Tuna Alliance Atlantic Albacore Longline fishery

MSC Fishery Assessment Report

Announcement Comment Draft Report (ACDR)

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Glossary

ACAP	Agreement on Conservation of Albatross and Petrels
ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area
ASCOBAMS	Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas
BSP	Bayesian Surplus Production
B	Biomass
B_{MSY}	Biomass at Maximum Sustainable Yield
CCSBT	Convention for the Conservation of Southern Bluefin Tuna
CI	Confidence Interval
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on Migratory Species
CPC	Contracting Parties and Cooperating non-Contracting Parties, Entities or Fishing Entities
CPUE	Catch Per Unit Effort
COC	Conservation & Management Measures Compliance Committee
DPS	Distinct Population Segment
EEZ	Exclusive Economic Zone
ETP	Endangered, Threatened or Protected species
EU	European Union
FAD	Fish Aggregating Device
F	Fishing Mortality
F_{MSY}	Fishing Mortality at Maximum Sustainable Yield
FAO	Food and Agriculture Organization of the United Nations
FCM	Fisheries Certification Methodology
GT	Gross Tonnes
HCR	Harvest Control Rules
ICCAT	International Commission for the Conservation of Atlantic Tunas
IFQ	Individual Fishing Quota
IOTC	Indian Ocean Tuna Commission
ISSF	International Sustainable Seafood Foundation
ITQ	Individual Transferable Quota
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unreported, Unregulated
Kg	Kilogram
Lb.	Pound, equivalent to roughly 2.2 kg
LL	Longline
LOA	Length Over-All
M	Million (lbs.)
MoU	Memorandum of Understanding
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation

MSY	maximum sustainable yield
nm	nautical mile
OFL	Over-Fishing Level
PI	Performance Indicator
PRI	Point of Recruitment Impairment
PVR	Proactive Vessel Register
PWG	Permanent Working Group for the Improvement of ICCAT Statistics and Conservation Measures
RFMO	Regional Fisheries Management Organisation
SBT	Southern Bluefin Tuna
SCRS	Standing Committee Research and Statistics
SCS	SCS Global Services
SG	Scoring Guidepost
SI	Scoring Issue
SSB	Spawning Stock Biomass
SSBMSY	Spawning Stock Biomass Maximum Sustainable Yield
SSF	Spawning Stock Fecundity
STACFAD	Standing Committee on Finance and Administration
SWGSM	Standing Working Group on Dialogue between Fisheries Scientists and Managers
t and mt	metric ton
TAC	Total Allowable Catch
TAI	Tuna Alliance Inc.
WCPFC	Western and Central Pacific Fisheries Commission
WWF	World Wildlife Fund

Executive Summary

This report presents the Marine Stewardship Council (MSC) assessment of the Atlantic albacore (Thunnus alalunga) longline fishery, harvested in both the North and South Atlantic, considered to be two Units of Assessment (UoA). Within the report, the UoA will be referred to more simply as the Tuna Alliance Atlantic albacore (Thunnus alalunga) longline fishery. The assessment was conducted, and the findings were prepared by SCS Global Services (SCS), an MSC-accredited, independent, third-party conformity assessment body, in accordance with the MSC Principles and Criteria for sustainable fishing. The assessment complies with the MSC Fisheries Certification Process V2.2 (released March 25, 2020) and MSC Fisheries Standard v 2.01. The fishery was assessed against the Default Assessment Tree, version 2.01.

Table 1. Unit of Certification(s) and Unit of Assessment(s)

Stock/Species (FCP V2.1 7.5.2.a)	Method of Capture (FCP V2.1 7.5.2.b)	Fishing fleet (FCP V2.1 7.5.2.c)
North Atlantic Albacore tuna stock (*Thunnus alalunga*)	Pelagic longline	19 Vessels flagged to Taiwan licensed and registered to operate in the high seas and subject to management under the ICCAT; One vessel operates in both North and South Atlantic; 12 in the South only, and 7 in the North only.
South Atlantic Albacore Tuna stock (*Thunnus alalunga*)		

Fishery Operations Overview

The Tuna Alliance Atlantic Albacore Longline fishery is a commercial fishing operation with 20 longline vessels, each with approximately 25-30 fishers onboard, landing in Port of Spain, Trinidad & Tobago; Cape Town, South Africa; Montevideo, Uruguay; and Walvis Bay, Namibia. All vessels operate within the high seas and are subject to management by ICCAT. The fleet fishes primarily for Atlantic Albacore tuna (*Thunnus alalunga*) and tuna-like species. Tuna Alliance, Inc. (TAI) is an international tuna trading company formed in 2019. TAI operates their own fleet, the Yun Mao fleet, to obtain stable tuna sources. TAI also cooperates with associate tuna longline fleets that fish in the Atlantic, Pacific, and Indian Oceans. All participating vessels in the UoA are listed on the International Seafood Sustainability Foundation (ISSF) Proactive Vessel Register (PVR).

