a level relevant to UoA activities. The UoA operates in pelagic waters (therefore these are the main habitats). SG60 and SG80 are met.

Minor habitats affected by gear lost from this fishery (beyond pelagic waters) are unknown, and their distribution cannot be considered based on current information. Therefore, it cannot be concluded that the distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats. SG100 is not met.

b	Information adequacy for assessment of impacts			
	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR **If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to	The physical impacts of the gear on all habitats have been quantified fully.

			estimate the consequence and spatial attributes of the main habitats.	
	Met?	**Yes**	**Yes**	**No**

Rationale

Information available from the UoA includes spatial and temporal data on fishing activity, which enables identification of the areas fished (i.e. where and when direct habitat impacts occur). Data includes information received from Vessel Monitoring Systems and recorded by electronic monitoring systems (time, date, location and activity information). SG60 and SG80 are met.

The habitat impacts of pelagic longline gear are not well documented, including for lost gear, (including in the UoA area). The physical impacts of the gear on all habitats have not been quantified fully. SG100 is not met.

	Monitoring			
C	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		**Yes**	**No**

Rationale

The spatial and temporal characteristics of fishing activity are documented through Vessel Monitoring Systems and electronic monitoring. This information is adequate to detect any increase in risk to the main habitats. SG80 is met.

Changes in some habitat distributions are documented over time (e.g. changing temperature profiles that characterise pelagic waters). However, changes in the distribution of all habitats are not measured over time. SG100 is not met.

References

AFMA. 2019. Eastern Tuna and Billfish Fishery Management Arrangements Booklet 2019. Australian Fisheries Management Authority, Canberra.

Macfayden, G., Huntington, T. and Cappell, R. 2009. Abandoned, lost or otherwise discarded fishing gear. FAO Fisheries and Aquaculture Technical Paper No. 523, UNEP Regional Seas Reports and Studied No. 185. FAO, Rome.

Overall Performance Indicator score	80

PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is **unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is **highly unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	**Yes**	**Yes**	**Partial**

Rationale

Key oceanographic influences on the ecosystem in which the fishery operates are the East Australian Current and the three currents that it gives rise to, that broadly flow eastwards. The fishery will have no impact on these oceanographic features.

Direct take is the main influence of the fishery on the ecosystem's components. The impacts of the fishery on communities, habitats and species have been assessed using a risk assessment approach. Habitat impacts are considered of low risk. Species-specific impacts are considered in more detail elsewhere in this assessment (e.g. for secondary species and ETP). In summary, eight species were assessed as being high risk but after additional information was considered, the residual risk was downgraded. Relatively lower levels of knowledge on community impacts of fishing on lower trophic levels and species that compete with the target species were identified for offshore oceanic communities and seamount communities in the ETBF risk assessment. However, modelling work has not predicted disruption of elements underlying ecosystem structure and function to the point of serious or irreversible harm.

For communities, the use of imported baits was identified as a major risk in the ETBF risk assessment. This reflects possible linkages between epizootics in wild Australian *Sardinops* populations and imported *S. sagax* baits. While severe, it appears that the mass mortalities caused by these events did not result in serious or irreversible harm. Import conditions are in place to manage the biodiversity risk associated with bait imports (e.g., bait must not carry visible lesions). However, concerns about this major risk remain and effects would vary in severity, depending on the organism introduced and sensitivities of the new host communities.

The UoA is considered highly unlikely to disrupt the key elements underlying the ecosystem structure and function to a point where there would be a serious or irreversible harm. SG60 and SG80 are met.

Based on lower levels of knowledge on some community impacts and biosecurity risks associated with imported baits, it cannot be concluded that there is evidence that the UoA is highly unlikely to disrupt any of the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. SG100 is met in part.

References

AFMA. 2017a. Fisheries Management Paper 14. AFMA's Ecological Risk Management. June 2017. Available at: https://www.afma.gov.au/sites/default/files/uploads/2017/09/Attachment-A-ERM-FMP.pdf [Accessed 8 November 2019]

Commonwealth of Australia. 2014. Assessment of the Eastern Tuna and Billfish Fishery: August 2014. Department of the Environment.

Department of Agriculture. 2020. Import conditions: Bony fish and cephalopods for bait or fish food. Effective: 22 February 2020. Australian Government. Accessible at: https://bicon.agriculture.gov.au/BiconWeb4.0/ImportConditions/Conditions?EvaluatableElementId=439366&Path=UNDEFINED&UserContext=External&EvaluationStateId=8fd9b337-7617-43e4-ae6b-24d7c6a44393&CaseElementPk=1245109&EvaluationPhase=ImportDefinition&HasAlerts=False&HasChangeNotices=False&IsAEP=False [Accessed 26 February 2020]

Gaughan, D.J. 2002. Disease-translocation across geographic boundaries must be recognized as a risk even in the absence of disease identification: the case with Australian *Sardinops.* Reviews in Fish Biology and Fisheries 11: 113 – 123.

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2019. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Young, J.W., Lansdell, M.J., Hobday, A.J., Dambacher, J.M., Griffiths, S.P., Cooper, S.P., Kloser, R.J., Nichols, P.D. and Revill, A.T. 2009. Determining ecological effects of longline fishing in the Eastern Tuna and Billfish Fishery. FRDC Final Report 2004/063.

Overall Performance Indicator score	90

PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		**There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary which take into account the **potential impacts** of the UoA on key elements of the ecosystem.	There is a **partial strategy** in place, if necessary, which takes into account **available information and is expected to restrain impacts** of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a **strategy** that consists of a **plan**, in place which contains measures to **address all main impacts of the UoA** on the ecosystem, and at least some of these measures are in place.
	Met?	**Yes**	**Yes**	**No**
Rationale				

The ecological risk assessment is a key element of the management framework used to evaluate the impacts of fishing on ecosystem components and is central to AFMA's progression towards ecosystem-based fisheries management. Measures to address impacts are developed when this assessment identifies the risk to an ecosystem component is high. The risk assessment takes into account available information, and previous iterations of this demonstrate how it leads to management measures that restrain impacts of the UoA on the ecosystem. A suite of measures is in place in the ETBF to reduce the ecosystem impacts of the fishery. These largely apply to particular species or species groups (e.g. management measures for seabirds, sharks and marine turtles). Marine protected areas are another element of the partial strategy in place in the area of UoA operation.

Therefore, there are measures and a partial strategy in place, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance. SG60 and SG80 are met.

While import conditions are in place, the biosecurity risk presented by the use of imported baits was identified as major in the most recent risk assessment. This does not appear to be addressed by the UoA. SG100 is not met.

	Management strategy evaluation			
b	Guide post	The **measures** are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is **some objective basis for confidence** that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	**Testing** supports **high confidence** that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

Management measures to address impacts of the ETBF on the ecosystem include some that are well-tested and shown to be effective (e.g. measures used to reduce seabird and turtle captures, prohibition on wire traces to reduce shark captures, post-captured mortality estimates after live release of some species). The regular updating of the ecological risk assessment provides insight into the efficacy of management of the different ecosystem components, including species, communities and habitats, effectively evaluating whether the management in place is addressing risks identified over time. The risk assessment process considers a substantial body of information derived from the ETBF and the region it operates in, as well as information that may have arisen elsewhere on the species interaction with the ETBF (e.g. non-target and ETP species). The measures are therefore likely to work based on plausible argument, and SG60 is met. There is also some objective basis for confidence that the partial strategy will work, based on information about both the UoA and the ecosystem involved. SG80 is met.

Regular review of the risk assessment provides an evaluation of the partial strategy's efficacy. Further, scientific evidence demonstrates the efficacy of most management measures in place. The management response to the identification of unacceptable impacts (e.g. for seabirds) provides additional confidence that the partial strategy will work. SG100 is met.

	Management strategy implementation			
c	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its objective as set out in scoring issue (a).**
	Met?		**Yes**	**No**
Rationale				

Evidence of implementation of the measures/partial strategy is collected through monitoring the fishery and assessing fishery performance. This has been achieved over time using information collected by human observers, through electronic monitoring, and through analysis of catch reporting (e.g. logbook information). The performance of the fishery is reported on through multiple channels, including at RFMO meetings (WCPFC, CCSBT). These multilateral fora also evaluate reported information on compliance with the required management measures, which include some relevant to ecosystem impacts. SG80 is met.

The iterations of the ecological risk assessment evaluate risks to communities, habitats and species within ecosystems over time. Broadly, this evaluation provides information on whether the management measures in place are effectively addressing their objectives (or at least not hindering

the achievement of those objectives). There is clear evidence that the partial strategy/strategy is being implemented successfully. However, it is less clear that it is achieving its objective as set out in scoring issue (a). SG100 is not met.

References

AFMA. 2019. Eastern Tuna and Billfish Fishery Management Arrangements Booklet 2019. Australian Fisheries Management Authority, Canberra.

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2019. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Young, J.W., Lansdell, M.J., Hobday, A.J., Dambacher, J.M., Griffiths, S.P., Cooper, S.P., Kloser, R.J., Nichols, P.D. and Revill, A.T. 2009. Determining ecological effects of longline fishing in the Eastern Tuna and Billfish Fishery. FRDC Final Report 2004/063.

Overall Performance Indicator score	85

PI 2.5.3 – Ecosystem information

PI 2.5.3		**There is adequate knowledge of the impacts of the UoA on the ecosystem**		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to **identify** the key elements of the ecosystem.	Information is adequate to **broadly understand** the key elements of the ecosystem.	
	Met?	**Yes**	**Yes**	
Rationale				

A substantial body of information is available on the key elements of the ecosystem, and this is adequate to broadly understand the key elements, e.g. their trophic level and function. This is reflected, for example, in the ecosystem modelling that has been undertaken.

SG60 and SG80 are met.

b	Investigation of UoA impacts			
	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but **have not been investigated** in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and **some have been investigated in detail**.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and **have been investigated in detail**.
	Met?	**Yes**	**Yes**	**No**
Rationale				

The main impacts of the UoA on key ecosystem elements can be inferred from the extensive information base accumulated on this fishery and the ecosystem that hosts it. Some impacts have

been investigated in detail. For example, ecosystem modelling has been conducted to examine the ecological impacts of fishing in the ETBF. A substantial body of information was considered in that work including detailed information on some ecosystem components. The effects of climate change on the ETBF have been considered. SG60 and SG80 are met.

Relatively less information is available on the UoA impacts on some ecosystem elements, for example, species occupying lower trophic levels and competitors of some target species, in offshore oceanic and seamount communities. It cannot be concluded that these interactions have been investigated in detail. SG100 is not met.

	Understanding of component functions			
c	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are **known**.	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are **understood**.
	Met?		**Yes**	**Yes**
Rationale				

The main function of the components in the ecosystem are known, from information collected in the region in which the UoA operates and beyond it (for wider-ranging species). This information is considered in analyses of food webs, for example. SG80 is met.

The impacts of the UoA on the target species, primary, secondary and ETP species, and habitats are identified, for example through the suite of data collection that occurs in the fishery, and in the risk assessment process. The main functions of these ecosystem components are broadly understood, for example, through the collection of biological and ecological information over time in this fishery and elsewhere where these species occur. SG100 is met.

	Information relevance			
d	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components **and elements** to allow the main consequences for the ecosystem to be inferred.
	Met?		**Yes**	**No**
Rationale				

The impact of the UoA on ecosystem components is evaluated in the risk assessment process. Where impacts are identified, ecosystem consequences can be considered, informed by ecosystem models developed for the ETBF and the region it operates within. Adequate information is available on the impacts of the UoA on the ecosystem components, but not all elements. SG80 is met, while SG100 is not.

	Monitoring			
e	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies

				to manage ecosystem impacts.
	Met?		**Yes**	**Yes**

Rationale

Ongoing data collection includes information about the fishery, such as documenting target, non-target (primary and secondary species catch), and ETP catch, the location of fishing activity and fishing effort. This is considered adequate to detect any increase in risk level, and the risk assessment process is iterative in considering such information. SG80 is met.

Overall, an extensive body of information is available on the ETBF and the ecosystem that it occurs within. This body of information, together with reviews of the ecological risk assessment and ongoing evaluations of the fishery's performance, provide adequate information to support the development of strategies to manage ecosystem impacts. SG100 is met.

References

Fulton, E.A., Hobday, A.J., Pethybridge, H., Blanchard, J., Bulman, C., Butler, I., Cheung, W., Gorton, B., Hutton, T., Lozano-Montes, H., Matear, R., Pecl, G., Villanueva, C. and Zhang, X. 2017. Decadal scale projection of changes in Australian fisheries stocks under climate change. Fisheries Research and Development Corporation. Available at: http://www.frdc.com.au/Archived-Reports/FRDC%20Projects/2016-139-DLD.PDF [Accessed 8 November 2019]

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2019. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Young, J.W., Lansdell, M.J., Hobday, A.J., Dambacher, J.M., Griffiths, S.P., Cooper, S.P., Kloser, R.J., Nichols, P.D. and Revill, A.T. 2009. Determining ecological effects of longline fishing in the Eastern Tuna and Billfish Fishery. FRDC Final Report 2004/063.

Overall Performance Indicator score	85

7.3 Principle 3

7.3.1 Principle 3 background

The ETBF targets stocks of highly migratory species including Yellowfin Tuna, Albacore Tuna, Bigeye Tuna, Broadbill Swordfish and Striped Marlin located within both the Australian Fishing Zone (AFZ) and the Western Central Pacific Ocean (WCPO). The target species are therefore subject to both national and regional fisheries management measures and policy and is jointly managed by the Australian Fisheries Management Authority (AFMA) and the Western Central Pacific Fisheries Commission (WCPFC). Southern Bluefin Tuna (SBT) is also targeted by ETBF vessels but this component is managed under the SBT Fishery management framework.

7.3.2 Governance and Policy

National Legislation

The Offshore Constitutional Settlement (OCS) sets out arrangements between the different Australian jurisdictions regarding responsibilities for fisheries. Under the OCS, the Australian states and the Northern Territory manage fisheries out to 3 nautical miles from the coast, and for the Australian Government to manage fisheries from three to 200 nautical miles (which is the extent of Australia's Exclusive Economic Zone (EEZ)). The settlement is not set out in one single document but is found in the legislation that implements it. The OCS arrangements provide a mechanism for the Commonwealth, the States and the NT to adjust these arrangements by passing management responsibility for particular fisheries exclusively to the Commonwealth or to the adjacent States/Northern Territories (NT); or alternatively, for the Commonwealth and the States/NT to jointly manage a fishery in waters relevant to the Commonwealth and one or more States/NT (Borthwick, 2012). These are binding arrangements requiring both State and Commonwealth to implement fisheries management arrangements in their respective jurisdictions.

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) is the Australian Government's (Commonwealth) central piece of environmental legislation. The EPBC Act is administered by the Commonwealth Department of Agriculture, Water and the Environment (DAWE, formerly the Department of Environment and Energy (DoEE)) and provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places — defined in the EPBC Act as matters of national environmental significance. The DAWE is responsible for acting on international obligations on a national level, by enacting policy and/or legislation to implement strategies to address those obligations.

The DAWE, through the Commonwealth Minister, has a legislative responsibility under the EPBC Act, to ensure that all managed fisheries undergo strategic environmental impact assessment before new management arrangements are brought into effect; and all fisheries in Australia from which product is exported undergo assessment to determine the extent to which management arrangements will ensure the fishery is managed in an ecologically sustainable way in the long term. The ETBF has been assessed using the Australian National ESD Framework for fisheries, in particular, the Guidelines for the Ecologically Sustainable Management of Fisheries, 2007 (DoEE, 2007). The ESD includes the principles of ecologically sustainable target and bycatch species, ecological viability of bycatch species, and impact of the broader marine ecosystem.

The DAWE (formerly the Department of Agriculture) are also responsible for the broader fishery policy, international negotiations and strategic issues. Key aspects of the policy framework for Commonwealth fisheries are articulated in:

- Commonwealth Fisheries Harvest Strategy Policy (DAWR, 2018a); and
- Commonwealth Fisheries Bycatch Policy 2018 (DAWR, 2018b).

The day-to-day management of Commonwealth fisheries, including the ETBF, is vested with the Australian Fisheries Management Authority (AFMA) that is established under the *Fisheries Administration Act 1991* (FAA). The FAA outlines AFMA's functions and responsibilities. AFMA manages Commonwealth Fisheries in accordance with the *Fisheries Management Act 1991* (FMA) and *Fisheries Management Regulations 2019*.

The legal rights for people dependent on fishing for food (non-commercial use) is enshrined in the *Native Title Act 1993*. This allows special provision for 'traditional fishing' to be made where they might apply in the context of both Commonwealth and State Fisheries Law. Further, following the passing of the Fisheries Legislation Amendment (Representation) Act 2017 in November 2017, AFMA is explicitly required to have regard to the interests of commercial, recreational and Indigenous fishing sectors in managing Australian fisheries.

International agreements and regional requirements

Commonwealth fisheries legislation requires that AFMA fisheries comply with relevant international fisheries agreements and conventions to which Australia is a signatory. Many of the key commercial, byproduct and bycatch species caught in the ETBF are highly migratory and their stocks or populations often span both high seas areas and the EEZs of many Pacific countries. For this reason, the management of these stocks requires international cooperation. The regional fisheries and marine management agreements, some of which establish Regional Fisheries Management Organisations, that are relevant to the ETBF and Southern Bluefin Tuna include:

- United Nations Agreement for the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995;
- Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western Central Pacific Ocean (WCPF Convention);
- Convention for the Conservation of Southern Bluefin Tuna;
- South Pacific Forum Fisheries Agency Convention;
- United Nations Convention on the Law of the Sea (UNCLOS) 1982;
- FAO Code of Conduct for Responsible Fisheries 1995;
- Convention on Biological Diversity;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- United Nations Fish Stocks Agreement (FSA); and
- State Member of the International Union for Conservation of Nature.

The Western and Central Pacific Fisheries Commission (WCPFC) was established under the WCPF Convention to facilitate the cooperative management of tuna and billfish fisheries in the Western Central Pacific Ocean (WCPO) and is made up of a large number of member countries, of which Australia is one. The WCPFC meets annually in December to review the catch, effort and scientific information for all member countries and to identify and implement management measures required to achieve the sustainable harvest and conservation of the targeted fish stocks and ecologically related species. AFMA must implement any fisheries measures agreed by WCPFC, including any catch limit for ETBF species. AFMA must also consider any rules or management arrangements (Resolutions, and Conservation and Management Measures (CMMs)), of the WCPFC in developing management arrangements for the ETBF (see Table 24). CMMs, for example, are implemented through SFR permit conditions which are updated after the Commission meeting.

Table 24. List of all current Conservation and Management Measures and Resolutions of the Western and Central Pacific Fisheries Commission relevant to this fishery (as of 2 May 2019).

CMM Reference	Title
2004-03	Specifications for the Marking and Identification of Fishing Vessels
Res. 2005-03	Resolution on Non-Target Fish Species
2006-04	Conservation and Management Measure for Striped Marlin in the Southwest Pacific
2006-07, 2007-01	Conservation and Management Measure for the Regional Observer Program
2006-08	Western and Central Pacific Fisheries Commission Boarding and Inspection Procedures
2008-03	Conservation and Management of Sea Turtles
Res. 2008-01	Resolution on Aspirations of SIDS and Territories
2009-03	Conservation and Management Measure for Swordfish
2009-06	Conservation and Management Measure on the Regulation of Trans shipment
2009-09	Conservation and Management Measure for Vessels without nationality
2010-06	Conservation and Management Measure to Establish a List of Vessels Presumed to have carried out Illegal, Unreported and Unregulated Fishing activities in the WCPO
2010-07	Conservation and Management Measure for Sharks
2011-04	Conservation and Management Measure for Oceanic Whitetip Sharks
Res. 2012-01	Resolution on the best available science
2013-04	Conservation and Management Measure for WCPFC Implementation of a Unique Vessel Identifier (UVI)
2013-05	Conservation and Management Measure on daily catch and effort reporting
2013-07	Conservation and Management Measure on the special requirements of Small Island Developing States and Territories
2013-08	Conservation and Management Measure for Silky Sharks
2014-05	Conservation and Management Measures for Sharks *(This CMM does not replace or prejudice any other existing shark CMM)*
2014-06	Conservation and Management Measures to develop and implement a harvest strategy approach for key fisheries and stocks in the WCPO
2015-02	Conservation and Management Measure for South Pacific Albacore
Res. 2017-01	Resolution on Provisional Application of CMM 2017-01
2017-02	Conservation and Management Measure on Minimum standards for Port State Measures
2017-03	Conservation and Management Measure for the protection of WCPFC Regional Observer Program Observers ((Replaced CMM 2016-03 (2017))
2017-04	Conservation and Management Measure on Marine Pollution
Res. 2018-01	Resolution on Labour Standards for Crew on Fishing Vessels
2018-01	Conservation and Management Measure for bigeye, yellowfin and skipjack tuna in the Western and Central Pacific Ocean
2018-03	Conservation and Management Measure to mitigate the impact of fishing for highly migratory fish stocks on seabirds

2018-05	Conservation and Management Measure for the Regional Observer Program
2018-06	Conservation and Management Measure for WCPFC Record of Fishing Vessels and Authorisation to Fish
2018-07	Conservation and Management Measure for Compliance Monitoring Scheme

The ETBF also interacts with southern bluefin tuna and Australia must also abide by measures adopted by the Commission for the Conservation of Southern Bluefin Tuna (CCSBT). All longline management measures of CCSBT must be implemented by the ETBF. Management plans and other policy measures for Commonwealth fisheries incorporate the conservation measures adopted by both CCSBT and WCPFC.

The Pacific Islands Forum Fisheries Agency (FFA) was established in 1979 by the South Pacific Forum Fisheries Agency Convention. The FFA facilitates regional co-operation and co-ordination on fisheries policies between its member states in order to achieve conservation and optimum utilisation of living marine resources, in particular highly migratory fish stocks. The FFA also coordinates multilateral compliance operations throughout the Pacific.

Consultation and interest groups

The consultation arrangements for this fishery consist of several different forums (both statutory and informal) depending on the issue. Statutory consultation for the determination of management plans is prescribed in Section 17 of the FMA. The *ETBF Management Plan 2010* prescribes the consultation that must be conducted in determining the TACC. AFMA must consult with the Tropical Tuna Management Advisory Committee (TTMAC) which is the major source of advice to AFMA, reflecting the experience and expertise of the range of stakeholders with interest in the fishery.

The TTMAC is the advisory body for the ETBF and the committee includes representatives from AFMA, industry, scientific agencies, environmental non-government organisations, the recreational/charter fishing sector and state government. Two meetings are held each year to discuss any problems relating to this fishery, review scientific information and develop management measures. The TTMAC provides a forum where higher level strategic issues relating to the fishery are discussed, the outcomes of which determine the recommendations that the TTMAC will make to the AFMA Commission. Similarly, for SBT issues, the Southern Bluefin Tuna Management Advisory Committee (SBTMAC) is the principal forum but they generally meet once per year. Fisheries Management Paper 1 – Management Advisory Committees outlines the function, roles and responsibilities of MACs (AFMA 2018a).

AFMA must also take into account advice from the relevant Resource Assessment Group (RAG). The main function of the RAG is to review scientific data and information and provide advice to the TTMAC and AFMA on the status of fish stocks, sub-stocks, species and the impact of fishing on the marine environment as well as developing the strategic research plan. The Tropical Tuna Resource Assessment Group (TTRAG) is the RAG for the ETBF. Membership consists of scientists, industry representatives, an AFMA member, an economist, a recreational member and an independent Chair. This ensures that the interests of a range of stakeholder groups are represented. Fisheries Administration Paper 12 sets out the roles and responsibilities of RAGs and outlines their relationship with the AFMA Commission, AFMA Management and MACs (AFMA 2018b).

AFMA works closely with regional fisheries management organisations, such as the WCPFC and CCSBT, together with the relevant Scientific Committees, which provides a key consultative platform at an international level when managing migratory species such as tuna and billfish. Australian representatives also participate at the FFA and associated committee meetings.

Tuna Australia (TA) (the Industry Association) was formed in 2016 and has allowed industry to take a more coordinated approach to working with AFMA on a range of issues including bycatch and education to improve compliance with fishing permit conditions. AFMA consults with TA on the management of the fishery. In addition, TA plays a role in advocating for the Industry and provides educational workshops.

AFMA formally consults with key stakeholder groups and the broader community through public comment opportunities which are advertised on AFMA's website. For example, draft Fisheries Management Papers such as AFMA's Exploratory Fisheries Policy is open to all interested parties for comment. AFMA conducts pre-season briefings, port visits and holds an annual public form, all of which are attended by a range of representative groups.

Other interest groups for this fishery include recreational anglers and game fishers that also target tuna and marlin in the ETBF. Many game fishers tag and release their catch, especially marlins. The retention of blue marlin (*Makaira mazara*) and black marlin (*M. indica*) has been banned in commercial fisheries since 1998 and commercial catch limits have been introduced on longtail tuna (*T. tonggol*) in recognition of the importance of these species to recreational anglers.

Management objectives

There are explicit, clear and consistent long and short term management objectives across all tiers of the management system. Legislative objectives are linked to fishery specific operational objectives that are prescribed in strategies and policies.

The overall long-term legislative objectives of the FMA 1991 that must be pursued by AFMA are:

a) *implementing efficient and cost-effective fisheries management on behalf of the Commonwealth; and*
b) *ensuring that the exploitation of fisheries resources and the carrying on of any related activities are conducted in a manner consistent with the principles of ecologically sustainable development (which include the exercise of the precautionary principle), in particular the need to have regard to the impact of fishing activities on non-target species and the long-term sustainability of the marine environment; and*
c) *maximising the net economic returns to the Australian community from the management of Australian fisheries; and*
d) *ensuring accountability to the fishing industry and to the Australian community in AFMA's management of the fisheries resources; and*
e) *achieving government targets in relation to the recovery of the costs of AFMA.*

In addition, AFMA and Joint Authorities are to have regard to the objectives of:

a) *ensuring, through proper conservation and management measures, that the living resources of the AFZ are not endangered by over-exploitation; and*
b) *achieving the optimum utilisation of the living resources of the AFZ; and*
c) *ensuring that conservation and management measures in the AFZ and the high seas implement Australia's obligations under international agreements that deal with fish stocks; and*
d) *to the extent that Australia has obligations:*
    (i) under international law; or
    (ii) under the Compliance Agreement or any other international agreement; in relation to fishing activities by Australian-flagged boats on the high seas that are additional to the obligations referred to in (c)- ensuring that Australia implements those first mentioned obligations; and
e) *ensuring that the interests of commercial, recreational and Indigenous fishers are taken into account;*

but must ensure, as far as practicable, that measures adopted in pursuit of those objectives must not be inconsistent with the preservation, conservation and protection of all species of whales.

These long-term objectives align with the specific objectives of the EPBC Act 1999, which under Parts 10, 13 and 13A require all Commonwealth fisheries to undertake assessment against the Guidelines for the Ecologically Sustainable Management of Fisheries (Guidelines).

The objective of the Commonwealth Harvest Strategy Policy (CHSP) is the ecologically sustainable and profitable use of Australia's Commonwealth commercial fisheries resources (where ecological sustainability takes priority)—through implementation of harvest strategies (DAWR 2018a). The objective of the Commonwealth Fisheries Bycatch Policy is to minimise fishing-related impacts on general bycatch species in a manner consistent with the principles of ecologically sustainable development and with regard to the structure, productivity, function and biological diversity of the ecosystem (DAWR 2018b).

At the regional level, long-term objectives are explicit within the WCPFC Convention. For example, Article 2 specifies that the Commission has the objective to "ensure through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the WCPO in accordance with the 1982 Convention and Agreement (UNCLOS and FSA respectively)".

7.3.3 Fishery Specific Management

The overarching fishery-specific management framework is outlined in the *ETBF Management Plan 2010*, a legislative instrument established under section 17 of the FMA 1991. The objectives in the Management Plan (MP) reiterate those of the FMA 1991 described above. Strategies that operationalise the ETBF MP have been consolidated into the ETBF Fisheries Management Strategy (FMS) which replaces the harvest strategy, ecological risk management strategy, bycatch action plan, research plan and data plan. An overview of the management arrangements, including conditions on the SFRs, can be found in the ETBF Management arrangements Booklet 2019 (AFMA 2019).

In addition to the CMMs mandated by the WCPFC listed above, the following management measures are currently in place for the ETBF:

- Limited entry fishery
- Statutory Fishing Rights (SFR Quota and Boat) can be permanently transferred or leased to another person or company
- Operators must hold a fishing permit which prescribes the area in which to fish, permitted method (Boat SFR) and if fishing for quota species, relevant quota holdings for that species (Quota SFR)
- Total Allowable Catch (TAC) for each quota species and certain non-quota species
- Gear restrictions – longline or minorline
- Implementation of a Seabird Management Plan
- Mandatory turtle mitigation measures
- Vessel Management Plan
- Prohibited species
- Spatial closures
- Navigation regulations that require boat to maintain a speed over 5 knots when navigating in a closure
- Nominated boat must be fitted with a Vessel Monitoring System
- Electronic monitoring
- Incidental catch limits
- Fish Receiver permits are required, and permit holders must complete the catch and disposal record
- eLogbooks, catch and disposal forms and transit forms must be completed by operators or nominated authorized agent and submitted to AFMA
- Must have an AFMA observer on board if directed by AFMA
- Bycatch handling

Southern Bluefin Tuna (SBT) is also harvested by vessels operating in the ETBF but all catches of SBT are managed under the *SBT Fishery Management Plan 1995*. To take SBT operators must hold SFRs granted under the SBT Management Plan and are subject to additional management measures such as the Catch Documentation Scheme (CDS) where the fish must be tagged and CDS forms used. In addition, a single SBT Zone is defined by AFMA to allow targeted SBT catch.

Decision-making process

The Australian Government delegates AFMA to implement management decisions in respect to all Commonwealth Fisheries. Decisions on the implementation of the policy are taken by the AFMA Commission, following advice from several forums depending on the fishery.

There are established decision making processes in the ETBF for setting TACCs for the key commercial species. The domestic and regional fishery/stock indicators for the three tropical tunas and two billfish species are estimated each year and provided in an overall advice paper from TTRAG to TTMAC and to the AFMA Commission. These indicators include:

- Stock Region
- Stock Status
- WCPFC Scientific Committee Advice
- Present WCPFC Management Arrangements
- Catch: WCPO and ETBF
- CPUE: WCPO and ETBF
- Mean Catch Weight: WCPO and ETBF

The Commission considers this advice from TTRAG, as well as advice from TTMAC, Tuna Australia (the industry association) and AFMA management, along with consideration of Australia's negotiating position at the WCPFC, in coming to a final decision on the TACC for each of these three stocks for the following season. In 2018, the AFMA Commission determined that this approach will also be applied temporarily to Striped Marlin and Broadbill Swordfish, in the period while a revised harvest strategy for these species is developed. A Chairman's summary following the AFMA Commission meetings is published on AFMA's website to ensure that the decision-making process is transparent. The AFMA Commission generally meets four or five times per year.

The WCPFC takes input and advice from a number of subsidiary bodies (e.g. Scientific Committee) and FFA members before making decisions, including the adoption of conservation and management measures (CMMs). Most recently, Australia put in a submission on swordfish to the Commission requesting a stronger CMM for this species be implemented. The submission was fully supported by the FFA and Australia was commended for its proactive approach to this issue. The Commission also seeks input from recognised international law experts to ensure that decision-making is informed in relation to compliance with international law and protocols.

Monitoring, Control and Surveillance

AFMA has a responsibility to enforce the provisions of the FMA through the detection of illegal activities within the AFZ. AFMA's monitoring, control and surveillance (MCS) program is designed to maintain the integrity of fisheries management arrangements and protect Australia's fishing resources. AFMA's program uses a risk-based approach that enables AFMA's resources to be targeted to the areas where they are most needed and where they will prove most effective (AFMA 2017a). Compliance Risk Management Teams are established to deal with each prioritized task. In addition to the risk model, AFMA maintains a 'general' presence at fishing ports and at sea to discourage noncompliance and provide advice or instructions to those wishing to comply.

AFMAs compliance program is comprehensive and includes:

- CRIMFISH hotline to report illegal or suspicious fishing

- Intelligence Unit
- Fisheries Officers (surveillance activities, inspections and education)
- Vessel Monitoring System
- Monitoring of Logbooks, Catch Disposal and Fish Receiver Records
- AFMA Fishery Observers as requested by AFMA
- 100% electronic monitoring in the ETBF
- Electronic logbook reporting.

The ETBF is subject to a biennial National Compliance Risk Assessment (2019-21). The compliance risk assessment process identifies modes of offending, compliance counter measures and risks and relies on a weight-of-evidence approach, considering information available from key stakeholders, specialist units, trends and issues identified by inspectors and priorities set AFMA. As outlined in the National Compliance and Enforcement Program (AFMA 2018c), the prioritised risks that are the focus of the 2019-20 program are:

- Quota evasion
- Bycatch mishandling
- Failure to report interaction / retention of protected or prohibited species.

Fisheries Officers (FOs) are formally appointed pursuant to the FMA, which clearly sets out their powers to enforce fisheries legislation, enter and search premises, obtain information and inspect catches. FOs are highly trained; they must have a thorough knowledge of the legislation they are responsible for enforcing and follow a strict protocol for undertaking their duties in accordance with FMA and in recording information relating to the number and type of contacts, offences detected, and sanctions applied. Operational planning compliance staff utilise a number of formal monitoring and surveillance activities and control mechanisms in the ETBF. Fisheries legislation forms one component of the control system for commercial fishers and these are applied through the SFR conditions.

Various sanctions are available to FOs following the detection of an offence. Verbal or written warnings may be given by a fisheries officer where the impact caused by an offence is minimal and the breach of a legislative instrument or regulation is of a minor technical nature. Written cautions may be given by a fisheries officer where the impact caused by an offence is minor or a first occurrence. Cautions are used for more serious matters and only if the officer believes there to be evidence of an offence. The regulations provide for infringement notices to be issued for breaches of fisheries management rules. These infringement notices require payment of the fine within a specified timeframe.

Longer term action may be required to address ongoing non-compliance. Amendment to concession conditions can be used where there is a need to take additional action arising from a breach of the legislation or legislative instruments. Amendments represent an alternative to other enforcement action to achieve compliance with the FMA. In addition, pursuant to sections 38 and 39 of the FMA, fishing concessions may be suspended or cancelled under certain circumstances. Prosecutions may be initiated where there is evidence of breaches of the FMA (or other relevant Commonwealth Acts) on a case-by-case basis, where prosecution is the most appropriate response to achieve personal and/or public deterrence.

With the implementation of electronic monitoring in the ETBF, AFMA now has a very strong capacity to ensure accurate reporting. Even though electronic monitoring has mostly replaced AFMA Observers onboard, all operators are required to carry observers when requested by AFMA.

The Australian MCS program is inherently linked to the regional WCPFC MCS system for the wider WCPO. WCPFC MCS tools include: VMS, illegal, unreported and unregulated (IUU) vessel listing, port state controls, observers, logbooks, transhipment monitoring and a compliance monitoring scheme. AFMA contributes to the effectiveness of these MCS tools through, for example, providing inspection vessels to the WCPFC high seas boarding and inspection program under CMM 2006-08 and ensuring

that its vessels are compliant with the regional WCPFC VMS reporting requirements on the high seas under CMM 2011-02. The IUU vessel list is the main deterrent for non-compliance in use by the WCPFC and it seems to be effective, with no new vessels added to the list since 2010.

AFMA continues to participate in multilateral fisheries operations in the Pacific Ocean, both on the high seas and in Pacific nations EEZs. During these multilateral operations, including FFA-led operations, AFMA officers are embarked on patrol assets, in the Regional Fisheries Surveillance Centre providing technical advice and investigation support (see Table below). As of 31 December 2019, AFMA have assisted nine Pacific Island countries in developing national Standard Operating Procedures (SOPs) through a Department of Foreign Affairs and Trade (DFAT) funding agreement. AFMA supports the FFA Secretariat and the Pacific Community (SPC) with delivery of courses (Certificate IV in Fisheries Enforcement and Compliance, and Certificate IV in Coastal Fisheries and Aquaculture Compliance respectively). AFMA also supports delivery of courses through the Australian Maritime College in Launceston.

Other measures to combat IUU fishing in the Pacific include close cooperation with New Zealand, US and France; support for the Australian Defence-led Pacific Maritime Security Program; sharing technical expertise in relevant international fora and through capacity building; and working alongside partners to strengthen regional frameworks.

Pacific operations since 1 July 2019

Name of operation	Partners	Focus area	AFMA contribution	Comments
Operation Rai Balang	FFA members	FFA member EEZs	Officers embarked on PNG, Vanuatu and Federated States of Micronesia patrol vessel and Regional Fisheries Surveillance Centre (RFSC)	Six violations detected across the operation
Operation Tui Moana	FFA members	FFA member EEZs	Officers embarked onboard Tongan patrol vessel and RFSC	57 vessels boarded and five infringements detected
Operation Nasse	Quadrilateral partners (France, USA, NZ, Aus) and Interpol	WCPFC Convention area adjacent to the AUS, FR, NZ EEZs	Officers embarked on French and Australian assets. The Coordination Centre hosted in New Caledonia	25 vessels boarded. Outcomes in Information Paper to WCPFC https://www.wcpfc.int/node/44001
Operation Island Chief	FFA members	FFA Member EEZs	Officers embarked onboard Republic of the Marshall Islands and US (patrolling Samoan EEZ) patrol vessels	126 boarding's at sea and in port
Operation Kuru Kuru	FFA members	FFA Member EEZs	Officers embarked onboard a	131 boarding's at sea and in port, with four infringements detected

			French patrol asset and the Tuvalu and Palau patrol boats	
Operation Ika Moana	Cook Islands, Kiribati and Samoa	FFA Member EEZs	Officer embarked onboard Samoan patrol boat	38 boarding's at sea with one infringement found

Monitoring and evaluation of management performance

Internal and external review mechanisms exist through all levels of the management system. Recent reviews of core Acts and policy settings resulted in a revised national harvest strategy and national bycatch management policy and guidelines in 2018 (DAWR 2018a, DAWR 2018b) to ensure they meet world's best practice.

AFMA's Annual Report documents overall performance against the legislative objectives, statutory requirements and financial reporting, the effectiveness of internal controls and adequacy of systems, while AFMA and the MACs are required to periodically assess the effectiveness of the management measures taken to achieve the objectives of the Management Plan by reference to the performance criteria specified in the Plan. AFMA also reviews the National Compliance and Enforcement Program every year.

AFMA's ERA and ERM framework has been independently reviewed resulting in improved Guidelines (AFMA, 2017b) and its broader fisheries management planning, implementation and reporting processes recommended, among other things, the development of fishery-specific Fisheries Management Strategies (FMS). The ETBF FMS has been approved by the Commission and AFMA will report on performance of the FMS through the publication of an Annual Report. A formal comprehensive review and revision of the FMS will be undertaken every 5 years, in association with the 5-year ERA cycle.

External reviews also include assessment by the DoEE against protected species and export approval requirements under the EPBC Act, evaluation through the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) annual reports on the ecological and economic sustainability of fisheries managed by AFMA and a Productivity Commission review of commercial fisheries regulation in Australia.

7.3.4 Principle 3 Performance Indicator scores and rationales

PI 3.1.1 – Legal and/or customary framework

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it: - Is capable of delivering sustainability in the UoA(s); - Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and - Incorporates an appropriate dispute resolution framework		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system **and a framework for cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and **organised and effective cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and **binding procedures governing cooperation with other parties** which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

The Offshore Constitutional Settlement (OCS) provides for the demarcation of fisheries management responsibility between the States and Australian Commonwealth. The Commonwealth has responsibility to manage fisheries between 3 nautical miles and 200 nautical miles from the coastline. The settlement is not set out in one single document but is found in the legislation that implements it. These are binding arrangements requiring both State and Commonwealth to implement fisheries management arrangements in their respective jurisdictions.

The *Fisheries Administration Act 1991* establishes the Australian Fisheries Management Authority (AFMA) to manage Commonwealth fisheries and administer the *Fisheries Management Act 1991* (FMA). This national legislation sets out AFMA's function and responsibilities in relation to the pursuit of ecological sustainable development. National policies such as the Commonwealth Harvest Strategy Policy (CHSP) and the Commonwealth Policy on Fisheries Bycatch govern the actions of AFMA which ensure that the management outcomes are consistent with Principles 1 & 2.

Commonwealth managed fisheries are subject to assessment against the Guidelines for the Ecologically Sustainable Management of Fisheries under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). These guidelines take into account the sustainable harvest of target and bycatch species and the impact on the habitat and broader ecosystem.

Under international law, as set out in the UNCLOS and related instruments, relevant members of highly migratory species are required to cooperate to ensure effective conservation and management of the resources. Australia is a member of the Regional Fisheries Management Organisation (RFMO) WCPFC which jointly manages the ETBF. AFMA is required to ensure that management of the ETBF is consistent with the CMMs set by the WCPFC to ensure management outcomes are consistent. The FMA objectives ensure that AFMA will have regard to Australia's obligations under international agreements that deal with fish stocks and their implementation which is binding. The CHSP also states that "The government (including the Australian Fisheries Management Authority) must implement decisions taken by all relevant RFMOs and other international arrangements that Australia is a party to (except where Australia has made a permissible reservation about the decision)" and "Through these forums,

Australia will pursue the adoption of measures that are consistent with the CHSP and domestic management measures."

The national legal system and binding procedures governing cooperation with the WCPFC and other relevant authorities are in place and effective and meets SG100.

b	Resolution of disputes			
	Guide post	The management system incorporates or is subject by law to a **mechanism** for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes which is **considered to be effective** in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes that is appropriate to the context of the fishery and has been **tested and proven to be effective**.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

At the national level, sections 161 and 165 of the FMA provide appeal rights for decisions taken by AFMA through administrative means (internal AFMA review and appeal to the Administrative Appeals Tribunal) and judicial means through appeal to the Federal Court. AFMA's decision to apply the precautionary principle have been upheld in a number of legal challenges, following referral to the Administrative Appeals Tribunal (e.g. Weier and Loke 2007).

AFMA advises fishers in writing of their appeal rights and the processes involved as a matter of course when, for example, alterations are made to their fishing concession conditions. In addition to these processes, the consultation and advisory processes established by AFMA provide mechanisms for the discussion and resolution of different perspectives on fisheries management issues by stakeholders. The legal system includes transparent mechanisms for the resolution of disputes. These mechanisms have been tested and proven to be effective.

At the WCPFC level, the dispute settlement provisions of the UN Fish Stocks Agreement apply to disputes between WCPFC Members (see Article 31 of the Convention – Procedures for the settlement of disputes). The provisions relating to the settlement of disputes set out in Part VIII of the Agreement apply, to any dispute between members of the Commission, whether or not they are also Parties to the Agreement. SG100 is met.

c	Respect for rights			
	Guide post	The management system has a mechanism to **generally respect** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to **observe** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to **formally commit** to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

Following the passing of the Fisheries Legislation Amendment (Representation) Act 2017 in November 2017, AFMA is explicitly required to have regard to the interests of commercial, recreational and Indigenous fishing sectors in managing Australian fisheries. As a first step in implementing this new requirement, AFMA has reviewed its Management Advisory Committee and Resource Assessment Group policies in preparation for potentially increasing the number of recreational and Indigenous members on relevant bodies.

The Commonwealth *Native Title Act 1993* provides the means by which the Australian legal system recognises the traditional rights and interests of Aboriginal and Torres Strait Islander people. This legislation provides a mechanism for the making of binding decisions about native title rights to areas of land and water and thereby ensures access to fish resources for people who depend on fishing for their food. Access rights by customary fishers remain within the context of ecological sustainable development and are therefore consistent with Principles 1 and 2.

The WCPFC Convention recognizes the interests of small scale and artisanal fishers within its framework for sustainability and requires that the needs of Small Island Developing States, territories and possessions, and coastal communities dependent on stocks including those taken in the fishery be recognised in the allocation of catch or effort (Art 10 (3) and Resolution 2008-01). Article 30 of the Convention, Part VIII – Requirements of developing states explicitly states the formal commitment to people dependent on fishing for food "*…. 2. In giving effect to the duty to cooperate in the establishment of conservation and management measures for highly migratory fish stocks, the Commission shall take into account the special requirements of developing States Parties, in particular small island developing States, and of territories and possessions, in particular:*
(a) the vulnerability of developing States Parties, in particular small island developing States, which are dependent on the exploitation of marine living resources, including for meeting the nutritional requirements of their populations or parts thereof;
(b) the need to avoid adverse impacts on, and ensure access to fisheries by, subsistence, small-scale and artisanal fishers and fishworkers, as well as indigenous people in developing States Parties, particularly small island developing States Parties, and territories and possessions; …". Therefore, SG100 is met.

References

WCPFC https://www.wcpfc.int/implementation-article-30-convention

Weier, A., and Loke, P. (2007). Precaution and the Precautionary Principle: two Australian case studies, Productivity Commission Staff Working Paper, Melbourne.

Overall Performance Indicator score	100
Condition number (if relevant)	

PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2	**The management system has effective consultation processes that are open to interested and affected parties** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**		
Scoring Issue	SG 60	SG 80	SG 100

a	Roles and responsibilities			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for key areas** of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

The key Australian Government agencies involved in Commonwealth fisheries are the Department of Agriculture, Water and the Environment (DAWE, formerly the Department of Agriculture and the Department of Environment and Energy) and AFMA. The DAWE provides overarching policy direction and oversees implementation of the policies such as the HSP. This includes ensuring the long-term environmental sustainability and economic productivity of Commonwealth fisheries, ensuring harvest strategies are implemented in line with the FMA and meeting environmental requirements arising from legislation and policy. The AFMA Commission is responsible for TAC setting and other decisions while AFMA management is responsible for the day to day operations. The functions of AFMA are set out in section 7 of the *Fisheries Administration Act 1991*.

Roles and responsibilities and advice about operation and participation in Management Advisory Committees (MACs) and Resource Assessment Groups (RAGs) are provided in:

• Management Advisory Committee, Fisheries Management Paper. No 1 (AFMA, 2018a)
• Fisheries Administration Paper (FMP) No.7 - Information and Advice for Industry Members on AFMA Committees (AFMA, 1999); and
• Fisheries Administration Paper Series No. 12 Resource Assessment Groups - Roles, Responsibilities and Relationship with Management Advisory Committees (AFMA, 2018b).

The Tropical Tuna MAC is the relevant MAC for the ETBF and the Southern Bluefin Tuna MAC for the SBT component. The MAC provides a forum where higher level strategic issues relating to the fishery are discussed, the outcomes of which determine the recommendations that the MAC will make to the AFMA Commission.

AFMA must also take into account advice from the relevant Resource Assessment Group (RAG), which for this fishery, is the TTRAG. The main function of the RAG is to peer review scientific data and information and provide advice to AFMA on the status of fish stocks, sub-stocks, species and the impact of fishing on the marine environment.

Fishery specific roles and responsibilities of key stages, processes and tasks required to implement the ETBF FMS are outlined in the FMS (AFMA In Prep.).

The WCPFC, established under the WCPO Convention, is also responsible for the management of these highly migratory stocks, including the adoption of CMMs to ensure the long-term conservation and sustainable use of these stocks. The WCPFC Convention Articles 9-16 and 23-24 provide information on the functions, roles and responsibilities of member states and the committees formed under Commission control (e.g. Scientific Committee and Technical Compliance Committee). The Commission and its associated committees have clear operating procedures and terms of reference and the roles

and responsibilities of members and non-members are clearly defined in the Convention. Australia is an active member of the WCPFC and its committees and the level of collaboration and cooperation is evidence that the roles and responsibilities of AFMA and the DAWE in international fisheries management are well understood.

Tuna Australia is the industry Association that represents ETBF fishers. This Association is developing a suite of Code of Practices for Tuna Australia members on topics including wildlife interactions, employee relations and the management of gear in marine parks.

The organisations and individuals involved in the management processes are clearly identified and their functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction. Therefore, SG100 is met.

	Consultation processes			
b	Guide post	The management system includes consultation processes that **obtain relevant information** from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information and **explains how it is used or not used**.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

AFMA actively involves a wide range of stakeholders in the process of developing and implementing fisheries management arrangements. These stakeholders include scientists, commercial fishers and fishing associations, researchers, environment and conservation organisations and recreational fishers. This approach is supported by specific consultative processes which are embodied in AFMA's governing legislation.

The Tropical Tuna Management Advisory Committee (TTMAC) is the key management advisory body for the ETBF. The committee includes representatives from AFMA, industry, scientific agencies, the recreational/charter fishing sector, state government and an environmental consultant. Representatives from agencies such as the DAWE and ABARES have attended MAC meetings as observers. Two meetings are held each year to discuss issues relating to this fishery, review scientific information and develop possible management measures. All management arrangements, including the current Plan, have been developed in consultation with TTMAC, operators and other stakeholders. For SBT the SBTMAC is the principal forum where issues relating to SBT are discussed between stakeholders.

The Tropical Tuna Resource Assessment Group (TTRAG) provides research and scientific advice for the fishery. The group is composed of fishery scientists, fishing industry members, an economist, an AFMA representative and recreational representatives. The group provides advice to the AFMA, TTMAC and the AFMA Commission on the status of fish stocks, sub-stocks, species (target and non-target), the impact of fishing on the marine environment and the type of information needed for stock assessments. They also evaluate the impact over time of different harvest strategies, stock depletion and recovery rates, confidence levels for fishery assessments and risks to the success of fishery objectives. Compliance and economic factors affecting the fishery, together with other issues related to

the general performance, reporting requirements and operational issues of the fishery, are also evaluated and reported on by the group.

The minutes from every MAC and RAG meeting, as well as a Chairman summary after AFMA Commission meetings, clearly explains the decisions and outcomes of the meetings including what information was presented and how information was used.

AFMA invites public comment on policy documents and AFMA position papers regarding recommended TAC settings and other strategies which are placed on the website and open to all interested parties for comment. AFMA demonstrates how information from submissions is used or not used by publishing a summary of the submissions and explaining how the submissions were addressed (i.e. Small Pelagic Fishery dolphin strategy).

AFMA consults with Tuna Australia (who represent the majority of tuna quota holders) during the process of developing management arrangements and the Director/CEO of Tuna Australia is an invited participant to both TTMAC and TTRAG meetings.

The Commonwealth Harvest Strategy Policy was reviewed in 2017. The revised policy was subject to public consultation, as well as the then DoA holding consultation workshops with targeted stakeholders (scientists, industry, recreational fishers and environmental NGOs).

At the regional level, there are extensive formal and informal consultation processes at the WCPFC that regularly seek and accept information from members and cooperating non-members. The Commission is active in assisting and facilitating the regular and timely provision of fisheries data and information in order to be assessed by the Commission secretariat and scientific providers such as SPC. The Commission actively uses information from the fishery and its member states in order to inform fisheries management decisions and the formulation of CMMs. This is demonstrated through reports and outcomes of WCPFC meetings, which detail the decision making process and are readily accessible online.

The incorporation of local knowledge through Committee membership and public consultation opportunities, together with the publication of consultation outcomes and meeting minutes, the fishery meets SG 100 for this performance indicator.

	Participation			
c	Guide post		The consultation process **provides opportunity** for all interested and affected parties to be involved.	The consultation process provides **opportunity and encouragement** for all interested and affected parties to be involved, and **facilitates** their effective engagement.
	Met?		**Yes**	**Yes**
Rationale				

AFMA facilitates stakeholder engagement mainly through the membership composition of MACs and RAGs. When required, both Committees have invited participants and observers with specific knowledge or interests to meetings to ensure a wide range of information is incorporated into the management system.

AFMA conducts an Annual Public Forum and many port visits throughout the year which provides an opportunity for interested people to learn about the fishing industry and how it is managed. Some AFMA Commission meetings are conducted in regional areas which allows the Commissioners to visit

various industries and people. In addition, interested parties can subscribe to AFMA's fishery news and media releases through the website and join AFMA's social media platforms.

At the regional level, the WCPFC Secretariat facilitates effective engagement by stakeholders such as attendance at Commission and related meetings. The WCPFC has previously convened a workshop of stakeholders in the WCPO tuna fisheries specifically. Upcoming meetings are published on the website. The WCPFC has provided financial support to cooperating non-members to ensure attendance and meaningful involvement and interaction in the cooperative management of fisheries in the region. Additional opportunities are provided through the FFA.

WCPFC and AFMA use various methods to facilitate effective engagement with stakeholders and therefore SG100 is met.

References

AFMA (1999). Fisheries Administration Paper. Information and Advice for Industry Members on AFMA Committees. https://afma.govcms.gov.au/sites/g/files/net5531/f/uploads/2014/09/Fisheries-Administration-Paper-7-Information-and-Advice-for-Industry-Members-on-AFMA-Committees1.pdf

AFMA (2018a) Fisheries Management Paper No. 1. Management Advisory Committees. https://afma.govcms.gov.au/sites/g/files/net5531/f/revised_fmp1_to_reflect_legislative_changes_-_october_2018.pdf

AFMA (2018b). Fisheries Management Paper 12. Resource Assessment Groups. https://afma.govcms.gov.au/sites/g/files/net5531/f/fap12_to_reflect_legislative_changes_and_economic_advice_-_october_2018.pdf

AFMA (In prep) ETBF Fisheries Management Strategy.

Overall Performance Indicator score	100
Overall Performance Indicator score	**100**

PI 3.1.3 – Long term objectives

PI 3.1.3		**The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach**		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are **implicit** within management policy.	**Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are **explicit** within management policy.	**Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are **explicit** within **and required by** management policy.
	Met?	**Yes**	**Yes**	**Partial**

Rationale

The long-term objectives of the management system are specified in Section 3 of the FMA and in the EPBC Act, and further defined in the Commonwealth Fisheries Harvest Strategy Policy (DAWR 2018a) and the Commonwealth Bycatch Management Policy (DAWR 2018b). The legislative objectives and policy guidance are consistent with MSC's Principles and Criteria and explicitly require application of the precautionary principle. AFMA must pursue (or have regard to) the objectives in the legislation. The fishery is also subject to the Commonwealth EPBC Act which requires periodic assessment against the Guidelines for the Ecologically Sustainable Management of Fisheries (DoE 1992). These Guidelines are consistent with the MSC Principles and Criteria and encourage practical application of the ecosystem approach to fisheries management.

Long-term objectives are explicit within the WCPFC Convention. For example, Article 2 specifies that the Commission has the objective to "ensure through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the WCPO in accordance with the 1982 Convention and Agreement (UNCLOS and FSA respectively)". Article 5 of the Convention then provides principles and measures for achieving this conservation and management objective. More specifically Article 5(c) requires the Commission to apply the precautionary approach in decision-making and Article 6 outlines the means by which this will be given effect, including through the application of the guidelines set out in Annex II of the FSA. Article 10 of the Convention is consistent with MSC principles and objectives in specifying long term objectives of "maintaining or restoring populations…above levels at which their preproduction may become seriously threatened". Overall, clear explicit objectives incorporating the precautionary approach and ecosystem-based fishery management in the policy meet the MSC Principles and Criteria and therefore SG80 is met at the national and regional level. However, it is uncertain as to whether the precautionary approach is applied in practice to all stocks at the regional level. While there are many examples of its application (e.g. adjustments to CMMs following advice from the SC), there has been some stocks that have become overfished which suggests that management has not been sufficiently precautionary across all stocks. Therefore SG100 is partially met.

References

Fisheries Management Act of 1991. http://www.austlii.edu.au/au/legis/cth/consolact/fma1991193/

DoE (1992). National Strategy for Ecologically Sustainable Development. http://www.environment.gov.au/about-us/esd/publications/national-esdstrategy

Environment Protection and Biodiversity Conservation Act 1999. http://www.comlaw.gov.au/Details/C2011C00751

Department of Agriculture and Water Resources (2018a). Commonwealth Fisheries Harvest Strategy Policy. Framework for applying an evidence-based approach to setting harvest levels in Commonwealth fisheries. http://www.agriculture.gov.au/fisheries/domestic/harveststrategypolicy

Department of Agriculture and Water Resources (2018b). Commonwealth Fisheries Bycatch Policy: Framework for managing the risk of fishing-related impacts on bycatch species in Commonwealth fisheries. http://www.agriculture.gov.au/fisheries/environment/bycatch/review

Overall Performance Indicator score	90
Condition number (if relevant)	

PI 3.2.1 – Fishery-specific objectives

PI 3.2.1		The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	**Objectives**, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **implicit** within the fishery-specific management system.	**Short and long-term objectives**, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.	**Well defined and measurable short and long-term objectives**, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.
	Met?	**Yes**	**Yes**	**Partial**
Rationale				

The long-term objectives specified in the ETBF Management Plan that are consistent with achieving the outcomes expressed by MSC's Principle 1 and 2: *"…..*

a) to manage the fishery efficiently and cost-effectively for the Commonwealth;

b) to ensure that the exploitation of the resources of the fishery and the carrying on of any related activities are conducted in a manner consistent with the principles of ecologically sustainable development and the exercise of the precautionary principle and, in particular, the need to have regard to the impact of fishing activities on by-catch species and the long-term sustainability of the marine environment;……..and

f) to ensure, the conservation and management measures taken in relation to the fishery implement Australia's obligations under relevant international agreements."

The ETBF operational objectives are clearly defined in the FMS (AFMA In prep.). The principle ETBF operational objectives for commercial species are:

- To ensure TACCs do not exceed agreed WCPFC national limits/allocations (e.g. as specified by WCPFC CMMs)
- Implementation of any adopted WCPFC Harvest Strategy and associated catch limits, or, for species where these are not adopted;
- Implementation of a domestic harvest strategy that:
  - maintains (for at least 90 per cent of the time) ETBF commercial fish stocks above a biomass limit (B_{LIM}) where the risk to the stock (i.e. of recruitment impairment) is regarded as unacceptable
  - maintains ETBF key commercial fish stocks, on average, at the required target biomass (B_{TARG}) to produce the maximum economic yield (MEY) from the fishery
- Ensure fishing is conducted in a manner that does not lead to over-fishing. Where it is identified that overfishing of a stock is occurring, action will be taken immediately to cease overfishing
- Ensure management of commercial species takes account of the precautionary principle
- Minimise discarding of commercial species to the greatest extent possible

The principle ETBF operational objectives for general bycatch species are:

- Fishing in the ETBF does not reduce any general bycatch species populations to/below a level at which the risk of recruitment impairment is unacceptably high.
- Where such reductions have occurred, implement management arrangements to support those populations rebuilding to biomass levels above that level.

- ETBF management arrangements draw on best practice approaches to avoid or minimise all bycatch, and minimise the mortality of bycatch that cannot be avoided
- Ensure management of bycatch species takes account of the precautionary principle

The principle ETBF operational objectives for EPBC listed species are:

- To not adversely affect the conservation status of protected species by fishing in the ETBF
- To not adversely affect the survival or recovery of threatened species by fishing in the ETBF
- AFMA ensure ETBF operators take all reasonable steps to ensure that protected species (other than conservation dependent species) are not killed or injured as a result of fishing

The Seabird Threat Abatement Plan (TAP) objectives are to:

- further reduce the bycatch of seabirds in oceanic longline operations and
- maintain a bycatch rate of less than 0.05 birds per 1000 hooks set in all fishing areas (by five degree latitudinal bands) and all seasons (1 September – 30 April; 1 May – 31 August) (CoA 2018).

The long-term objectives at the regional level have been highlighted in PI 3.1.3. Short-term objectives for specific target, non-target and ETP species are outlined in various conservation and management measures (CMMs) and include default or interim reference points for target stocks. Objectives relating to MSC Principles 1 and 2 outcomes are set out in CMM 2018-01 (bigeye, yellowfin and skipjack), and CMMs relating to sharks (CMM 2010-07) seabirds (CMM 2018-03) and sea turtles (CMM 2008-03) as well as national action plans (which Australia has implemented). However, many of the CMMs are not specified in terms of measurable targets or outcomes, particularly in relation to MSC Principle 2 outcomes.

Short and long term objectives are explicit at the national and regional level. SG80 is met. However, while some of the above objectives are quite broad, others are operationally defined (quantifiable levels such as number of birds caught in the TAP and reference points defined in CMM 2018-01) in such a way that the performance against the objective can be measured. Further measurable objectives will be defined once the national harvest strategy redevelopment project and the WCPFC agreed work plan for the adoption of harvest strategies is completed. Measurable objectives are not available for non-target and ETP species at the regional level and therefore only a partial score for SG100 is warranted.

References

AFMA (in Prep). ETBF Fisheries Management Strategy

CoA (2018) http://www.antarctica.gov.au/__data/assets/pdf_file/0004/222844/Threat-Abatement-Plan-for-the-incidental-catch-or-bycatch-of-seabirds-during-longline-oceanic-fishing-operations-2018.pdf

WCPFC https://www.wcpfc.int/conservation-and-management-measures

Overall Performance Indicator score	90

PI 3.2.2 – Decision-making processes

PI 3.2.2	**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery**

Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	Guide post	There are **some** decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are **established** decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	**Yes**	**Yes**	
Rationale				

At the WCPFC level, there are established decision-making processes in the Convention, and these are operationalised in the processes of the Scientific Committee and Technical Compliance Committee as well as the Commission. The WCPFC takes input and advice from the Committees before making decisions, including the adoption of conservation and management measures (CMMs). The Commission also seeks input from recognised international law experts to ensure that decision-making is informed in relation to compliance with international law and protocols.

At the national level, the TTRAG provides scientific advice on management options to AFMA managers, to the TTMAC and to the Commission. MACs provide management advice to the Commission for use when making decisions about fisheries management. The TAC setting process is well established. Stock assessment reports that provide recommended biological catch amounts for each quota species are produced by the RAG. This advice for the upcoming fishing season is provided to the TTMAC and AFMA management. The TTMAC makes a recommendation on the TACs which are sent to the AFMA Commission for a final decision.

A harvest strategy is a formal decision-making process that sets out the management actions necessary to achieve defined biological and economic objectives in a given fishery. AFMA is in the process of finalising a harvest strategy based approach for the tuna species which will include a decision rule to key indicator data for the fishery (e.g. CPUE data) and is re-developing and updating the ETBF Harvest Strategy for Swordfish and Striped Marlin. The revised harvest strategy is expected to be adopted in 2020.

Given that there are established decision making processes at the national and regional level, SG80 is met.

b	Responsiveness of decision-making processes			
	Guide post	Decision-making processes respond to **serious issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to **serious and other important issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to **all issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	**Yes**	**Yes**	**No**
Rationale				

At the WCPFC level, the decision-making process responds to serious issues that are identified through stock assessments and other regional reports. For example, WCPFC introduced measures to mitigate the capture of ETP species such as sharks (CMM 2010-07), seabirds (CMM 2018-03) and sea turtles (CMM 2008-03) as well as to reduce fishing pressure on bigeye (CMM 2018-01). These examples of new and amended CMMs demonstrates that the WCPFC decisions respond to serious and other important issues in a transparent (e.g. reports, papers and minutes on the website), timely (i.e. at the annual Commission meetings) and adaptive (using the best available information from the Scientific Committee) manner. The extent to which WCPFC responds in a timely manner to all issues that arise is uncertain, however, the length of the Commission meetings have been extended which may further improve the responsiveness of the decision making at this level.

At the national level, the management system is responsive to new information. For example, a Management Strategy Evaluation (MSE) to test the ETBF harvest strategy indicated that the catches of tropical tuna species may be reduced even when the stock was above target biomass levels and that the harvest strategy is therefore ineffective. Based on the MSE analyses, it was decided that an indicator-based and whole of Government Position approach which combines consideration of local and WCPO stock status indicators with Australia's whole of Government position on national allocation to determine the TACCs for the three tropical tuna species will be used. In 2018, the AFMA Commission determined that this approach will also be applied temporarily to Striped Marlin and Broadbill Swordfish, in the period while a revised harvest strategy for these species is developed.

The ETBF Fisheries Management Strategy (AFMA in prep.) replaces the harvest strategy and now encompasses byproduct species in addition to key commercial species. The classification of each byproduct species into categories was determined based on expert opinion of the TTRAG and TTMAC and is consistent with the CHSP and Guidelines 2018, including the use of harvest monitoring rules to ensure a review of catches occurs and if they increase above a trigger level can be responded to.

Recent breaches in seabird trigger levels in a couple of zones resulted in significant changes to the seabird conditions within the Threat Abatement Plan (TAP) that were implemented through permit conditions effective from 1st January 2020. These changes were subject to considerable consultation. Identified vessels are placed on an in-season watch list and if they breach the trigger limit they are required to choose one of four additional mitigation options. Should additional interactions (albatross and shearwaters) occur, another mitigation measure must be implemented. This is another example of responsive and timely management from AFMA.

Issues raised during the TTRAG and TTMAC meetings are carefully documented and monitored through action items. The issues are transparent and addressed in a timely manner as evidenced by the minutes of these meetings on the AFMA website.

Adaptive management to serious and important issues via the decision makers is evident at the regional level and strongly evident at the national level where the majority of the catch is taken within Commonwealth waters that is subject to a responsive quota-based system. Therefore, SG 80 is met. Whether all issues are addressed in a timely manner is unclear and therefore SG100 is not met.

C	Use of precautionary approach			
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		**Yes**	
Rationale				

All WCPFC members (including Australia) are legally bound to apply the precautionary approach and relevant CMMs as parties to the WCPFC Convention. Article 5(c) of the Convention requires the Commission to apply the precautionary approach in decision-making and there are examples of the use of this approach, such as maintaining the CMM for bigeye catch despite the improved stock status and pressure from members to increase the catch.

AFMA's management decisions must be consistent with the objectives in the FMA including the application of the precautionary principle. Key principles of the TTMAC and the TTRAG include that the "advice must be evidence based and use the best available scientific information." Another principle is that "AFMA seeks, through its scientific processes and committees/groups, to obtain the best quality information and advice".

The methodology used to undertake ERAs in Commonwealth fisheries is described in detail in the AFMA ERM Guide 2017 and is consistent with the precautionary approach with residual risk remaining high unless there is clear and substantiated evidence to the contrary (AFMA 2017b). For example, the most recent ERA of the risk of the ETBF to ecological sustainability of general bycatch and EPBC listed bycatch populations was an assessment of local impacts assuming that bycatch stocks are confined to the EEZ area. This precautionary assumption was made in the absence of information on the stock structure of most bycatch species. Therefore, SG80 is met.

d	Accountability and transparency of management system and decision-making process			
	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	**Information on the fishery's performance and management action is available on request**, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

Annual reports to the WCPFC Scientific Committee and WCPFC Technical and Compliance Committee are prepared by DAWE with AFMA assistance and published on the WCPFC website, together with comprehensive outcomes of the WCPFC meetings.

Formal reporting to all interested stakeholders on the ETBF's performance and management actions is provided through publicly available mechanisms including AFMA's Annual Report, minutes of TTMAC and TTRAG, outcomes of AFMA Commission meetings, stock assessments, ecological risk management reports, ETP interaction reports, catch data (through "Catchwatch") and Annual status reports by ABARES (ABARES 2019). Associated with the FMS will be Annual FMS Performance Reports which will further enhance stakeholder understanding of AFMA's management system.
The performance of the compliance program is articulated in the annual National Compliance and Enforcement Program report published on the AFMA website.

The Wildlife Trade Operation (WTO) strategic assessment reports produced by the DAWE and AFMA's application every three years, details progress in implementing the WTO conditions and recommendations for the ETBF (DoEE 2019a). Details in this report include changes to management arrangements, performance of the fishery against objectives, performance indicators and measures, research results and monitoring programs.

All of the abovementioned reports are available on the relevant websites and provide a description on the fishery's performance and changes in management from emerging research, monitoring and evaluation activities. Therefore, SG100 is met.

	Approach to disputes			
e	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

At the WCPFC level, the dispute settlement provisions of the UN Fish Stocks Agreement apply to disputes between WCPFC Members (Article 31). The WCPFC (the Commission) has not been subject to any court challenges which may, in part, be due to the adoption of consensus based decision making.

Nationally, the consultative and participatory characteristics of the management system through the MAC and RAG process act to avoid legal disputes by engendering a strong understanding of management and a strong sense of stewardship by stakeholders. The transparent and inclusive nature of management decision making minimizes the likelihood of legal disputes. The assessment team is not aware of any legal disputes in this fishery.

One example of AFMA proactively avoiding disputes is the communication to fishers when the recreational and game fishing season begins. AFMA reminds operators of the ETBF Code of Practice for Responsible Fishing which requires operators to, where practical, avoid fishing in areas where fishing tournaments are in progress to minimise conflict and provide more fishing time for all users. AFMA publishes a list of game fishing tournaments on its website and mails ETBF fishers directly on an annual basis (AFMA 2016).

The management system is successful in avoiding legal disputes as no legal challenges have taken place in the ETBF or the stocks caught in the high seas and SG 100 is met.

References

ABARES (2019) http://www.agriculture.gov.au/abares/research-topics/fisheries/fishery-status-2019

AFMA Annual Report https://www.afma.gov.au/annual-report-2017-18

AFMA (2016) https://www.afma.gov.au/obligations-relation-recreational-fishing-events-2016

AFMA (2017b) https://www.afma.gov.au/sites/default/files/uploads/2017/08/Final-ERM-Guide_June-2017.pdf

DoEE (2019a) https://www.environment.gov.au/marine/fisheries/commonwealth/eastern-tuna-billfish/assessment-2019 .

Overall Performance Indicator score	95

PI 3.2.3 – Compliance and enforcement

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			
	Guide post	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?	**Yes**	**Yes**	**Yes**
Rationale				

At the regional level, WCPFC aims to ensure compliance through VMS, IUU vessel listing, port state controls, observers, logbooks, transhipment monitoring and the compliance monitoring scheme. The combination of monitoring, control and surveillance (MCS) at WCPFC creates a system that has demonstrated to be comprehensive and effective in the WCPO fisheries (e.g. no IUU vessels have been added to the list since 2010). AFMA contributes to the effectiveness of the regional MCS system through, for example, providing inspection vessels to the WCPFC high seas boarding and inspection program under CMM 2006-08 and providing technical and investigation support to the Regional Fisheries Surveillance Centre. Together with FFA members and other partners, AFMA has been involved in six comprehensive compliance operations across the Pacific since July 2019. These operations have resulted in more than 350 boarding's on vessels at sea and in port with 10 infringements detected and six violations. Information from Operation Nasse confirmed an increase in the presence and use of turtle and seabird mitigation devices demonstrating an increase in compliance with WCPFC CMM's (WPCFC TCC 2019).

AFMA's compliance program is risk based (AFMA 2017a) and includes the following management measures:

- CRIMFISH hotline to report illegal or suspicious fishing
- Intelligence Unit
- Fisheries Officers (surveillance activities, inspections and education through port visits)
- Vessel Monitoring System
- Monitoring of Logbooks, Catch Disposal and Fish Receiver Records
- Electronic monitoring
- AFMA Fishery Observers at the discretion of AFMA.

The National Compliance and Enforcement Program 2019-20 (AFMA 2018c) includes a National Compliance Communication and Education Strategy, a General Deterrence Program, a Maintenance Program and a Targeted Risk Program which identifies areas of compliance focus to ensure it is effective. These annual reports also report on previous performance against targets. The 17/18 and 18/19 compliance assessment demonstrate that AFMA's MCS remains comprehensive and effective (AFMA 2018c) with increased compliance levels in the reporting of ETP interactions in the past year. There is a comprehensive MSC system in place at both a regional and national level and it has shown to be effective and enforce relevant management measures, so SG 100 is considered met.

b	Sanctions			
	Guide post	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.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

A range of sanctions exist to deal with non-compliance at the regional level. For example, the IUU vessel listing process (CMM 2010-06) only has three vessels listed and provides an incentive for compliance. Sanctions, such as infringements, are applied to fishing entities, such as IUU vessels and vessels that are detected as being non-compliant with CMMs. WCPFC notifies Flag States of non-compliant vessels, which the Flag States should order to withdraw from the Commission Area. These sanctions appear to be applied consistently and provide effective deterrence.

The FMA provides for penalties and 'administrative' sanctions in the event that fishers do not comply with the management measures for the fishery. Financial penalties such as infringement notices through to prosecutions can be applied. Penalties such as cancellation or suspension of a fishing licence can also be imposed. Immediate suspension of a license if quota has not been reconciled within 28 days is one example of a sanction.

Administrative sanctions include warnings and cautions when breaches are of a minor nature. Other sanctions include amendments to fishing licence conditions, directions by fisheries officers (such as for a vessel to immediately return to port) and license suspension. Seizure of catch for breach of a gear condition is another example. Compliance data provided by AFMA's Intelligence Unit demonstrates that several cautions and warnings have been imposed in the ETBF in the last 4 years. The non-compliance rate reduced from 26% in 2016 to 8% in 2018 which demonstrates that the sanctions provide an effective deterrent.

Given the relatively low national non-compliance rate and the low number of vessels on the IUU list, sanctions are considered to be an effective deterrent and SG100 is met.

c	Compliance			
	Guide post	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?	**Yes**	**Yes**	**Yes**
Rationale				

Nationally, the Compliance Division measures compliance outcomes by estimating compliance and non-compliance rates. In the last 3 years (2016-2018), from 79 inspections, 12 offences were detected in the ETBF (AFMA unpublished data). According to AFMA's Senior Compliance Managers fishers are good, the main issue being failure to report interactions with ETPs or incorrect reporting of ETP species (T. Spencer. Pers. Comm. November 2019).

The collection of accurate and comprehensive fisheries data is important for the stock assessment and TAC setting process and this information is submitted in both logbook and catch and disposal records. Since 1 July 2015, electronic monitoring has been mandatory for all full time pelagic longline vessels in the ETBF. At least 10% of video footage of all hauls is reviewed to verify the accuracy of logbooks which must be completed for 100% of shots. Where logbooks indicate an ETP interaction, 100% of the footage is viewed to validate numbers and identification of the species and improve accuracy of the information. The low detection of offences provides a high degree of confidence that fishers comply with the management system. AFMA observers have not been placed on the ETBF fleet since the introduction of electronic monitoring.

At the regional level WCPFC aims to ensure compliance through VMS, IUU vessel listing, port state controls, observers, logbooks and transhipment monitoring. The current IUU vessel listing highlights the success of the regional MCS strategy in deterring non-compliance as only three fishing vessels remain on the 2019 vessel list and none have been added since 2010. A summary of the compliance operations in the Pacific since July 2019 indicated 10 infringements were issued and six other violations detected in over 350 vessel boarding's. This indicates a high degree of confidence that the fishers comply with the management system. Therefore SG 100 is met.

d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	
	Met?		**Yes**	
Rationale				

There is no evidence of systematic non-compliance at the WCPFC level or in the ETBF (Tod Spencer, AFMA, pers com November, 2019). SG80 has been met.

References

AFMA (2017a) National Compliance 2017-2019 Risk Assessment Methodology. https://www.afma.gov.au/sites/default/files/uploads/2017/05/National-Compliance-Risk-Assessment-Methodology-2017-19.pdf

AFMA (2018c) National Compliance and Enforcement Program 2019-20. https://afma.govcms.gov.au/sites/default/files/afma_-_national_compliance_and_enforcement_program_2019-20_fa-tagged-final.pdf

WCPFC TCC (2019) Information paper on a cooperative Monitoring, Control and Surveillance activity in the Western and Central Pacific Fisheries Commission Convention Area: Operation Nasse. https://www.wcpfc.int/node/44001

Overall Performance Indicator score	**100**

PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		**There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system**		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate **some** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **key** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **all** parts of the fishery-specific management system.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

At the regional level, the WCPFC initiated reviews through an expert panel as a result of another tuna fishery in the region being MSC certified. There is a regional report developed by the WCPFC Secretariat, which details compliance of members with the reporting provisions of the Commission. Internal review is also conducted by the WCPFC through assessing the implementation and performance of CMMs through reports of member countries to the Commission and stock assessments. This allows Commission meetings to provide an overall review of key processes and outcomes.

All fishing operations on full time boats are electronically monitored, with 10 per cent of all longline shots (minimum of one shot per boat, per month) reviewed and compared to the logbook reports. Regular feedback reports are provided back to Eastern Tuna and Billfish Fishery operators to inform them of their reporting performance. Analyses conducted by ABARES indicates an improvement in logbook reporting.

Further improvements to data collection and validation have been recently implemented. For example, where an ETP interaction is recorded on logbooks, 100% of the electronic monitoring footage is viewed to confirm the identification of the ETP and experts will be engaged where required. In the case of dead seabirds, the procedure has been modified to ensure that the front and back of the bird wings are held in view of the camera. Feather sample kits have also been placed on vessels to provide for DNA identification which is subsequently corrected in the database where relevant.

The performance of the fishery is subject to scrutiny by the TTMAC, TTRAG, AFMA and other government agencies and a range of stakeholders. Data on interactions with ETPs is regularly evaluated and responded to when required (e.g. increase in seabird interactions in the summer of 17-18). The harvest strategy based approach is evaluated each year as part of the TAC setting cycle. The ETBF Management Plan is regularly reviewed, and outlines obligations for assessing the effectiveness of performance measures and reporting. The performance criteria detailed in the management plan were all met in 2017-18.

AFMA reviews the National Compliance and Enforcement Program every year. The effectiveness of the compliance activities including port and at sea inspections, VMS and closed areas are evaluated against the objectives of the respective programs on an ongoing basis. These activities are subject to biennial risk assessments undertaken by AFMA and appropriate changes made where required.

ABARES provides an independent evaluation of the biological and economic status of Commonwealth fish stocks annually (ABARES 2019).

Together the above examples of evaluation covers science, management and compliance and therefore SG 100 is met.

b	Internal and/or external review			
	Guide post	The fishery-specific management system is subject to **occasional internal** review.	The fishery-specific management system is subject to **regular internal** and **occasional external** review.	The fishery-specific management system is subject to **regular internal and external** review.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				
Rationale				

Compliance by the Eastern Tuna and Billfish Fishery with Conservation and Management Measures of the Western and Central Pacific Fisheries Commission is reviewed on an annual basis under the Western and Central Pacific Fisheries Commission Compliance Monitoring Scheme. Sustainability of the target species is assessed every three years by the Western and Central Pacific Fisheries Commission scientific committee with contributions from Australian scientists from ABARES and CSIRO.

AFMA has reviewed its Management Advisory Committee and Resource Assessment Group policies in preparation for potentially increasing the number of recreational and Indigenous members on relevant bodies.

In 2017-18, the ETBF harvest strategy was reviewed (including MSE) and an ERA completed for the fishery. For swordfish and striped marlin, AFMA are developing a new harvest strategy. An integrated Fisheries Management Strategy that combines existing fishery strategies and action plans into a single strategy to operationalise the ETBF Management Plan has recently been drafted.

The ETBF and the SBTF is assessed against the EPBC Act every 3 years and both fisheries meet the requirements to be a Wildlife Trade Operation and export product. The ETBF was recently assessed in August 2019 (DoEE 2019a) and the SBTF in November 2019 (DoEE, 2019c). The Fisheries Research and Development Corporation's Status of key Australian fish stocks reports (SAFS reports) contains independent assessments every two years for a number of species stocks taken in this fishery. The second independent review of the EPBC Act commenced in October 2019 (DoEE 2019b). The fishery is subject to regular internal and external review and SG 100 is met.

References

ABARES (2019) http://agriculture.gov.au/abares/research-topics/fisheries/fishery-status/eastern-tuna-billfish-fishery

DoEE (2019a) https://www.environment.gov.au/marine/fisheries/commonwealth/eastern-tuna-billfish

DoEE (2019b) https://www.environment.gov.au/epbc/about/review

DoEE (2019c) http://www.environment.gov.au/marine/fisheries/commonwealth/southern-bluefin

Overall Performance Indicator score	100

7.4 References

Principle 1

Brouwer, S., Pilling, G., Williams, P., John Hampton, and, 2018. A compendium of fisheries indicators for tuna stocks. Scientific Committee, Fourteenth Regular Session, Busan, Republic of Korea, 8-16 August 2018. WCPFC-SC14-2018/ SA-WP-02. https://www.wcpfc.int/node/30987

Davies, N., Harley, S., Hampton, J., and McKechnie, S. (2014). Stock assessment of yellowfin tuna in the Western and Central Pacific Ocean. WCPFC-SC10-2014/SA-WP-04, Majuro, Republic of the Marshall Islands, 6–14 August 2014. https://www.wcpfc.int/node/18997

Farley, J., Eveson, P., Krusic-Golub, K., Clear, N., Sanchez, C., Roupsard, F., Satoh, K., Smith, N., Hampton, J., 2018b. Update on age and growth of bigeye tuna in the WCPO: WCPFC Project 81. CSIRO Oceans and Atmosphere; WCPFC-SC14-2018/ SA-WP-01. https://www.wcpfc.int/node/31012

Farley, J., Eveson, P., Krusic-Golub, K., Sanchez, K., Roupsard, C., McKechnie, F., Nicol, S., Leroy, S., Smith, B., Chang, N., 2017b. Project 35: Age, growth and maturity of bigeye tuna in the western and central Pacific Ocean. Scientific Committee, 13th regular session, Rarotonga, Cook Islands, 9-17 August 2017, WCPFC-SC13-2017/SA-WP-01. https://www.wcpfc.int/node/29514

Farley, J., Krusic-Golub, K., Clear, N., Eveson, P., Smith, N., 2018a. Progress on yellowfin tuna age and growth in the WCPO WCPFC: Project 82. WCPFC Scientific Committee, Fourteenth Regular Session, Busan, Republic of Korea, 8-16 August 2018. https://www.wcpfc.int/node/31097

Hampton, J., Williams, P., 2017. Annual estimates of purse seine catches by species based on alternative data sources. Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/ST-IP-03. https://www.wcpfc.int/node/29507

Hoyle, S., Nichol, S., 2008. Sensitivity of bigeye stock assessment to alternative biological and reproductive assumptions. Scientific Committee, 4th Regular Session, Port Moresby, Papua New Guinea, 11-22 August 2008. WCPFC-SC4-2008/ME-WP-01. https://www.wcpfc.int/node/1276

Ianelli, J., Maunder, M. N., and Punt, A. E. (2012). Independent review of the 2011 WCPO bigeye tuna assessment. WCPFC-SC8-2012/SA-WP-01, Busan, Republic of Korea, 7-15 August 2012. https://www.wcpfc.int/node/3131

McKechnie, S., Hampton, J., Abascal, F., Davies, N., Harley, S.J., 2015b. Sensitivity of WCPO stock assessment results to the inclusion of EPO dynamics within a Pacific-wide analysis. WCPFC-SC11-2015/SA-WP-03. https://www.wcpfc.int/node/21774

McKechnie, S., Pilling, G., Hampton, J., 2017b. Stock assessment of bigeye tuna in the western and central Pacific Ocean. WCPFC-SC13-2017/SA-WP-05, Rarotonga, Cook Islands, 9–17 August. https://www.wcpfc.int/node/29518

McKechnie, S., Tremblay-Boyer, L., Pilling, G., 2017a. Background analyses for the 2017 stock assessments of bigeye and yellowfin tuna in the western and central Pacific Ocean. WCPFC-SC13-2017/SA-IP-06. https://www.wcpfc.int/node/29530

Peatman, T., Smith, N., Park, T., Caillot, S., 2017. Better purse seine catch composition estimates: recent progress and future workplan for Project 60. Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/ST-WP-02. https://www.wcpfc.int/node/29497

Pilling et al. 2014. Evaluation of risks of exceeding limit reference points for south Pacific albacore, bigeye, yellowfin and skipjack tunas with implications for target reference points: a case study using south Pacific albacore. https://www.wcpfc.int/node/18513

Pilling, G., Brouwer, S., 2017. Report from the SPC pre-assessment workshop, Noumea, April 2017. Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/SA-IP-02. https://www.wcpfc.int/node/29374

PNA, 2017. FAD data to be provided by observers. Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/ST-WP-06. https://www.wcpfc.int/node/29501

Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/SA-IP-22. https://www.wcpfc.int/node/29745.

Scott, R., Pilling, G.M., McKechnie, S., 2017. Stochastic status quo projections for bigeye tuna. WCPFC Scientific Committee, 13th Regular Session, Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/SA-IP-22. https://www.wcpfc.int/node/29745.

Sieben et al. 2019. Stewardship Council (MSC) Final Report. MIFV RMI EEZ Longline Yellowfin and Bigeye Tuna Fishery. On behalf of Marshall Islands Fishing Venture (MIFV). Prepared by Control Union Pesca Ltd. https://fisheries.msc.org/en/fisheries/mifv-rmi-eez-longline-yellowfin-and-bigeye-tuna/@@assessments.

SPC-OFP 2014. Consideration of acceptable levels of risk of exceeding Limit Reference Points for the four main tuna stocks: uncertainty and implications for Target Reference Points and Harvest Control Rules. MOW3-WP/02. https://www.wcpfc.int/node/20056

Takeuchi Y, Pilling G and Hampton J. (2017). Stock assessment of swordfish (Xiphias gladius) in the southwest Pacific Ocean. WCPFC-SC13-2017/SA-WP-13. https://www.wcpfc.int/node/29526

Tremblay-Boyer L, J. Hampton, S. McKechnie and G. Pilling. (2018). Stock assessment of South Pacific albacore tuna. WCPFC-SC14-2018/ SA-WP-05. Rev. 2* (2 August 2018). https://www.wcpfc.int/node/31182

Tremblay-Boyer, L., McKechnie, S., Pilling, G., and Hampton, J. (2017). Stock assessment of yellowfin tuna in the Western and Central Pacific Ocean. WCPFC-SC13-2017/SA-WP-06, Rarotonga, Cook Islands, 9-17 August 2017. https://www.wcpfc.int/node/29519

Tropical Tuna Resource Assessment Group Meeting minutes. https://www.afma.gov.au/fisheries/committees/tropical-tuna-resource-assessment-group

Vincent, M., Pilling, G., Hampton, J., 2018. Incorporation of updated growth information within the 2017 WCPO bigeye stock assessment grid, and examination of the sensitivity of estimates to alternative model spatial structures. WCPFC Scientific Committee Fourteenth Regular Session, Busan, Korea, 8-16 August 2018; WCPFC-SC14-2018/ SA-WP-03. https://www.wcpfc.int/node/31047

WCPFC 2018a. Summary Report. Fourteenth Regular Session of the Scientific Committee. Busan, South Korea. 8–16 August 2018. https://www.wcpfc.int/node/32155.

WCPFC 2018a. Summary Report. Fourteenth Regular Session of the Scientific Committee. Busan, South Korea. 8–16 August 2018. https://www.wcpfc.int/node/32155.

WCPFC 2018a. Summary Report. Fourteenth Regular Session of the Scientific Committee. Busan, South Korea. 8–16 August 2018. https://www.wcpfc.int/node/32155.

WCPFC 2018a. Summary Report. Fourteenth Regular Session of the Scientific Committee. Busan, South Korea. 8–16 August 2018. https://www.wcpfc.int/node/32155.

WCPFC, 2017a. Thirteenth Regular Session of the Scientific Committee, Rarotonga, Cook Islands, 9-17 August, 2017. Western and Central Pacific Fisheries Commission. https://www.wcpfc.int/node/29904

WCPFC, 2017b. Fourteenth Regular Session of the Commission, Manila, Philippines, 3-7 December 2017: Draft Summary Report. Western and Central Pacific Fisheries Commission. https://www.wcpfc.int/node/30295

Principle 2

ABNJ. 2017. Southern hemisphere porbeagle shark (*Lamna nasus*) stock status assessment. WCPFC-SC13-2017/SA-WP-12 (rev. 2). Scientific Committee, 13th Regular Session. Rarotonga, Cook Islands. 9 – 17 August 2017. Western and Central Pacific Fisheries Commission.

ABNJ. 2018. Pacific-wide silky shark (*Carcharhinus falciformis*) stock status assessment. Addendum. WCPFC-SC14-2018/ SA-WP-08 (8 August 2018). Scientific Committee, 14th Regular Session. Busan, Republic of Korea. 8 – 16 August 2018. Western and Central Pacific Fisheries Commission.

ACAP, 2012a. Black-browed Albatross. ACAP, 22pp. Available at: https://acap.aq/en/acap-species/238-black-browed-albatross/file [Accessed: 8 November 2019]

ACAP, 2012b. Wandering Albatross. ACAP, 20pp. Available at: https://acap.aq/en/acap-species/304-wandering-albatross/file [Accessed: 8 November 2019]

AFMA. 2008. Ecological Risk Assessment: Residual Risk Assessment for Eastern Tuna and Billfish Fishery. July 2008. AFMA Management.

AFMA. 2012. Ecological Risk Management Report for the Eastern Tuna and Billfish Fishery - April 2012.

AFMA. 2016a. Southern Bluefin Tuna Fishery Management Plan 1995. Available at: https://www.legislation.gov.au/Details/F2016C00642 [Accessed 8 November 2019]

AFMA. 2016b. Bycatch handling: AFMA bycatch handling and treatment guide 2016/17. Australian Fisheries Management Authority, Canberra.

AFMA. 2017a. Fisheries Management Paper 14. AFMA's Ecological Risk Management. June 2017. Available at: https://www.afma.gov.au/sites/default/files/uploads/2017/09/Attachment-A-ERM-FMP.pdf [Accessed 8 November 2019]

AFMA. 2017b. Guide to AFMA's Ecological Risk Management. 119 p. Commonwealth of Australia, Canberra. Available at: https://www.afma.gov.au/sites/default/files/uploads/2017/08/Final-ERM-Guide_June-2017.pdf [Accessed 8 November 2019]

AFMA. 2019. Eastern Tuna and Billfish Fishery Management Arrangements Booklet 2019. Australian Fisheries Management Authority, Canberra.

AFMA. Undated. Shark and ray handling practices: A guide for commercial fishers in southern Australia. Commonwealth of Australia.

Arkhipkin, A.I., Rodhouse, P., Pierce, G.J., Sauer, W., Sakai, M., Allcock, L., Arguelles, J., Bower, J.R., Castillo, G., Ceriola, L. et al. 2015. World Squid Fisheries. Reviews in Fisheries Science and Aquaculture 23: 2, 92 – 252.

Australian Government. 2019. Annual Report to the Commission Part 1: Information on fisheries, research and statistics. WCPFC-SC15-AR/CCM-01. Scientific Committee, 15th Regular Session. Pohnpei, Federated States of Micronesia. 12 – 20 August 2019. Western and Central Pacific Fisheries Commission.

CCSBT. 2018. Report of the Twenty Third Meeting of the Scientific Committee. 8 September 2018. Commission for the Conservation of Southern Bluefin Tuna.

Clarke, S. (ABNJ) 2018. Pacific-wide silky shark (*Carcharhinus falciformis*) stock status assessment. WCPFC-SC14-2018/SA-WP-08. Scientific Committee, 14th Regular Session. Busan, Republic of Korea. 8 – 16 August 2018. Western and Central Pacific Fisheries Commission.

Commonwealth of Australia. 2014. Assessment of the Eastern Tuna and Billfish Fishery: August 2014. Department of the Environment.

Commonwealth of Australia. 2018. Threat Abatement Plan for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations (2018), Department of the Environment and Energy, Canberra.

CSIRO. 2018. Australian fisheries stocks under climate change. Fact sheet.

DAFF. 2012. National Plan of Action for the Conservation and Management of Sharks 2012 Shark-plan 2. Department of Agriculture, Fisheries and Forestry. Commonwealth of Australia.

Davies, N., Hoyle, S. and Hampton, J. 2012. Stock assessment of striped marlin (*Kajikia audax*) in the Southwest Pacific Ocean. Technical Report WCPFC-SC8-2012/SA-WP-05, Scientific Committee, 14th Regular Session. Busan, Republic of Korea, 7-15 August 2012. Western and Central Pacific Fisheries Commission.

Ducharme-Barth, N., Pilling, G. and Hampton, J. 2019. Stock assessment of SW Pacific striped marlin in the WCPO. WCPFC-SC15-2019/SA-WP-07. Scientific Committee, 15th Regular Session. Pohnpei,

Federated States of Micronesia. 12 – 20 August 2019. Western and Central Pacific Fisheries Commission.

Froese, R. and D. Pauly (Eds). 2019. FishBase. World Wide Web electronic publication. www.fishbase.org, version (08/2019).

Fulton, E.A., Hobday, A.J., Pethybridge, H., Blanchard, J., Bulman, C., Butler, I., Cheung, W., Gorton, B., Hutton, T., Lozano-Montes, H., Matear, R., Pecl, G., Villanueva, C. and Zhang, X. 2017. Decadal scale projection of changes in Australian fisheries stocks under climate change. Fisheries Research and Development Corporation. Available at: http://www.frdc.com.au/Archived-Reports/FRDC%20Projects/2016-139-DLD.PDF [Accessed 8 November 2019]

Gaughan, D.J. 2002. Disease-translocation across geographic boundaries must be recognized as a risk even in the absence of disease identification: the case with Australian *Sardinops.* Reviews in Fish Biology and Fisheries 11: 113 – 123.

IUCN. 2019. The IUCN Red List of Threatened Species. Version 2019-2. http://www.iucnredlist.org. [Accessed: 8 November 2019]

MPI. 2017. Fisheries Assessment Plenary: Arrow Squid. Ministry for Primary Industries, Wellington. Available at: https://fs.fish.govt.nz/Doc/23544/04_SQU_2017%20FINAL.pdf.ashx [Accessed 8 November 2019]

MSC. 2018. MSC Fisheries Standard. Version 2.01. 31 August 2018. Marine Stewardship Council, London.

Pacific Bluefin Working Group. 2018. Harvest strategy for Pacific bluefin tuna fisheries. Harvest Strategy 2017-02. Western and Central Pacific Fisheries Commission 14th Regular Session. Manila, Philippines. 3 – 7 December, 2017. Available at: https://www.wcpfc.int/node/31804 [Accessed 8 November 2019]

Patterson, H. and Hansen, S. 2016. Post-release survival in tuna and tuna-like species in longline fisheries: an update. CCSBT-ESC/1609/BGD 01. Working Paper prepared for the CCSBT Extended Scientific Committee for the 21st Meeting of the Scientific Committee 5–10 September, Kaohsiung, Taiwan.

Sporcic, M., Hobday, A., Bulman, C., Fuller, M. 2018. Ecological Risk Assessment for the Effects of Fishing: Eastern Tuna & Billfish Fishery: Longline Sub-fishery, data to 2015. Report for the Australian Fisheries Management Authority.

Sustainable Fisheries Partnership (SFP). 2018. Argentine shortfin squid SW Atlantic. FishSource profile. In: FishSource [online]. Available at: https://www.fishsource.org/fishery_page/3728 [Accessed 21 October 2019].

Sustainable Fisheries Partnership (SFP). 2018. South American pilchard Japanese Pacific. FishSource profile. In: FishSource [online]. Updated 8 May 2018. Available at: https://www.fishsource.org/stock_page/2317. [Accessed 21 October 2019].

Takeuchi, Y., Tremblay-Boyer, L. Pilling, G. and Hampton, J. 2016. Assessment of blue shark in the southwestern Pacific. WCPFC-SC12-2016/SA-WP-08 REV1. Western and Central Pacific Fisheries Commission 12th Regular Session. Bali, Indonesia. 3 – 11 August, 2016. Available at: https://www.wcpfc.int/doc/14/south-pacific-blue-shark [Accessed 8 November 2019]

Tremblay-Boyer, L., Carvalho, F., Neubauer, P. and Pilling, G. 2019. Stock assessment for oceanic whitetip shark in the Western and Central Pacific Ocean. WCPFC-SC15-2019/SA-WP-06. Scientific Committee, 15th Regular Session. Pohnpei, Federated States of Micronesia. 12 – 20 August 2019. Western and Central Pacific Fisheries Commission.

Ward, T. M. and Grammer, G. L. 2018. Commonwealth Small Pelagic Fishery: Fishery Assessment Report 2017. Report to the Australian Fisheries Management Authority. South Australian Research and

Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2010/000270-9. SARDI Research Report Series No. 982.

WCPFC. 2017. Best handling practices for the safe release of mantas and mobulids. WCPFC Summary Report Attachment P. WFPF Commission 14th Regular Session. Manila, Philippines.

WCPFC Secretariat, SPC-OFP, ABNJ and ISC. 2019. Progress on the WCPFC stock assessment and shark research plan (summary table). WCPFC-SC15-2019/EB-WP-02_rev1. Scientific Committee, 15th Regular Session. Pohnpei, Federated States of Micronesia. 12 – 20 August 2019. Western and Central Pacific Fisheries Commission.

WCPFC. 2018. Pacific blue marlin (*Makaira nigricans*): Stock status and trends plus management advice and implications. Available at: https://www.wcpfc.int/doc/11/pacific-blue-marlin [Accessed: 8 November 2019]

Young, J.W., Lansdell, M.J., Hobday, A.J., Dambacher, J.M., Griffiths, S.P., Cooper, S.P., Kloser, R.J., Nichols, P.D. and Revill, A.T. 2009. Determining ecological effects of longline fishing in the Eastern Tuna and Billfish Fishery. FRDC Final Report 2004/063.

Principle 3

ABARES (2019). Fishery status reports 2019. http://www.agriculture.gov.au/abares/research-topics/fisheries/fishery-status-2019

AFMA (1999) Fisheries Administration Paper (FMP) No.7 - Information and Advice for Industry Members on AFMA Committees. https://afma.govcms.gov.au/sites/g/files/net5531/f/uploads/2014/09/FisheriesAdministration-Paper-7-Information-and-Advice-for-Industry-Members-on-AFMACommittees1.pdf

AFMA (2016) https://www.afma.gov.au/obligations-relation-recreational-fishing-events-2016

AFMA (2017a) National Compliance 2017-2019 Risk Assessment Methodology. https://www.afma.gov.au/sites/default/files/uploads/2017/05/National-Compliance-Risk-Assessment-Methodology-2017-19.pdf

AFMA (2017b) Guide to AFMA's Ecological Risk Management. https://www.afma.gov.au/sites/default/files/uploads/2017/08/Final-ERM-Guide_June-2017.pdf

AFMA (2018a), Management Advisory Committee, 2018. https://afma.govcms.gov.au/sites/g/files/net5531/f/revised_fmp1_to_reflect_legislativ e_changes_-_october_2018.pdf

AFMA (2018b), Resource Assessment Groups. https://afma.govcms.gov.au/sites/g/files/net5531/f/fap12_to_reflect_legislative_chang es_and_economic_advice_-_october_2018.pdf

AFMA (2018c) National Compliance and Enforcement Program 2019-20. https://afma.govcms.gov.au/sites/default/files/afma_-_national_compliance_and_enforcement_program_2019-20_fa-tagged-final.pdf

AFMA (2019). ETBF Management Arrangements Booklet 2019. https://afma.govcms.gov.au/sites/default/files/2019_etbf_management_arrangements_booklet_-revision_0.pdf

AFMA (In prep) ETBF Fisheries Management Strategy.

Borthwick, D (2012). Review of Commonwealth Fisheries: Policy, Legislation and Management, DAFF, http://www.agriculture.gov.au/SiteCollectionDocuments/fisheries/fisheriesreview/commonwealth-fisheries-management-review-report.pdf

CoA (2018) http://www.antarctica.gov.au/__data/assets/pdf_file/0004/222844/Threat-Abatement-Plan-for-the-incidental-catch-or-bycatch-of-seabirds-during-longline-oceanic-fishing-operations-2018.pdf

DAWR (2018a). Commonwealth Fisheries Harvest Strategy Policy. Framework for applying an evidence-based approach to setting harvest levels in Commonwealth fisheries. http://www.agriculture.gov.au/fisheries/domestic/harveststrategypolicy

DAWR (2018b). Commonwealth Fisheries Bycatch Policy: Framework for managing the risk of fishing-related impacts on bycatch species in Commonwealth fisheries. http://www.agriculture.gov.au/fisheries/environment/bycatch/review

DoE (1992). National Strategy for Ecologically Sustainable Development. http://www.environment.gov.au/about-us/esd/publications/national-esdstrategy

DoEE (2007). Guidelines for the Ecologically Sustainable Management of Fisheries. https://www.environment.gov.au/system/files/resources/97ff9461-5ccf-49cb-9368-8bde5f243c0b/files/guidelines.pdf

DoEE (2019a) Assessment report for the ETBF https://www.environment.gov.au/marine/fisheries/commonwealth/eastern-tuna-billfish/assessment-2019
DoEE (2019b) https://www.environment.gov.au/epbc/about/review

DoEE (2019c) http://www.environment.gov.au/marine/fisheries/commonwealth/southern-bluefin

WCPFC TCC (2019) Information paper on a cooperative Monitoring, Control and Surveillance activity in the Western and Central Pacific Fisheries Commission Convention Area: Operation Nasse. https://www.wcpfc.int/node/44001

WCPFC https://www.wcpfc.int/implementation-article-30-convention

WCPFC https://www.wcpfc.int/conservation-andmanagement-measures

Weier, A., and Loke, P. (2007). Precaution and the Precautionary Principle: two Australian case studies, Productivity Commission Staff Working Paper, Melbourne.

8 Appendices

8.1 Assessment information

8.1.1 Previous assessments

Walker Seafoods Australian albacore, yellowfin tuna and swordfish fishery was first certified in August 2015 with a subset of three Units of certification and operators. In total ten conditions were placed on the fishery nine at full assessment and one at the second surveillance audit.

Table 27 – Summary of previous assessment conditions

Condition	PI(s)	Year closed	Justification
1. The management system should formally adopt a target reference point for the South Pacific albacore stock, which is consistent with maintaining the stock at BMSY or some other measure with similar	1.1.2 (Albacore)	2019	Harmonised as part of the Mega variance and carried into re-assessment and no new condition is required.

intent or outcome. This target reference point should be used for management purposes.			
2.The fishery management system should put in place a regional harvest strategy, incorporating limit and target reference points (management objectives), a harvest control rule and management actions, such that the strategy is responsive to the status of the stock and the elements of the strategy work together to maintain the stock at or around the target level. The key missing elements of the harvest strategy at present are 1. a target reference point formally adopted by the regional management system, and 2. a well-defined harvest control rule with associated management actions. These issues are also addressed specifically in conditions 1 and 3.	1.2.1 (Albacore)	NA	Harmonised as part of the Mega variance and carried into re-assessment.
3.A well-defined regional-level harvest control rule should be put in place, with associated management actions (in the form of a WCPFC CMM or another form as appropriate) which together act effectively to reduce exploitation rates as the limit reference point is approached. The selection of the harvest control rule should take into account the main uncertainties regarding the status of the stock or the impact of the fishery (or other uncertainties if considered important).	1.2.2 (Albacore)	NA	Harmonised as part of the Mega variance and carried into re-assessment.
4. The fishery management system should put in place a regional harvest strategy, incorporating limit and target reference points (management objectives), a harvest control rule and management actions, such that the strategy is responsive to the status of the stock and the elements of the strategy work together to maintain the stock at or around the target level. The key missing element of the harvest strategy at present is a well-defined harvest control rule with associated management actions. This issue is also addressed specifically in condition 5.	1.2.1 (Yellowfin)	NA	Harmonised as part of the Mega variance and carried into re-assessment.
5. A well-defined regional-level harvest control rule should be put in place, with associated management actions (in the form of a WCPFC CMM	1.2.2 (Yellowfin)	NA	Harmonised as part of the Mega variance and carried into re-assessment.

or another form as appropriate) which together act effectively to reduce exploitation rates as the limit reference point is approached. The selection of the harvest control rule should take into account the main uncertainties regarding the status of the stock or the impact of the fishery (or other uncertainties if considered important).			
6. A limit reference point needs to be defined for the total stock area (WCPFC). This is to ensure that the stock does not fall below a level at which there is an appreciable risk to impairing reproductive capacity.	1.1.2 (swordfish)	N.A.	Variance approved to reconsidered in re-assessment.
7. A well-defined regional-level harvest control rule should be put in place; with associated management actions (in the form of a WCPFC CMM or another form as appropriate) which together act effectively to reduce exploitation rates as the limit reference point is approached. The selection of the harvest control rule should take into account the main uncertainties regarding the status of the stock or the impact of the fishery (or other uncertainties if considered important).	1.2.2 (swordfish)	N.A.	Variance approved to reconsidered re-assessment
8.**Turtles:** Continue to collect data, which allows turtle interactions per 1000 hooks to be estimated. • If data show that interactions have reduced to below the trigger level, no further action is required. • If data show that there remains a significant risk of interactions above the trigger level, further management measures should be implemented, either by Walker Seafoods Australia or by the ETBF as a whole. **Shortfin mako:** The fishery may show that it is not having an unacceptable impact on this species by various means: i) further reducing the mortality of this species from the fishery such that impacts are highly unlikely; and/or ii) providing an estimate of the total population size of shortfin mako against which the existing catch rate can be compared and shown to be acceptable; and/or iii) providing evidence on trends in shortfin mako	2.3.1	2019	The ecological risk assessment (ERA) have been finalised and all species including protected species like turtles and mako sharks assessed at high risk during the level 2 assessment were reduced to low risk following the PSA and residual risk assessment (Sporcic et al. 2019). Based on the revised risk score from the most recent ERA which is based on the information about the whole ETBF and data up to 2015, it can be concluded that the direct effects of this fishery (WSA) are highly unlikely to create unacceptable impacts to ETP species like turtles and mako sharks.

population in the area of the fishery, to show that there is no evidence of any reduction in the population in the area associated with the fishery; and/or iv) any other appropriate method.			
9. Collect and analyse data to provide an estimate of the total population size of shortfin mako against which the existing catch rate can be compared, and/or provide evidence on trends in shortfin mako population in the area of the fishery, in relation to the activity of the fishery.	2.3.3	2019	The ecological risk assessment (ERA) have been finalised and all species including protected species like shortfin mako sharks assessed at high risk during the level 2 assessment were reduced to low risk following the PSA and residual risk assessment (Sporcic et al. 2019).
10. At the Commission level, decision-making processes should respond to important issues, and specifically to the declining catch rates of South Pacific albacore, in a transparent, timely and adaptive manner by the end of Year 4. It should also take account of wider implications of decisions.	3.2.2	2019	At the Fifteenth Regular Session of the WCPFC December 2018, an interim target reference point (TRP) for albacore was determined which demonstrates that the WCPFC's decision making processes are responsive (WCPFC 2019). In addition, the development of the regional harvest strategy for albacore is progressing in line with the 2017 workplan and HCRs should be adopted in 2022.

8.1.2 Small-scale fisheries

Not a small-scale fishery.

Table 28 – Small-scale fisheries

Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
All UoAs	0%	0%

8.2 Evaluation processes and techniques

8.2.1 Site visits

The site visit was held at the Landmark Resort, Mooloolaba Beach, Queensland, Australia
On the 11th and 12th February 2020. The audit plan was provided was provided to the client, management agencies and scientists before the meeting (Table 27). The list of participants is provided in Table 28.

Table 27. Agenda

Activity	Items to Review/ Actions	People required/ attending	Time
Opening meeting with client	Introductions, Assessment process Q&A re. documentation provided ahead of the audit	Audit team, client representatives	9.00 – 9.30
Principle 1 Stock status and harvest strategy	P1 updates, review outcomes of latest assessment, data set, and status of the harvest strategy with focus on swordfish	client, team, scientists and managers	9:30 – 11:00
Principle 2 Ecosystem Impact	Principle 2 updates, review latest information on levels of catch of P2 species, Focus on non-target species (blue shark, striped marlin, sunfish), management strategies and measures to minimize catch. Management of lost gear Changes in the distribution of fishing area.	AFMA, client, team	11:15 – 12:30
Principle 3 Fisheries Management	P3 updates, Review of management arrangements	AFMA, client, team	14:00 – 15:00
	Information on compliance in the ETBF (including specific arrangements for SBT, finning prohibition)		
Team scoring	Focus on PIs that needed follow ups after ACDR		15:15 – 17:30

Wednesday 12th of February 2020, 9:00 - 15:00			
Activity	**Items to Review/Actions**	**People required/ attending**	**Approx. Time**
Stakeholder meetings	If requested by stakeholders. No meetings with the team have been requested to date.	Assessment team, Stakeholders (TBD)	9:00 – 10:00 no stakeholder meeting requested Team discussion instead

Closing meeting	Summary of findings and next steps	Assessment team & client	10:00 – 11:00
	Processing Walker Seafoods	Client, team	11:30 – 12:15
	Processing 4Seas	Client, team	13:00 – 15:00

Table 28. List of participants

Name	Role	Affiliation
David Ellis	CEO	Tuna Australia
Phil Ravanello	Client representative/ Program Manager	Tuna Australia
Don Bromhead	Fisheries Manager Tropical tuna Fisheries	AFMA
James Larcombe	ABARES Senior Fisheries Scientist, TTRAG and WCPFC committee member	ABARES Tropical Tuna Resource Assessment Group (TTRAG)
Matt Daniel	SBT Manager	AFMA
Josh Froggatt	Senior Compliance Officer	AFMA
Sabine Daume	Lead auditor	bio.inspecta Pty Ltd
Alexander Morison	P1 expert	Contractor bio.inspecta / Morison Aquatic Sciences
Johanna Pierre	P2 expert	Contractor bio.inspecta/ JPEC
Sascha Brand-Gardner	P3 expert	bio.inspecta Pty Ltd
Adrian Gutteridge	Observer	MSC

8.2.2 Stakeholder participation

Stakeholder opportunities were outlined in the Announcement of the fishery on the MSC website on 25 November 2019 and a separate email advising of the Announcement and inviting participation was sent to all stakeholders on the list. Stakeholders were offered private meeting with the assessment team, but none were requested.

8.2.3 Evaluation techniques

The stakeholder list was updated and expanded from the list provided by the previous CAB with assistance from the client representative. An allocated timeslot for meetings with stakeholders during the site visit was provided. In preparation for the site visit, the team requested personnel, with experience across all of the principles, make themselves available for questions from the assessment team.

The client submitted a comprehensive checklist with links to relevant documents. Information continued to be collected during and for minimal time after the site visit. Scoring was discussed by the assessment team during the site visit and the team aimed to agree on a score (a consensus approach). Scoring was formally completed during the final preparation of the client draft report.

8.1 Peer Review reports

Peer Reviewer A

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage).	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?		Yes, in general scoring appeared consistent with the standard, and was well supported by the provided evidence.	No response required.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]		The conditions raised appear appropriate. However, I have an observation regarding timeframe. My understanding is that the WCPFC harvest strategy workplan was amended in 2019 so that 'management procedures' (effectively estimation of stock status plus HCR) are due to be developed by 2022 for yellowfin and bigeye and adopted by 2022 for albacore. (See https://www.wcpfc.int/doc/placeholder-harvest-strategy-key-documents). Thus, I suspect that Conditions 1, 2, 5, and 6 are unlikely to be met by the second surveillance audit. Conditions 3 and 4 may have a better chance. While delays to adoption of robust harvest strategies are hardly something to condone, perhaps the timelines for the conditions should consider this information.	No response required. The timelines for the milestones were updated also reflecting the COVID 19 derogation.
Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?		N/A because this is not an enhanced fishery.	No response required.
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	The report was well written and clear. A lot of information is available for this fishery, particularly with the electronic monitoring and ecological risk assessments that have been conducted. Management policies at the national level appear robust, even though harvest strategies at the RFMO level are currently lacking. Although outside the control of this specific fishery, it would be great to see adoption of effective harvest strategies for these transboundary tuna and billfish stocks taking place sooner than later.	No response required.

PI	PI Infor-mation	PI Sco-ring	PI Con-dition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
1.1.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
1.1.2	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
1.2.1	Yes	Yes	Yes	Scoring agreed. The associated conditions for the target stocks appear appropriate.	No response required.	Accepted (no score change)
1.2.2	Yes	Yes	Yes	Scoring agreed. The associated conditions for the target stocks appear appropriate.	No response required.	Accepted (no score change)
1.2.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)

1.2.3	Yes	Yes	NA	The overall performance indicator score for swordfish on p. 110 is 60, which is not correct. The correct score is shown and used elsewhere.	This error has been rectified and the correct score of 80 now shown. The overall PI average score was correct.	Accepted (no score change)
1.2.4	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
1.2.4	Yes	Yes	NA	The text under SI(a) for albacore mentions that "we have a raised a recommendation associated with this concern" (p. 80), relating to inclusion of EPO removals in the stock assessment. Such a recommendation would be good to make, but I don't believe I saw it in the report (e.g. under section 5.2.4).	Although accounting for EPO removals would benefit the assessment a recommendation to this effect has not been made and this text has been deleted from the rationale.	Not accepted (no score change)
2.1.1	Yes	No (scoring implications unknown)	NA	It sounds as if southern bluefin tuna (SBT) could have been evaluated as either a primary or ETP species, based on text provided on p. 116: "Southern bluefin tuna could also be evaluated as an ETP species for this assessment...." My understanding of the MSC standard is that species recognized by national ETP legislation shall be assigned ETP (FCR v2.01 SA3.1.5.1). In this case, SBT is nationally listed as Conservation Dependent, which the assessment team pointed out, and it is also listed as endangered in New South Wales and as threatened in Victoria. I'm not sure how the fact that SBT is targeted means that SA 3.1.5.1 is not met; additional clarification would be helpful.	The reviewer is correct in noting that southern bluefin tuna could have been assessed as an ETP species given its Conservation Dependent status in the Australian Environment Protection and Biodiversity Conservation (EPBC) Act 1999. The assessment team decided to assess southern bluefin tuna as a primary species because the southern bluefin tuna fishery is declared to be an approved wildlife trade operation under the EPBC Act (subject to a set of conditions). This declaration remains in force until 11 November 2022. Under the EPBC Act, there is no adopted recovery plan or threat abatement plan for this species. However, approval as a wildlife trade operation requires adherence to the Southern Bluefin Tuna Fishery Management Plan 1995 in force under the Fisheries Management Act 1991.	Accepted (no score change)

					This additional clarification and a reference to the Declaration has been added to the Background section (pg. 118).	
2.1.1	No (no score change expected)	Yes	NA	If a main primary species is below PRI, SI(a) requires consideration of impacts from all MSC UoAs that categorize that species as main. While this was done for SBT (no other UoAs characterise it as main), it was unclear if the same was done for striped marlin. The rationale for marlin states that 'recent catch levels in the ETBF alone are unlikely to hinder recovery and rebuilding,' but confirmation as to whether there are other UoAs that may impact the stock seemed to be missing.	The rationale has been expanded. No other MSC UoAs consider this species main.	Accepted (no score change)
2.1.2	Yes	Yes	Yes	Scoring agreed, and the condition for Argentine squid appears appropriate.	No response required.	Accepted (no score change)
2.1.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.2.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)

2.2.2	No (no score change expected)	Yes	NA	My reading of 'if necessary' for SI(a) is that SGs 60 and 80 should be evaluated if the UoA impacts the relevant component at all, rather than depending on the degree of impact. If that's true, then a score should be assigned for ocean sunfish (OS) at the SG60 and 80 levels. I don't expect the change would affect scoring, since the PI 2.2.1 rationale states that a partial strategy exists for OS.	The interpretation of 'if necessary' was applied based on GSA3.5.1. However, the SI has been updated to carry through the existence of a partial strategy as mentioned in 2.2.1.	Not accepted (no score change)
2.2.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.3.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.3.2	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.3.3	Yes	Yes	NA	Scoring agreed. The collection of electronic monitoring data is definitely a strength.	No response required.	Accepted (no score change)
2.4.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)

2.4.2	Yes	Yes	NA	Scoring agreed. I appreciated seeing the information about gear loss and associated monitoring under SI(c).	No response required.	Accepted (no score change)
2.4.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.5.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.5.2	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.5.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.1.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)

3.1.2	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.1.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.2.1	Yes	Yes	NA	Scoring agreed. The WCPFC CMMs hyperlink on p. 189 should be updated.	Updated.	Accepted (no score change)
3.2.2	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.2.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.2.4	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)

Peer reviewer B

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage).	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	Scoring was consistent with MSC standard and clearly based on the evidence provided in the rationales and background sections for P1, P2 and P3, respectively. Some of the rationales in the PI scoring tables can be expanded, notably in PI 1.2.1 for each of the 4 UoAs. Scores are unlikely to be affected. Scoring in PI 2.2.2 can be better aligned with evidence on secondary species management strategies provided in the background information. No material change in scoring expected.	No response required. For Comments on specific PI rationales see responses under each PI.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]	Yes	All conditions are appropriately written to reach SG80 outcomes within the specified timeframes.	No response required.
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	A solid, professional PRDR with well-motivated scoring consistent with the MSC standard. Minor typo's throughout, but they largely do not distract from the quality of the report. Background information comprehensive and well-structured, with some omissions. A section describing the fishery (vessels, gears, history, fishing strategy) would be helpful. A schematic representation of the gear is provided in Figure 28 - at the end of the P2 background, which is very late. It would be helpful if it preceded Section 7.2 (Principle 1). Inconsistent naming of UoAs 1 and 2. Is UoA 1 Albacore (Table 2, p10), or is it Yellowfin (scoring Table on p 17)? Information on the harmonization of P1 scores required for RFMO highly migratory stocks was eventually found on p233 of 236, but should have been made clear in the background to P1 (Section 7.2.1), prior to using the sentence "This is the agreed harmonized score" in the P1 rationales.	No response required. As the figure relates to the gear type the team felt it was correctly placed in Principle 2 background. This has been consistently applied: UoA1 yellowfin, UoA2 Albacore following the order of the rational tables in the result section. The harmonisation requirements for P1 conditions for the tuna species are mentioned in each of the conditions. The mandated report structure puts the overview of harmonisation in Section 8.7 but to assist readers a cross-reference to this has been added at the start of P1 rationales.

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Res-ponse Code
1.1.1	Yes	No (no score change expected)	NA	Scoring agreed. In the rationale, the sentence "This is the agreed harmonized score" used repeatedly at the beginning of all Rationales in P1 (for tuna species) needs to be explained at least once. Which harmonization agreement does it refer to and by whom? See General comments.	The harmonisation requirements for P1 conditions for the tuna species are mentioned as a footnote to Table 9 and in each of the conditions. The mandated report structure puts the overview of harmonisation in Section 8.7 but to assist readers some additional text including a cross-reference to this section has also been added at the start of P1 rationales.	Accepted (no score change)
1.1.2	Yes	Yes	NA	Not scored. Agreed.	No response required.	Accepted (no score change)
1.2.1	Yes	No (no score change expected)	Yes	Rationale under (b) Harvest strategy evaluation needs to be expanded. As it stands, it provides evidence that stock status is above reference points. But it does not comment on the main harvest strategy objective - that elements need to work together.	The rationale provides three types of evidence that are explicitly identified as raising doubt both as to whether the HS would be responsive and also that the elements would work together when required to do so.	Not accepted (no score change)
1.2.2	Yes	Yes	Yes	Scoring agreed	No response required.	Accepted (no score change)
1.2.3	Yes	No (no score change expected)	NA	Rationale under (c) Comprehensiveness of information not detailed enough. What other removals are the assessors referring to?	Some additional text has been added to the rationale to clarify the other removals being referred to.	Accepted (no score change)
1.2.4	Yes	Yes	NA	Scoring agreed	No response required.	Accepted (no score change)

1.1.1	Yes	Yes	NA	Scoring agreed	No response required.	Accepted (no score change)
1.1.2	Yes	Yes	NA	Not scored. Agreed.	No response required.	Accepted (no score change)
1.2.1	Yes	No (no score change expected)	Yes	Rationale under (b) Harvest strategy evaluation needs to be expanded. As it stands, it provides evidence that stock status is above reference points. But it does not comment on the main harvest strategy objective - that elements need to work together.	The rationale provides evidence that is explicitly identified as raising doubt both as to whether the HS would be responsive and also that the elements would work together when required to do so.	Not accepted (no score change)
1.2.2	Yes	Yes	Yes	Scoring agreed	No response required.	Accepted (no score change)
1.2.3	Yes	No (no score change expected)	NA	Rationale under (c) Comprehensiveness of information not detailed enough. What other removals are the assessors referring to? Reference to north Pacific albacore in rationale for (b) . Should be south Pacific?	All fishery removals are considered in the assessment so the rationale has been amended to remove reference to 'other' removals. The reference to north Pacific albacore has been corrected to South Pacific.	Accepted (no score change)
1.2.4	Yes	Yes	NA	Scoring agreed	No response required.	Accepted (no score change)
1.1.1	Yes	Yes	NA	Scoring agreed	No response required.	Accepted (no score change)
1.1.2	Yes	Yes	NA	Not scored. Agreed.	No response required.	Accepted (no score change)
1.2.1	Yes	Yes	Yes	Scoring agreed	No response required.	Accepted (no score change)

1.2.2	Yes	Yes	Yes	Scoring agreed	No response required.	Accepted (no score change)
1.2.3	Yes	Yes	NA	Scoring agreed	No response required.	Accepted (no score change)
1.2.4	Yes	Yes	NA	Scoring agreed	No response required.	Accepted (no score change)
1.1.1	Yes	Yes	NA	Scoring agreed	No response required.	Accepted (no score change)
1.1.2	Yes	Yes	NA	Not scored. Agreed.	No response required.	Accepted (no score change)
1.2.1	Yes	No (scoring implications unknown)	Yes	As presented the rationale is difficult to follow without explicitly referencing the indicators used and how they translate into decisions to increase or decrease the TACC. In (b), does evidence really exist that the present HS is achieving its objectives?	Additional text has been added to the rationale for scoring issue a that lists the indicators used. How these translate into TACC decisions is assessed under PI 1.2.2 where it is noted that the TACC is not set based on any explicit HCR but on a generally understood one that considers trends in these indicators. For (b), the evidence given for achieving the sustainability objective is the current stock status - not overfished and not subject to overfishing.	Accepted (no score change)
1.2.2	Yes	Yes	Yes	Scoring agreed	No response required.	Accepted (no score change)
1.2.3	Yes	No (score increase expected)	NA	Typo on p 110. Overall Performance indicator score should be 80, not 60. It is correct on the summary scoresheet, though (7.1 on p17)	Error has been corrected thank-you.	Accepted (no score change)

1.2.4	Yes	Yes	NA	Scoring agreed	No response required.	Accepted (no score change)
2.1.1	Yes	No (scoring implications unknown)	NA	Striped marlin is below PRI and there is only a slight improvement in stock status in the latest assessment. Thus the present harvest strategy does not appear to be effective. A new strategy is under development - but not yet active. Unclear if SG80 is met.	Additional rationale has been added for striped marlin. The present strategy was developed in the context of the 2012 stock assessment (when overfishing was not considered to be occurring). A review of the harvest strategy is underway, which is expected to reflect the findings of the 2019 stock assessment. Beyond that, the scoring reflects the following points: - no other MSC UoAs identify the SW striped marlin as a main primary species - the catch in this fishery from 2013-2017 was, on average, 19% of the WCPFC catch (lower than the 30% guidance identified in GSA3.4.6 as the proportion of catch that is not normally influential in hindering recovery) - stock-wide, F is below FMSY (also referred to in GSA3.4.6).	Accepted (no score change)
2.1.2	Yes	Yes	Yes	Scoring agreed. Condition 9 refers to Argentine squid only.	No response required.	Accepted (no score change)
2.1.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.2.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)

2.2.2	Yes	No (scoring implications unknown)	NA	The conclusion that measures and a partial strategy are not necessary for Ocean Sunfish (secondary main species) refers. But species-specific management measures are indeed in place for Ocean Sunfish (see Table 18 on p123; but contradicted on p116). It should therefore be considered at all three SGs at PI 2.2.2 (a - c).	Table 18 has been updated to align with the text on page 116, and the scoring rationale. This was a versioning error. Thank you for highlighting.	Accepted (no score change)
2.2.2	Yes	No (scoring implications unknown)	NA	The conclusion that measures and a partial strategy are not necessary for secondary minor species refers. There are catch limits or prohibitions on retention in place for several minor species or species-groups (Table 18). Minor species should therefore be considered at all three SGs at PI 2.2.2 (a - c).	2.2.2(a) and 2.2.2(b) refer explicitly to main species, and minor species would be assumed to meet by default. SG100 specifically refers to both main and minor species, therefore minor species are considered.	Not accepted (no score change)
2.2.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.3.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.3.2	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.3.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.4.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.4.2	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)

2.4.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.5.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.5.2	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
2.5.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.1.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.1.2	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.1.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.2.1	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.2.2	Yes	No (score increase expected)	NA	PI score should be 90 based on avg. of SI scores?	PI scores are not based on averages; however, this PI has been rescored to 95 in accordance with clause 7.17.7.4 of FCP v2.1.	Accepted (score increased)

3.2.3	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)
3.2.4	Yes	Yes	NA	Scoring agreed.	No response required.	Accepted (no score change)

8.2 Stakeholder input

To be completed at Public Certification Report

Written stakeholder comments were received by ISSF during the ACDR comment period (see copy of the submission and team response below).

Stakeholder submission and CAB responses

Category	Contact details
Title	Ms.
First name*	Ana
Last name*	Justel
Organisation*	International Seafood Sustainability Foundation (ISSF)
Email*	ajustel@iss-foundation.org
Department	
Job title	
Description	The International Seafood Sustainability Foundation (ISSF) is a global partnership among the tuna industry, science and WWF, the global conservation organization. ISSF's mission is to undertake science-based initiatives for the long-term conservation and sustainable use of tuna stocks, reducing by-catch and promoting ecosystem health.
Fishery name*	Australian Eastern Tuna and Billfish Fishery (albacore tuna, yellowfin tuna, bigeye tuna and swordfish)
Certification body (CAB)*	q.inspecta GmbH
Assessment Stage*	Stakeholder input on the Announcement Comment Draft Report

Performance Indicator (PI) input

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response to stakeholder input	CAB response code
1.2.2 - Harvest control rules and tools **(YFT)**	The independent report by Medley et al. (2019) indicates that the fishery would not meet SG60 for SI 1.2.2.a and 1.2.2.c and that, as a result, the overall PI score would be less than 60 ("Fail").	The independent report by Medley et al. (2019) indicates that the fishery would not meet SG60 for SI 1.2.2.a and 1.2.2.c and that, as a result, the overall PI score would be less than 60 ("Fail"): **1.2.2.a**: "At SG60, MSC allows a harvest control rule to be 'available' rather than 'in place' if the requirements summarised below are met (for full list see SA2.5.2, 2.5.3): • Stock biomass has not previously been reduced below the MSY level, or has been maintained at that level for a recent period of time … and is not predicted to be reduced below BMSY within the next 5 years; • HCRs are effectively used in other stocks by the same management body or an agreement or framework is in place requiring the management body to adopt HCRs before the stock declines below BMSY. MSC's second requirement for an 'available' HCR is met for yellowfin by CMM 2014-06. In terms of the first, for WCPO yellowfin, stock biomass has not previously been reduced below the MSY level, according to the stock assessment. There are no short-term projections available at present based on the new assessment to evaluate likely stock trajectory over the next five years but as noted in 1.1.1 and 1.2.1, the probability of either SB or F being below the MSY level is quite small, and on that basis, it is not likely that the biomass will decline below the MSY level in the next five years. However, the biomass trajectory is consistently downwards throughout the time series, and there is no particular reason at present to suppose that it	Medley et al. (2019)	<60	This is a harmonized score and rationale which is based on full consideration of MSC requirements by a range of P1 experts. It has been agreed that the stock meets the requirements for 2.5.2a and 2.5.3b and that a pass at SG60 is appropriate. It is not necessary to meet 2.5.2b and 2.5.3a as well. We share the concerns about slippage with the harvest strategy workplan and this has in part prompted the new VR for all tuna fisheries. The timeframe is now set.	Not accepted (no score change)

		will stabilise above BMSY under the current management regime. However, the case of bigeye raises the question as to what actions WCPFC could be relied on to take, should the next stock assessment for yellowfin give a different perception of the stock status (as happened for bigeye in 2017). Despite bigeye being considered overfished from 2011-2017, the management actions put in place by WCPFC have shown no evidence so far of being able to reduce fishing mortality on bigeye, as shown by the most recent stock assessment. On this basis, there is no particular evidence that any 'available' HCR is able to reduce the exploitation rate as the PRI is approached. On this basis, SG60 is not met. For improvement in this scoring, some demonstrable progress is required towards a formal harvest strategy and HCR (as per CMM 2014-06) such that a more convincing argument can be made that effective action will be taken if required. There was no progress at WCPFC14 and it does not appear as if there was any at WCPFC15 either. The authors are aware that this scoring may not be consistent with the MSC certification of several fisheries targeting this stock. One reason for this difference is that this assessment is a pre-assessment, not a full assessment. A full assessment is based on a strict interpretation of the MSC requirements (scoring issues and guidance) at the time of scoring. A pre-assessment is more focused on risks to an MSC assessment failing and may be more useful to stakeholders to inform decisions about entering certification over a timeframe of a year or more, with the certification process taking a further year or so. A pre-assessment therefore needs to take into account what the situation with the stock is likely to be over this timeframe. We are concerned that although strictly the MSC requirements may be met at time of writing, there has been slow progress with the development of harvest strategies for WCPFC				

		stocks since the commitment was made (CMM 2014-06 was agreed) and strict timelines are not being observed. The workplan for the implementation of CMM 2014-06 has been systematically revised, with CPCs seemingly unwilling to apply the timetable (e.g. see WCPFC14 report). Based on this situation, MSC-certified fisheries with condition milestones for the achievement of a formal harvest strategy for this stock should, based on MSC procedures, be first scored at audit as 'behind target' and subsequently (the following year) have their certificates suspended if progress has not been made. The authors are unclear as to why fisheries on these stocks have been able to retain their certificates in the absence of any substantive progress up till now. Based on our understanding of the MSC standard, unless granted a special case (a variation request), these fisheries would not meet MSC certification requirements at this point." (…) 1**.2.2.c**: "Under SA2.5.5, in order to conclude that 'available' HCRs are 'effective' (SG60), MSC requires evidence of i) the use of effective HCRs in other stocks or fisheries under the same management body; or ii) a formal agreement or framework with trigger levels which will require the development of a well-defined HCR. It also requires consideration of current exploitation rates in relation to biological reference points and the agreed trigger level (guidance for SA2.5.6: 'evidence that current F is equal to or less than FMSY should usually be taken as evidence that the HCR is effective'). The authors are aware that this is not the same as the scoring applied in various MSC certifications for fisheries targeting this stock. The reasons for this are set out in the rationale for 1.2.2a above, and are primarily due to the different purpose of a pre-assessment and timing for meeting the MSC requirements. In our opinion, in order to meet MSC requirements				

		at this stage, some demonstrable progress is required towards an effective formal harvest strategy (as per CMM 2014-06) such that it is more clear that management tools are likely to be able to maintain stocks at agreed target levels. The tools by which CMM 2017-01 is implemented for yellowfin are as follows: • temporal / spatial limits on purse seine setting on FADs • restrictions on purse seine effort (days) There are no limits on longline fishing for yellowfin, although catch limits for bigeye may (may) limit effort for some CCMs. The catch time series in the 2017 stock assessment runs to 2015; the harvest strategy has only been in place since 2014, and is incremental, so it is hard to say what impact it has had up till now. Estimated juvenile F has stabilised and perhaps decreased, but the trajectory of adult F does not seem to have been altered. The trajectory of stock biomass is downwards throughout the time series. On this basis, there is no particular evidence that the various tools in place are effective in controlling fishing mortality, and no reason to suppose that the stock trajectory will not continue downwards. **On this basis, SG60 is not met**."				
1.2.2 - Harvest control rules and tools **(BET)**	The independent report by Medley et al. (2019) indicates that the fishery would not meet SG60 for SI 1.2.2.a and 1.2.2.c and that, as a result, the overall PI score would	The independent report by Medley et al. (2019) indicates that the fishery would not meet SG60 for SI 1.2.2.a and 1.2.2.c and that, as a result, the overall PI score would be less than 60 ("Fail"): **1.2.2.a**: "At SG60, MSC allows a harvest control rule to be 'available' rather than 'in place' if the requirements summarised below are met (for full list see SA2.5.2, 2.5.3): • Stock biomass has not previously been reduced below the MSY level, or has been maintained at that level for a recent period of time … and is not predicted to be reduced below BMSY within the next 5 years; • HCRs are effectively used in other stocks by the same management body or an agreement or framework is in place requiring the	Medley et al. (2019)	<60	This is a harmonized score and rationale which is based on full consideration of MSC requirements by a range of P1 experts. It has been agreed that the stock meets the requirements for 2.5.2a and 2.5.3b and that a pass at SG60 is appropriate. It is not necessary to meet 2.5.2b and 2.5.3a as well. We share the concerns about slippage with the	Not accepted (no score change)

	be less than 60 ("Fail").	management body to adopt HCRs before the stock declines below BMSY. For WCPO bigeye, the second of MSC's requirements to score a HCR as 'available' is met via CMM 2014-06. In terms of the first, the stock biomass has not previously been reduced below the MSY level, according to the 2017 and 2018 stock assessments. The updated 2018 stock assessment gives narrower confidence intervals for SB/SBMSY, suggesting that it is not likely that SB will decline below the MSY level in the short term. Projection results to 2045 show a high level of uncertainty with regard to whether management objectives (i.e. the LRP and the target in CMM 2017-01 and 2018-01) would be achieved. Based on long-term average recruitment, there is a high risk (18-32%) of breaching the LRP and ~zero probability of meeting the management target, while assuming higher recruitment (as per the more recent situation), both objectives are achieved with high probability. Overall, it is not likely that the biomass will decline below the MSY level in the next 5 years, so the requirements for a HCR to be 'available' at SG60 are met. The current harvest strategy (CMM 2017-01, 2018-01) does not have a well-defined HCR. It has a series of measures (restrictions on purse seine effort, FAD purse seine sets and longline catch limits) which are intended to restrain catches of bigeye such that the biomass is maintained at recent (2012-15) levels. Although the most recent stock assessment work (2017, updated 2018) puts the stock in the Kobe plot green zone, this is a function of a change in the growth model rather than the effect of management action, which has not had been able to reduce fishing mortality, either on adults or on juveniles, according to the 2017 stock assessment. On this basis, the HCR has not worked to address the perception of stock status, and there is no reason to suppose that it will work failing and may be more useful to stakeholders to inform decisions			harvest strategy workplan and this has in part prompted the new VR for all tuna fisheries. The timeframe is now set.	

		about entering certification over a timeframe of a year or more, with the certification process taking a further year or so. A pre-assessment therefore needs to take into account what the situation with the stock is likely to be over this timeframe. We are concerned that although strictly the MSC requirements may be met at time of writing, there has been slow progress with the development of harvest strategies for WCPFC stocks since the commitment was made (CMM 2014-06 was agreed) and strict timelines are not being observed. The workplan for the implementation of CMM 2014-06 has been systematically revised, with CPCs seemingly unwilling to apply the timetable (e.g. see WCPFC14 report). Based on this situation, MSC-certified fisheries with condition milestones for the achievement of a formal harvest strategy for this stock should, based on MSC procedures, be first scored at audit as 'behind target' and subsequently (the following year) have their certificates suspended if progress has not been made. The authors are unclear as to why fisheries on these stocks have been able to retain their certificates in the absence of any substantive progress up till now. Based on our understanding of the MSC standard, unless granted a special case (a variation request), these fisheries would not meet MSC certification requirements at this point." (…) **1.2.2.c:** "Under SA2.5.5, in order to conclude that 'available' HCRs are 'effective' (SG60), MSC requires evidence of i) the use of effective HCRs in other stocks or fisheries under the same management body; or ii) a formal agreement or framework with trigger levels which will require the development of a well-defined HCR. It also requires consideration of current exploitation rates in relation to biological reference points and the agreed trigger level (guidance for SA2.5.6: 'evidence that current F is equal to or less than FMSY				

		should usually be taken as evidence that the HCR is effective'). The authors are aware that this is not the same as the scoring applied in various MSC certifications for fisheries targeting this stock. The reasons for this are set out in the rationale for 1.2.2a above, and are primarily due to the different purpose of a pre-assessment and timing for meeting the MSC requirements. In our opinion, in order to meet MSC requirements at this stage, some demonstrable progress is required towards an effective formal harvest strategy (as per CMM 2014-06) such that it is more clear that management tools are likely to be able to maintain stocks at agreed target levels. The tools by which CMM 2017-01 is implemented for bigeye are as follows: • temporal / spatial limits on purse seine setting on FADs • restrictions on purse seine effort (days) • longline catch limits for bigeye The catch time series in the 2017 stock assessment runs to 2015 (not updated for the 2018 update assessment); the harvest strategy has only been in place since 2014, and is incremental, so it is hard to say what impact it has had on either purse seine or longline catch up till now. Estimated juvenile and adult fishing mortality has stabilised but there is no evidence as yet that it is decreasing. The improved perception of stock status is a consequence of structural changes in the stock assessment model, not a consequence of management. On this basis, there is no particular evidence that the various tools in place are effective in controlling fishing mortality, and no reason to suppose that the stock trajectory will not continue downwards. **On this basis, SG60 is not met**."				

3.1.3 - Long term objectives	According to the independent report, this PI would only meet SG80 at the regional level and, therefore, a full score would not be justified.	According to the independent report, this PI would only meet SG80 at the regional level. **IATTC** – "(…) Although the precautionary approach is in the Convention, it is less clear that it is applied in all policy. Reference points for bigeye do not appear to be particularly precautionary when taking into account significant uncertainties (although there may be evidence to support the values used), and precautionary action has not been taken to prevent the bigeye stock declining to current levels. In practice, there is no clear link between the convention and practical implementation of policy in all fisheries. Overall, clear explicit objectives incorporating the precautionary approach and ecosystem-based management in the policy meet the MSC Principles and Criteria, and therefore SG80. It is not clear that the precautionary approach is a requirement across all areas of policy, so **SG100 is not met**". **WCPFC** – "(…) While it appears to be a requirement, in practice it is less clear that the precautionary approach is applied in practice across all policy. Stock assessments in 2010, 2011 and 2014 indicate that bigeye fishing mortality exceeded levels consistent with MSY. While precautionary reference points have been set, there has not been a corresponding precautionary action that has reduced exploitation levels. Overall, clear explicit objectives incorporating the precautionary approach and ecosystem-based management in the policy meet the MSC Principles and Criteria, and defined, meeting SG80. However, it is not yet clear that the precautionary approach is applied in practice across all policy for all stocks, so **SG100 is not met**".	Medley et al. (2019)	80	This PI needs to be harmonised with other WCPFC fisheries and will be met partially at 90. This comment is focusing on the "required by management policy" part of this PI. Under the Convention, the Commission is required to apply the precautionary approach and while there are many examples of its application (e.g. adjustments to the CMMs following advice from the SC), there has been some stocks that have become overfished which suggests that management has not been sufficiently precautionary across all stocks.	Accepted (non-material score reduction)

3.2.1 - Fishery-specific objectives	According to the independent report, this PI would only meet SG80 at the regional level and, therefore, a partial score would not be justified.	According to the independent report, this PI would only meet SG80 at the regional level. **IATTC** – "(…) However, although broadly measurable, [conservation measures] are not necessarily well-defined, particularly in relation to achieving MSC P&C. Stock assessments are not available for all species (e.g. skipjack), and proxies for MSY have not been determined. Therefore, objectives may be somewhat vague with respect to determining precise status using reference points, for example. Certain resolutions and conservation measures might be presumed to achieve MSC objectives, but it is not certain. This would need to be evaluated for each specific fishery when undergoing MSC assessment. The scientific advice is based on MSC Principles 1 and 2, because these objectives are implicit in the management of each stock, meeting SG60. In addition, explicit objectives are provided through the resolutions and recommendations, which determine the aim and intention of the conservation measures. In most cases, this meets SG80. However, these objectives are not stock specific and often cannot be determined to be entirely consistent with the requirements of MSC Principles 1 and 2, since they are related to the conservation measure rather than the stocks or species. Therefore, **SG100 is not met**". **WCPFC** – "(…) Because the conservation measures contain reasonably explicit and specific intentions and objectives, and also allow for evaluation of the performance against these objectives, the fisheries meet SG80. However, although broadly measurable, they are not necessarily well-defined particularly in relation to achieving MSC P&C. For skipjack there is now an explicit target set out in 15-06. For bigeye and yellowfin, it is also relatively clear, for albacore less so. But for most fisheries, 100 wouldn't be met because there is not a full suite of well-defined and measurable	Medley et al. (2019)	80	Agree. A score of 80 at the regional WCPFC level was awarded in the ACDR.	Accepted (no score change)

		objectives for P2 (…). Objectives may be somewhat vague with respect to determining precise status using reference points, for example, and allowing for unspecified qualifications. Certain resolutions and conservation measures might be presumed to achieve MSC objectives, but it is not certain. A higher score might be possible should WCPFC develop reference points directly linked to proscribed management action, as would be applied through a harvest control rule, for example. This would need to be evaluated for each specific fishery when undergoing MSC assessment. The scientific advice is based on MSC Principles 1 and 2, because these objectives are implicit in the management of each stock, meeting SG60. In addition, effectively explicit objectives are provided through the conservation and management measures. In most cases, this should meet SG80. However, with the qualifications, it may not be possible to determine whether these are consistent with the requirements of MSC Principles 1 and 2, since they are related to the conservation measure itself rather than the stocks, species or ecosystem. Therefore, **SG100 cannot be met**."				

3.2.2 - Decision-making processes	The independent report by Medley et al. (2019) indicates that, at the regional level, the overall PI score for this fishery would be less than 80 for WCPFC.	The independent report by Medley et al. (2019) indicates that, at the regional level (WCPFC), the overall PI score for this fishery would be less than 80. Main difference with preliminary scores in the ACDR lies under SI (b): **3.2.2.b**: "At the WCPFC the decision-making is transparent and transparency is a requirement of the Convention (Article 21). Decisions are transparent and published as a resolution from the annual meetings, and initial positions and the information used for the basis of the decision is available (as technical reports provided to the meeting or as proposals for resolutions from some Parties), The decision-making is adaptive in that the various specialist meetings evaluate decisions and feedback is provided to the Commission. The Commission can be shown to react appropriately. WCPFC decision-making processes allow consideration of serious and important issues through its committees (SC and TCC) and at the Commission itself. Stock assessments and studies presented at the SC (predominantly by SPC) identify serious issues, such as overfishing (e.g. Bigeye tuna) at the regional level. These issues are addressed through regionally agreed CMMs. A series of measures to control catch and effort within the WCPF Convention area were taken in 2013. However, although overall the decision-making is adequate for most of the stocks being considered and serious issues have been responded to, some important issues have not. The declining SP albacore catch rates comes under 'other important issues' (not yet 'serious' because the stock is above MSY reference points). At a presentation by SPC at the Thirteenth Session of WCPFC in December 2016 concerning the status of the tuna stocks it was stated that the southern albacore stocks were not overfished but that due to the declining CPUE there were concerns over economic viability. WCPFC has not addressed this important issue. It can be shown that regional	Medley et al. (2019)	75	This PI focusses on decision making processes that result in measures to achieve the objectives, which for the WCPFC is the long term conservation and sustainable use of highly migratory fish stocks. It is important to note that concerns over the declining albacore catch rates were not due to overfishing but due to economic viability. While this may be considered an important issue, it is not directly related to WCPFC's objectives. In any case, for the albacore example, the WCPFC has responded and an interim TRP was set at the 15th Session of the WCPFC in December 2018 with the aim of increasing the CPUE. Decision making for this example is often linked to harvest control rules which is assessed in Principle 1. There are several examples of new and amended CMMs that demonstrate that the WCPFC responds to serious and other important issues in a transparent (e.g. reports and papers on the website), timely (i.e. at the annual Commission meetings)	Not accepted (no score change)

		decision making processes deal with serious issues identified, in a transparent timely and adaptive manner but not some of the important issues. In particular one of the target species for this assessment, albacore, has shown a steady decline in economic viability over recent years, and WCPFC have not responded in a timely responsive way to halt this decline. Overall the decision-making is adequate for the stocks being considered. It can be shown that it deals with serious but not always important issues for example SP albacore in a transparent, timely and adaptive manner meeting SG60 but **does not meet SG80 at this time**."			and adaptive manner (using best available information from the Scientific Committee) which resulted in a proposed score of 80 for this scoring issue. SG100 was not awarded as the extent to which WCPFC responds to ALL issues is uncertain.	

General comments

General comments	Evidence or references	CAB response to stakeholder input	CAB Response Code
Letter of support The ACDR states that the CAB will likely set conditions for Principle 1 stocks regarding PI 1.2.1 (Harvest strategy) and 1.2.2 (Harvest control rules & tools). Taking into account that the Australian Fisheries Management Authority (AFMA) will probably have a relevant role in the action plan for these conditions, ISSF is concerned that, without a letter of support from AFMA, there is no clear expectation that the Client Action Plan will achieve its objectives. ISSF notes that such a letter was received for the previous assessment of the fishery, and recommends that a letter from AFMA confirming their continued engagement and support of the fishery's re-assessment is included in the PCDR.	Gascoigne et al. (2015)	AFMA has been consulted with, reviewed the draft ACDR and consulted with the client on the developing the client action plan. A letter of support will be appended to the PCDR.	Accepted (no score change)
Conditions on HS and HCR ISSF supports the CAB's intention to set conditions towards implementation by WCPFC and IATTC of robust Harvest Strategies and Harvest Control Rules for Principle 1 species. As regards the future Client Action Plan to meet these conditions, ISSF would like to suggest a series of specific actions for the Client to consider: 1) Sign onto future NGO Tuna Forum global RFMO appeals 2) Continue to advocate for accelerated progress on the adoption and implementation of Harvest Strategies and Harvest Control Rules through the WCPFC and IATTC, such as through continued direct engagement with national delegations to the Commissions, or through the newly reconstituted WCPO MSC alignment network which advocates for harvest strategies and other priorities; and 3) Publicly support ISSF Position Statements that contain detailed asks on Harvest Strategies and Harvest Control Rules to future WCPFC and IATTC Regular Sessions of the Commission and document that support (e.g. by submitting a letter or some other communication citing the Position Statement).		The CAB discussed these comments with the client. Ultimately it will be up to the client to decide what are the most appropriate actual to meet the conditions.	Accepted (no score change)

8.3 Client Action Plan

Table 29– Condition 1 Yellowfin	
Performance Indicator	PI 1.2.1
Score	70
Justification	*See* Rationale for this PI in section 7.2.3
Condition	By the third surveillance audit, demonstrate that the harvest strategy for yellowfin tuna is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.
Milestones	Year 1 (2021): the client will provide evidence that it is actively working to ensure that the harvest strategy for WCPO yellowfin is responsive to the state of the stock and that the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 2 (2022): the client will provide evidence that it is actively working to ensure that the harvest strategy for WCPO yellowfin is responsive to the state of the stock and that the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 3 (2023): provide evidence that a harvest strategy has been adopted for WCPO yellowfin that is responsive to the state of the stock and in which the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. (Score 80).
Client action plan	Tuna Australia recognises the need to work collaboratively with the Australian government and the WCPFC ensuring regional management of Yellowfin Tuna meets sustainability reference points and harvest strategy goals. Tuna Australia does, and will continue to advocate, for the WCPFC management of tuna stocks to replicate Australian best practice in fisheries management. Tuna Australia notes that the MSC has mandated the closure of conditions associated with WCPO tuna fisheries by 2021. Recent WCPFC deliberations have set a revised work plan for the implementation of target reference points and harvest strategies for WCPO tuna stocks which is not consistent with current MSC timelines. This matter is outside of the remit of Tuna Australia to implement. However, Tuna Australia is committed to

	influencing Australia's interests through advocacy, regular meetings with the Department of Agriculture, Water and Environment, (DAWE) and representation on the Australian delegation at WCPFC meetings. At the time of preparation of the ETBF MSC public comment draft report, the impact of COVID - 19 on the world was not clear. This pandemic may impact the ability of the WCPFC to continue its workplan for WCPO tuna stocks in the short to medium-term. In light of the current unprecedented circumstances, Tuna Australia advocates a common-sense approach to staging its "client actions" across the timeline of the certification so that realistic deliverables and improvements against the conditions can be met. Therefore, Tuna Australia proposes the following approach to milestone delivery: Year 1 (2021): Understanding the status and likely timeline for the WCPFC to become fully operational in the regional fishery management landscape and report back to MSC on the feasibility of meeting condition closure. Evidence will be provided by Tuna Australia on active engagement with relevant Australian government departments (DAWE and AFMA), information conveyed to members on the status of WCPFC, its decisions, and plans to continue to operate. Provide industry representation to the Australian delegation at annual WCPFC meeting and advocate for the setting of a target reference point for Yellowfin Tuna. At a domestic level, participate in Tropical Tuna Management Advisory Committee and Resource Assessment Group meetings to maintain strong domestic management arrangements for Yellowfin Tuna, while ensuring catch allocation is set at a level ensuring sustainable and profitable fishing operations. Evidence will be provided that Tuna Australia has been actively engaged and participated in these processes at the first surveillance audit. Year 2 (2022): Tuna Australia will provide industry representation to the Australian delegation at the regular session of the WCPFC commission meeting and strongly advocate for a Target Reference Point for the fishery. In addition, Tuna Australia will lobby relevant government departments in the lead up to the WCPFC regular meeting to ensure the government understands the importance of a TRP. Tuna Australia will report on its engagement actions against this milestone at the second surveillance audit. Year 3 (2023): Tuna Australia will advocate for the adoption of harvest control rules and management strategy evaluation model for Yellowfin Tuna. Tuna Australia will engage with the AFMA and DAWE representatives in the lead up to the WCPFC regular meeting and encourage the AFMA to identify opportunities in its annual work plan to progress and assist the development of harvest control rules and management strategy evaluation framework at a regional level. Evidence for these actions will be provided via an update to the surveillance audit of Tuna Australia's efforts to advocate for the implementation of harvest control rules and management strategy evaluation for Yellowfin Tuna
Consultation on condition	The client action plan has been developed by Tuna Australia and reviewed by AFMA. AFMA has committed to support the actions (see support letter below).

Table 30– Condition 2 Yellowfin

Performance Indicator	PI 1.2.2
Score	60
Justification	See rationale for PI in section 7.2.3
Condition	SI a) By the third surveillance audit, demonstrate that well defined HCRs are in place for yellowfin tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. SI b) By the third surveillance audit, provide evidence that the selection of the harvest control rules for yellowfin tuna are robust to the main uncertainties. SI c) By the third surveillance audit, provide evidence that indicates that the tools in use for yellowfin tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.
Milestones	Year 1 (2021): the client will provide evidence that it is actively working to ensure that well defined HCRs are in place for yellowfin tuna that a) reduce the exploitation rate as the PRI is approached, and are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, b) have been selected so that they are robust to the main uncertainties, c) and are appropriate and effective in achieving the required exploitation levels. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 2 (2022): the client will provide evidence that it is actively working to ensure that well defined HCRs are in place for yellowfin tuna that a) reduce the exploitation rate as the PRI is approached, and are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, b) have been selected so that they are robust to the main uncertainties, c) and are appropriate and effective in achieving the required exploitation levels. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 3 (2023): provide evidence that harvest control rules with the above characteristics are in place for Yellowfin. (Score 80).

Client action plan	Year 1 (2021): Understanding the status and likely timeline for the WCPFC to become fully operational in the regional fishery management landscape and report back to MSC on the feasibility of meeting condition closure. Evidence will be provided by Tuna Australia on active engagement with relevant Australian government departments (DAWE and AFMA), information conveyed to members on the status of WCPFC, its decisions, and plans to continue to operate. Provide industry representation to the Australian delegation at annual WCPFC meeting and advocate for the setting of a target reference point for Yellowfin Tuna. At a domestic level, participate in Tropical Tuna Management Advisory Committee and Resource Assessment Group meetings to maintain strong domestic management arrangements for Yellowfin Tuna, while ensuring catch allocation is set at a level ensuring sustainable and profitable fishing operations. Evidence will be provided that Tuna Australia has been actively engaged and participated in these processes at the first surveillance audit. Year 2 (2022): Tuna Australia will provide industry representation to the Australian delegation at the regular session of the WCPFC commission meeting and strongly advocate for a Target Reference Point for the fishery. In addition, Tuna Australia will lobby relevant government departments in the lead up to the WCPFC regular meeting to ensure the government understands the importance of a TRP. Tuna Australia will report on its engagement actions against this milestone at the second surveillance audit. Year 3 (2023): Tuna Australia will advocate for the adoption of harvest control rules and management strategy evaluation model for Yellowfin Tuna. Tuna Australia will engage with the AFMA and DAWE representatives in the lead up to the WCPFC regular meeting and encourage the AFMA to identify opportunities in its annual work plan to progress and assist the development of harvest control rules and management strategy evaluation framework at a regional level. Evidence for these actions will be provided via an update to the surveillance audit of Tuna Australia's efforts to advocate for the implementation of harvest control rules and management strategy evaluation for Yellowfin Tuna
Consultation on condition	The client action plan has been developed by Tuna Australia and reviewed by AFMA. AFMA has committed to support the actions (see support letter below).

Table 31 – Condition 3 Albacore	
Performance Indicator	PI 1.2.1
Score	70
Justification	See rationale for PI in section 7.2.3
Condition	By the third surveillance audit, demonstrate that the harvest strategy for albacore tuna is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits

	in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.
Milestones	Year 1 (2021): the client will provide evidence that it is actively working to ensure that the harvest strategy for WCPO albacore is responsive to the state of the stock and that the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 2 (2022): the client will provide evidence that it is actively working to ensure that the harvest strategy for WCPO albacore is responsive to the state of the stock and that the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 3 (2023): provide evidence that a harvest strategy has been adopted for WCPO albacore that is responsive to the state of the stock and in which the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. (Score 80).
Client action plan	The regional work to implement a harvest strategy for Albacore is more advanced than for other WCPO tuna species. An interim target reference point for Albacore was agreed to in 2018. Further work to implement a harvest strategy and harvest control rules was not completed in 2019 and the impact of COVID - 19 on the future work of the WCPFC is not yet known. It was further recognised at WCPFC 16 that a revised stock assessment for Albacore due in 2021 may have flow on effects on the current interim target reference point and identified 2022 as the timeline to adopt a harvest control rules and management strategy evaluation for this stock. Therefore, the client action plan to address the condition milestones above is proposed: Year 1 (2021): Understanding the status and likely timeline for the WCPFC to become fully operational in the regional fishery management landscape and report back to MSC on the feasibility of meeting condition closure. Evidence will be provided by Tuna Australia on how we have actively engaged with relevant Australian government departments, conveyed information to members on the status of WCPFC and monitoring of information from WCPFC on plans to continue to operate. Provide industry representation to the Australian delegation at annual WCPFC meeting and advocate for the setting on a revised TRP for Albacore (if required as a result of the 2021 stock assessment). At a domestic level, participate in Management Advisory Committee and Resource Assessment Group meetings to maintain strong domestic arrangements for Albacore Tuna management while ensuring quota is available to sustain profitable fishing operations. Evidence will be provided that Tuna Australia has been actively engaged in these processes at this surveillance audit. Year 2 (2022): Tuna Australia will continue to participate in the Australian delegation in WCPFC deliberations and will strongly advocate for a harvest control rules and a management strategy evaluation to be adopted by the WCPFC. In addition, Tuna Australia will lobby relevant government departments

	in the lead up to WCPFC to ensure this matter is of the highest importance on its agenda at that forum. Tuna Australia will report on its engagement actions against this milestone at the second surveillance audit. Year 3 (2023): Tuna Australia will continue to participate in the Australian delegation in WCPFC deliberations and will strongly advocate for a harvest control rules and a management strategy evaluation to be adopted by the WCPFC. In addition, Tuna Australia will lobby relevant government departments in the lead up to WCPFC to ensure this matter is of the highest importance on its agenda at that forum. Tuna Australia will report on its engagement actions against this milestone at the second surveillance audit.
Consultation on condition	The client action plan has been developed by Tuna Australia and reviewed by AFMA. AFMA has committed to support the actions (see support letter below).

Table 32 – Condition 4 Albacore	
Performance Indicator	PI 1.2.2
Score	60
Justification	See rationale for PI in section 7.2.3
Condition	SI a) By the third surveillance audit, demonstrate that well defined HCRs are in place for albacore tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. SI b) By the third surveillance audit, provide evidence that the selection of the harvest control rules for albacore tuna are robust to the main uncertainties. SI c) By the third surveillance audit, provide evidence that indicates that the tools in use for albacore tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.
Milestones	Year 1 (2021): the client will provide evidence that it is actively working to ensure that well defined HCRs are in place for albacore tuna that a) reduce the exploitation rate as the PRI is approached, and are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, b) have been selected so that they are robust to the main uncertainties, c) and are appropriate and effective in achieving the required exploitation levels. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70).

	Year 2 (2022): the client will provide evidence that it is actively working to ensure that well defined HCRs are in place for albacore tuna that a) reduce the exploitation rate as the PRI is approached, and are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, b) have been selected so that they are robust to the main uncertainties, c) and are appropriate and effective in achieving the required exploitation levels. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 3 (2023): provide evidence that harvest control rules with the above characteristics are in place for albacore. (Score 80).
Client action plan	Year 1 (2021): Understanding the status and likely timeline for the WCPFC to become fully operational in the regional fishery management landscape and report back to MSC on the feasibility of meeting condition closure. Evidence will be provided by Tuna Australia on how we have actively engaged with relevant Australian government departments, conveyed information to members on the status of WCPFC and monitoring of information from WCPFC on plans to continue to operate. Provide industry representation to the Australian delegation at annual WCPFC meeting and advocate for the setting on a revised TRP for Albacore (if required as a result of the 2021 stock assessment). At a domestic level, participate in Management Advisory Committee and Resource Assessment Group meetings to maintain strong domestic arrangements for Albacore Tuna management while ensuring quota is available to sustain profitable fishing operations. Evidence will be provided that Tuna Australia has been actively engaged in these processes at this surveillance audit. Year 2 (2022): Tuna Australia will continue to participate in the Australian delegation in WCPFC deliberations and will strongly advocate for a harvest control rules and a management strategy evaluation to be adopted by the WCPFC. In addition, Tuna Australia will lobby relevant government departments in the lead up to WCPFC to ensure this matter is of the highest importance on its agenda at that forum. Tuna Australia will report on its engagement actions against this milestone at the second surveillance audit. Year 3 (2023): Tuna Australia will continue to participate in the Australian delegation in WCPFC deliberations and will strongly advocate for a harvest control rules and a management strategy evaluation to be adopted by the WCPFC. In addition, Tuna Australia will lobby relevant government departments in the lead up to WCPFC to ensure this matter is of the highest importance on its agenda at that forum. Tuna Australia will report on its engagement actions against this milestone at the second surveillance audit.
Consultation on condition	The client action plan has been developed by Tuna Australia and reviewed by AFMA. AFMA has committed to support the actions (see support letter below).

Table 33– Condition 5 Bigeye

Performance Indicator	PI 1.2.1
Score	70
Justification	See rationale for PI in section 7.2.3
Condition	By the third surveillance audit, demonstrate that the harvest strategy for bigeye tuna is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.
Milestones	Year 1 (2021): the client will provide evidence that it is actively working to ensure that the harvest strategy for WCPO bigeye is responsive to the state of the stock and that the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 2 (2022): the client will provide evidence that it is actively working to ensure that the harvest strategy for WCPO bigeye is responsive to the state of the stock and that the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 3 (2023): provide evidence that a harvest strategy has been adopted for WCPO bigeye that is responsive to the state of the stock and in which the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. (Score 80).
Client action plan	The status of Bigeye regional management arrangements is at the same stage as for Yellowfin Tuna. Therefore, it is anticipated that a TRP for Bigeye will not be determined until 2022, with associated harvest control rules and management strategy evaluation approved in the following year. The rationale for the following actions is therefore like those specified for Yellowfin Tuna: Year 1 (2021): Understanding the status and likely timeline for the WCPFC to become fully operational in the regional fishery management landscape and report back to MSC on the feasibility of meeting condition closure. Evidence will be provided by Tuna Australia on active engagement with relevant Australian government departments (DAWE and AFMA), information conveyed to members on the status of WCPFC, its decisions, and plans to continue to operate. Provide industry representation to the Australian delegation at annual WCPFC meeting and advocate for the setting of a target reference point for Bigeye Tuna. At a domestic level, participate in Tropical Tuna Management Advisory Committee and Resource Assessment Group meetings to maintain

	strong domestic management arrangements for Bigeye Tuna, while ensuring catch allocation is set at a level ensuring sustainable and profitable fishing operations. Evidence will be provided that Tuna Australia has been actively engaged and participated in these processes at the first surveillance audit. Year 2 (2022): Tuna Australia will provide industry representation to the Australian delegation at the regular session of the WCPFC commission meeting and strongly advocate for a Target Reference Point for the fishery. In addition, Tuna Australia will lobby relevant government departments in the lead up to the WCPFC regular meeting to ensure the government understands the importance of a TRP. Tuna Australia will report on its engagement actions against this milestone at the second surveillance audit. Year 3 (2023): Tuna Australia will advocate for the adoption of harvest control rules and management strategy evaluation model for Bigeye Tuna. Tuna Australia will engage with the AFMA and DAWE representatives in the lead up to the WCPFC regular meeting and encourage the AFMA to identify opportunities in its annual work plan to progress and assist the development of harvest control rules and management strategy evaluation framework at a regional level. Evidence for these actions will be provided via an update to the surveillance audit of Tuna Australia's efforts to advocate for the implementation of harvest control rules and management strategy evaluation for Bigeye Tuna
Consultation on condition	The client action plan has been developed by Tuna Australia and reviewed by AFMA. AFMA has committed to support the actions (see support letter below).

Table 34 – Condition 6 Bigeye	
Performance Indicator	PI 1.2.2
Score	60
Justification	See rationale for PI in section 7.2.3
Condition	SI a) By the third surveillance audit, demonstrate that well defined HCRs are in place for bigeye tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. SI b) By the third surveillance audit, provide evidence that the selection of the harvest control rules for bigeye tuna are robust to the main uncertainties. SI c) By the third surveillance audit, provide evidence that indicates that the tools in use for bigeye tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules. Under advice from MSC (February 2019) in response to a joint CAB variation request, the deadline for closing harvest strategy conditions for all WCPFC tuna fisheries is 2021 and the evidence for this would have been evaluated in audits in 2022 after the December 2021 WCPFC meetings had been concluded. However, consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.

Milestones	Year 1 (2021): the client will provide evidence that it is actively working to ensure that well defined HCRs are in place for bigeye tuna that a) reduce the exploitation rate as the PRI is approached, and are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, b) have been selected so that they are robust to the main uncertainties, c) and are appropriate and effective in achieving the required exploitation levels. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 2 (2022): the client will provide evidence that it is actively working to ensure that well defined HCRs are in place for bigeye tuna that a) reduce the exploitation rate as the PRI is approached, and are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, b) have been selected so that they are robust to the main uncertainties, c) and are appropriate and effective in achieving the required exploitation levels. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 3 (2023): provide evidence that harvest control rules with the above characteristics are in place for bigeye. (Score 80).
Client action plan	Year 1 (2021): Understanding the status and likely timeline for the WCPFC to become fully operational in the regional fishery management landscape and report back to MSC on the feasibility of meeting condition closure. Evidence will be provided by Tuna Australia on active engagement with relevant Australian government departments (DAWE and AFMA), information conveyed to members on the status of WCPFC, its decisions, and plans to continue to operate. Provide industry representation to the Australian delegation at annual WCPFC meeting and advocate for the setting of a target reference point for Bigeye Tuna. At a domestic level, participate in Tropical Tuna Management Advisory Committee and Resource Assessment Group meetings to maintain strong domestic management arrangements for Bigeye Tuna, while ensuring catch allocation is set at a level ensuring sustainable and profitable fishing operations. Evidence will be provided that Tuna Australia has been actively engaged and participated in these processes at the first surveillance audit. Year 2 (2022): Tuna Australia will provide industry representation to the Australian delegation at the regular session of the WCPFC commission meeting and strongly advocate for a Target Reference Point for the fishery. In addition, Tuna Australia will lobby relevant government departments in the lead up to the WCPFC regular meeting to ensure the government understands the importance of a TRP. Tuna Australia will report on its engagement actions against this milestone at the second surveillance audit. Year 3 (2023): Tuna Australia will advocate for the adoption of harvest control rules and management strategy evaluation model for Bigeye Tuna. Tuna Australia will engage with the AFMA and DAWE representatives in the lead up to the WCPFC regular meeting and encourage the AFMA to identify opportunities in its annual work plan to progress and assist the development

	of harvest control rules and management strategy evaluation framework at a regional level. Evidence for these actions will be provided via an update to the surveillance audit of Tuna Australia's efforts to advocate for the implementation of harvest control rules and management strategy evaluation for Bigeye Tuna
Consultation on condition	The client action plan has been developed by Tuna Australia and reviewed by AFMA. AFMA has committed to support the actions (see support letter below).

Table 35 – Condition 7 Swordfish	
Performance Indicator	PI 1.2.1
Score	70
Justification	See rationale for PI in section 7.2.3
Condition	By the third surveillance audit, demonstrate that the harvest strategy for swordfish is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. Consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.
Milestones	Year 1 (2021): the client will provide evidence that it is actively working to ensure that the harvest strategy for WCPO swordfish is responsive to the state of the stock and that the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 2 (2022): the client will provide evidence that it is actively working to ensure that the harvest strategy for WCPO swordfish is responsive to the state of the stock and that the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome in alignment with the WCPFC 2017 agreed work plan. (Score: 70). Year 3 (2023): provide evidence that a harvest strategy has been adopted for WCPO swordfish that is responsive to the state of the stock and in which the elements of the harvest strategy work together towards achieving the management objectives reflected PI 1.1.1 SG80. (Score 80).
Client action plan	Year 1 (2021): The current ETBF harvest strategy for Swordfish is being redeveloped. Noting the expected impacts of COVID 19 on the ability of AFMA and its management committees to progress a revised harvest strategy for Swordfish, Tuna Australia will advocate for work to continue to progress this matter. Tuna Australia is currently representing industry in a small working group dedicated to progressing the swordfish harvest strategy. Work to date has outlined a range of candidate harvest control rules, tuning targets and operating models for the revised harvest strategy which is now with relevant management committees for further consideration. Tuna Australia sees no impediment to the implementation of a revised harvest

	strategy being finalised and implemented by the first surveillance audit. This is consistent with the milestones and timelines identified in the FRDC project proposal which is funding the redevelopment of the swordfish harvest strategy. Year 2 (2022): The current ETBF harvest strategy for Swordfish is being redeveloped and Tuna Australia will advocate for work to continue to progress this matter. Year 3 (2023): Tuna Australia will seek to ensure that the harvest strategy is adopted and working as intended. This will be achieved by participation in relevant management committee meetings and participation in a harvest strategy review when conducted. Tuna Australia will report on the actions it has undertaken to help finalise the harvest strategy and monitor its performance. At a regional level, Tuna Australia supports the development of regional management arrangements for Swordfish to curtail effort currently occurring in the high seas areas of the WCPFC convention area. This high seas effort currently continues unchecked, and may cause sustainability issues if not managed effectively by the WCPFC. Tuna Australia will continue to advocate for regional management arrangements for Swordfish to be agreed to and implemented within the life of this certification. This will be evidenced by Tuna Australia's continued participation on the Australian delegation to WCPFC and liaison with relevant government departments.
Consultation on condition	The client action plan has been developed by Tuna Australia and reviewed by AFMA. AFMA has committed to support the actions (see support letter below).

Table 36 – Condition 8 Swordfish	
Performance Indicator	PI 1.2.2
Score	60
Justification	See rationale for PI in section 7.2.3
Condition	SI a) By the third surveillance audit, demonstrate that well defined HCRs are in place for swordfish that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. SI b) By the third surveillance audit, provide evidence that the selection of the harvest control rules for swordfish are robust to the main uncertainties. SI c) By the third surveillance audit, provide evidence that indicates that the tools in use for swordfish are appropriate and effective in achieving the exploitation levels required under the harvest control rules. Consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months. Therefore, the deadline for this condition is 2023.
Milestones	Year 1 (2021): the client will provide evidence that it is actively working to ensure that well defined HCRs are in place for swordfish that

	a) reduce the exploitation rate as the PRI is approached, and are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, b) have been selected so that they are robust to the main uncertainties, c) and are appropriate and effective in achieving the required exploitation levels. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome. (Score: 70). Year 2 (2022): the client will provide evidence that it is actively working to ensure that well defined HCRs are in place for swordfish that a) reduce the exploitation rate as the PRI is approached, and are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, b) have been selected so that they are robust to the main uncertainties, c) and are appropriate and effective in achieving the required exploitation levels. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome. (Score: 70). Year 3 (2023): provide evidence that harvest control rules with the above characteristics are in place for swordfish. (Score 80).
Client action plan	For reasons noted in Condition 7, the implementation of harvest control rules is dependent on the approval and implementation of the revised harvest strategy. It is anticipated that the revised harvest strategy will be implemented in the second half of 2020. Tuna Australia will report to the MSC on the implementation and performance of harvest control rules at each surveillance audit.
Consultation on condition	The client action plan has been developed by Tuna Australia and reviewed by AFMA. AFMA has committed to support the actions (see support letter below).

Table 37– Condition 9	
Performance Indicator	2.1.2: There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch. SI(c): There is some evidence that the measures/partial strategy is being implemented successfully.
Score	75
Justification	Argentine squid (AS): There is an uncertain amount of IUU activity occurring in the fishery and it has been reported that the management objective has not been met in recent years. Recent stock assessment information is not available. Therefore, it is uncertain whether the partial strategy is being implemented successfully. SG80 is not met.

Condition	For main primary species used as bait in the UoA, evidence shall be available at the fourth surveillance audit that demonstrates the successful implementation of a partial strategy to maintain or to not hinder stock rebuilding at/to levels which are highly likely to be above the PRI.
Milestones	Year 1 (2021): A plan has been developed that sets out the approach to providing evidence and how evidence provided will address the requirements of this scoring issue. Resulting score: 75 Years 2-3 (2022-2023): The plan developed in Year 1 has been implemented. Evidence is accumulated to address the requirements of the scoring issue. Resulting score: 75 Year 4 (2024): Some evidence is available that shows the partial strategy is being implemented successfully. Resulting score: 80
Client action plan	The use of Argentine Squid (Illex) in the fishery is currently decreasing as increasing bait prices are being driven by consumer demand for food grade squid in China and elsewhere. Similarly, price fluctuations have also been driven by the inconsistency of yearly catches. These recent price impacts on the fishery have caused a change to fishing strategy and reduced use of Argentine Squid in some instances. Any client action plan for this species needs to be mindful about the lack of regional fisheries management body to effectively engage with and the lack of effective domestic management of the species. Therefore, Tuna Australia proposes the following action plan to transition industry to less reliance on this species in their fishing effort. Year 1 (2021): Develop a project plan to investigate alternate bait sources with the same efficacy as Argentine Squid. 1. Assess suitable squid species from fisheries with better fisheries management 2. Monitor management improvements in the Argentinian Squid fishery 3. Investigate supply chain reliability and economics of transitioning to alternate bait sources. 4. Investigate the potential of non-scope baits (e.g. artificial baits) Year 2 – 3 (2022 -2023): Engage with industry on implementing the articles of the plan 1. Provide information to industry on alternate bait sources and available quantities, supply chains and prices 2. Encourage trialling of new bait sources that meet condition 9 3. Explore artificial baits for potential trials in the fishery and distribute to project boats 4. Monitor bait use types and volumes in the fishery Year 3 (2023): Tuna Australia will identify appropriate bait types and sources. TA will encourage and communicate preference for its members to adopt alternative baits identified following investigations and trials. Year 4 (2024): Tuna Australia will conduct a desk top analysis of the change in volumes and bait types used in the fishery and deliver the findings of this analysis to the 4th year surveillance audit. It is anticipated that the initiatives and testing of alternate bait sources identified in the project plan will show a shift in bait use. The analysis should demonstrate

	that bait strategies used across the sector have evolved towards provenance from a sustainable and well managed fishery or is out of scope. A shift in bait use to other species may demonstrate a change to the catch composition of Principle 1 species (esp. for Swordfish) and this will be captured in the analysis. Tuna Australia will also actively monitor any improvements in the management of the Illex Squid fishery (including reported reductions in IUU fishing, implementation of new management arrangements etc) and report these findings to the 4th surveillance audit also.
Consultation on condition	The client action plan has been developed by Tuna Australia and reviewed by AFMA. AFMA has committed to support the actions (see support letter below).

AFMA support letter

Australian Government
Australian Fisheries Management Authority

REF: 2019/0723/015

11 May 2020

Mr David Ellis
Chief Executive Officer
Tuna Australia
PO Box 1220
Buderim QLD 4556

Dear Mr Ellis

Re: Letter of support for Marine Stewardship Council Certification of Tuna Australia.

I am writing to confirm the support of the Australian Fisheries Management Authority (AFMA) for the Marine Stewardship Council's (MSC) certification process being pursued for the Eastern Tuna and Billfish Fishery (ETBF) by Tuna Australia Pty Ltd.

I note that in response to the MSC's assessment, and the conditions which need to be addressed in the ETBF for Tuna Australia to receive and maintain certification, Tuna Australia has developed a Client Action Plan. AFMA commits to supporting Tuna Australia in achieving the actions proposed in the Client Action Plan, including through:

- Information and data support and attendance at annual audit meetings
- Continuing its active role in the Australian Government's push to progress the Western and Central Pacific Fisheries Commission's (WCPFC) Harvest Strategy Work Plan.
- Continuing its active role in the Australian Government's push to strengthen regional (WCPFC) management of South West Pacific Swordfish.
- Developing and implementing a domestic ETBF harvest strategy for Swordfish.

I would like to take this opportunity to congratulate Tuna Australia on its efforts in the assessment process and wish it all the best in attaining MSC accreditation. AFMA will continue to work closely and effectively with you throughout this process.

Yours sincerely

Anna Willock
Executive Manager
Fisheries Management Branch

Canberra
PO Box 7051
Canberra ACT 2610
P 02 6225 5555
F 02 6225 5500

Darwin
PO Box 131
Darwin NT 0801
P 08 8943 0333
F 08 8942 2897

Thursday Island
PO Box 376
Thursday Island QLD 4875
P 07 4069 1990
F 07 4069 1277

Lakes Entrance
PO Box 408
Lakes Entrance VIC 3909
P:0447 019 916

8.4 Surveillance

Table 40 – Fishery surveillance program				
Surveillance level	Year 1	Year 2	Year 3	Year 4
Level 4	Off-site surveillance audit	On-site surveillance audit	Off-site surveillance audit	On-site surveillance audit & re-certification site visit

Table 41 – Timing of surveillance audit			
Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	August 2021	August 2021	As per FCP 7.28.8 CABs shall undertake audits within 30 days prior to the anniversary date. Also, fishing in the sector often concludes in August of each season.
2	August 2022	August 2022	As above
3	August 2023	August 2023	As above
4	August 2024	October 2024	The fourth audit will be conducted together with the site visit for the second reassessment.

Table 42 – Surveillance level rationale			
Year	Surveillance activity	Number of auditors	Rationale
1 and 3	Offsite audit	Offsite audit, 2 auditors off-site	Level 4 surveillance level has been chosen as this is the second certification period and there are 9 conditions across the 4 UoA (across 2 Principles)

8.5 Harmonised fishery assessments

To be completed at Public Certification Report stage

Principle 1: Harmonisation is required as per the CAB-wide Mega- Variance for RFMO highly migratory stocks including yellowfin tuna, albacore tuna and bigeye tuna. Rescoring of yellowfin and albacore was undertaken as part of the 4th annual surveillance report. Bigeye was previously a P2 species that is considered under P1 in this re-assessment. There are no other assessments of broadbill swordfish with which to harmonise

Principle 2: Not required.

Principle 3: The Fishery shares the Australian management system with the Fisheries listed in Table 43 below and harmonisation is therefore required with the Governance and Policy PIs (3.1.1 - 3.1.3). The scores for Performance Indicators under 3.1 have been harmonised.

Table 43 – Overlapping fisheries

Fishery name	Certification status and date	Performance Indicators to harmonise
1. South East Australia Small Pelagic Fishery	Certified since August 2019	3.1.1, 3.1.2, 3.1.3
2. Northern Prawn Fishery	Certified since November 2012	3.1.1, 3.1.2, 3.1.3
3. Australian Blue Grenadier Fishery	Certified since August 2015	3.1.1, 3.1.2, 3.1.3
4. Heard and McDonald Islands Toothfish and Icefish	Certified since March 2012	3.1.1, 3.1.2, 3.1.3
5. Macquarie Island Toothfish	Certified since May 2012	3.1.1, 3.1.2, 3.1.3
6. Walker Seafoods albacore, yellowfin and swordfish fishery	Certified since August 2015	3.1.1, 3.1.2, 3.1.3

Table 44 – Scoring differences

Performance Indicators (PIs)	Fisheries					
	1	2	3	4	5	6
3.1.1	100	100	100	100	100	85
3.1.2	100	100	100	100	100	85
3.1.3	100	100	100	100	100	90

Differences between scoring are listed above in Table 44 and are only apparent between this fishery (Walker Seafoods) and all other certified AFMA managed fisheries. The scoring of the Walker PIs have been harmonised during the re-assessment process (this report).

The 3.1 PIs have also been harmonised with other WCPFC certified fisheries listed below (Table 45). Any differences in scores with these fisheries are attributed to differences in the relevant national overarching management regime.

Table 45: Hyperlinks to MSC certified fisheries under WCPFC management:

- https://fisheries.msc.org/en/fisheries/szlc-csfc-fzlc-fsm-eez-longline-yellowfin-and-bigeye-tuna/@@view

- https://fisheries.msc.org/en/fisheries/pt-citraraja-ampat-sorong-pole-and-line-skipjack-and-yellowfin-tuna/@@view
- https://fisheries.msc.org/en/fisheries/mifv-rmi-eez-longline-yellowfin-and-bigeye-tuna/@@view
- https://fisheries.msc.org/en/fisheries/french-polynesia-albacore-and-yellowfin-longline-fishery/@@view
- https://fisheries.msc.org/en/fisheries/japanese-pole-and-line-skipjack-and-albacore-tuna-fishery/@@view
- https://fisheries.msc.org/en/fisheries/solomon-islands-skipjack-and-yellowfin-tuna-purse-seine-and-pole-and-line/@@view
- https://fisheries.msc.org/en/fisheries/solomon-islands-longline-albacore-and-yellowfin-tuna-fishery/@@view
- https://fisheries.msc.org/en/fisheries/pna-western-and-central-pacific-skipjack-and-yellowfin-unassociated-non-fad-set-tuna-purse-seine/@@viewhttps://fisheries.msc.org/en/fisheries/tri-marine-western-and-central-pacific-skipjack-and-yellowfin-tuna/@@view
- https://fisheries.msc.org/en/fisheries/fiji-albacore-and-yellowfin-tuna-longline/@@view
- https://fisheries.msc.org/en/fisheries/ishihara-marine-products-albacore-and-skipjack-pole-and-line-fishery/@@view
- https://fisheries.msc.org/en/fisheries/tropical-pacific-yellowfin-and-skipjack-free-school-purse-seine-fishery/@@view
- https://fisheries.msc.org/en/fisheries/wpsta-western-and-central-pacific-skipjack-and-yellowfin-free-school-purse-seine/@@view

While technically the 3.2 fishery specific indicators should also be harmonised with the above certified WCPFC fisheries, only approximately 2 % of the catch is taken from the high seas. The rationales and scores for 3.2 PIs are therefore weighted towards the strong domestic management regime implemented by AFMA.

8.6 Objection Procedure – delete if not applicable

To be added at Public Certification Report stage

The report shall include all written decisions arising from a 'Notice of Objection', if received and accepted by the Independent Adjudicator.

Reference(s): FCP v2.1 Annex PD

9 Appendix – Vessel list

Eligible vessels	Call Sign
D&D	FB44241Q
Straight Shooter	LFB13064
Esbjorn	O767
Scorpion II	O527
Emnicus	BX9
Calibre	RFB12913
Jordan Kate	LFB12747
Angelica	LFB12748
Volition	LFB10615
Claudarah	LFB11733
Fisco 1	LFB11375
Kaybeanna	LFB12939
Gracie P	LFB11897
Instagator	VJN3638
Mira S	VMJI
South Seas 1	N5712
Markana	O517
Samurai	O842
Miss Deb a Dell II	2314
Diamax	LFB12585
Hapuku II	LFB11985
Papanui	O735
Total	LFB11735
Rummage	O850
Katia	O499
Salvatore V	LFB5913
Sniper	LFB12035
Strikeforce	LFB12297
Assassin	LFB12748
Comanche I	O506
Sharp Shooter II	900769
Predator	509
Santa Lucia	RFB13129