Assessment Overview

The team selected to undertake the assessment includes four team members that collectively meet the requirements for MSC assessment teams. These are:

- Mr. Peter Trott, Team Lead
- Dr. Gerard DiNardo, Principle 1
- Ms. Jessica Melgey, Principle 2 Expert

- Mr. Andy Bodsworth, Principle 3 Expert

Summary of Findings

In this report, we provide detailed rationales for scores presented for each of the Performance Indicators (PIs) under Principle 1 (Stock status and Harvest strategy), Principle 2 (Ecosystem Impact) and Principle 3 (Governance, Policy and Management system) of the MSC Standard. No PIs failed to reach the minimum Scoring Guidepost (SG) of 60, and the average scores for the three Principles remained above SG80). The team tentatively issues 13 scoring issue-level potential conditions for seven different PIs that did not meet SG80 level. The fishery received one condition in Principle 1, eight conditions in Principle 2, and one condition in Principle 3.

In Principle 1, PI 1.2.2 received scores under SG80, these are related to harvest control rules (HCRs) and tools for southern albacore tuna stocks (UoA 2). In particular, recent evidence from the Standing Committee Research and Statistics (SCRS) of ICATT suggests uncertainty in the biological data to inform recent modelling efforts. As a result, the assessment team cannot unequivocally state that HCRs are likely to be robust to the main uncertainties and a condition was therefore issued under P1.

In Principle 2, six of the PIs have draft scores between 60-79, including primary species under outcome, information, and management, shark finning under primary and secondary species management, and Endangered, Threatened and Protected (ETP) species management strategy and information strategy. Blue shark, considered a primary main species, failed to meet SG80 under 2.1.2 and 2.1.3, due to recently published proceedings from the ICCAT that noted uncertainty in the data inputs and modeling. Furthermore, while a multi-annual conservation and management program has been proposed for North and South Atlantic blue shark (*Prionace glauca*) it has yet to specify HCRs and associated reference points. The relatively low levels of observer coverage in the fleet resulted in a draft score below SG80 for shark finning issues and ETP information. The fleet recorded the retention of five oceanic white-tip sharks (*Carcharhinus longimanus*) despite no-retention regulations in place. This resulted in a draft score <80 for 2.3.2.

In Principle 3, one of the PIs (3.2.3, scoring issue a) received scores under SG80, and therefore one proposed condition for Principle 3. In particular, the lack of evidence of Monitoring, Control and Surveillance (MCS) implementation to suggest the MCS system is operating in the way in which it is intended to at point of landing in ports, as per Taiwan regulations.

1 Report Details

1.1 Authorship and peer review details

Audit Team

Mr. Peter Trott – Independent Consultant – Lead auditor

Peter is the co-founder and Director of two international seafood consultancy companies. Firstly, FishListic, an independent sustainable seafood consultancy, offering practical and realistic solutions and strategies catering for all stakeholders ranging from fishery and farm level, governments, supply chains, and end market users. Secondly, On-Board Social Accountability International, a not-for-profit to address the abuse of workers on board fishing vessels and in aquaculture operations by enabling seafood companies to develop and implement effective social accountability management systems. Peter has over 20 years' experience in fisheries management, resource sharing, ecosystem principles, aquaculture systems, project management, seafood markets, supply chains and traceability. Prior to co-founding FishListic, Peter had been with WWF-Australia fisheries program. During the eight years at WWF, Peter led on international and domestic seafood markets, providing technical expert advice concerning imported and domestic seafood products, environmental assessments, supply chains and traceability. Peter led key strategic seafood market partnerships with retailers, brand owners and aquaculture companies. He has been involved in the Marine Stewardship Council (MSC) and with fishery certifications across the globe, including as co-client. He is a certified MSC Chain of Custody auditor, Program Manager, fishery team-member, fishery team-leader, and peer reviewer, certified SA8000 social auditor and ISO19011-2018 accredited. He has sat on the MSC Board of Trustees, and several Australian fisheries Management and Research Advisory Committees. He has attended numerous international fisheries forums as a member of Australian Government delegations. Peter was a fisheries manager with two fisheries agencies for eight years, managing sharks, squid, octopus, small pelagics, rock lobster, and scalefish. Peter holds a Bachelor of Science (Fisheries Management and Aquaculture) with an honors degree in Aquatic Sciences from Deakin University.

General Team lead requirements

Mr. Peter Trott meets the MSC Team leader qualifications in that:

- ✓ Completed training meeting requirements in Table 1 of GCRV2.4, as evidenced by the certificate of passing auditor training for the ISO course 19011 (2019).
- ✓ Relevant degree and/or equivalent experience in the fisheries sector related to tasks under responsibility of a team leader (Evidence: BS, Fisheries Management and Aquaculture with an honors degree in Aquatic Sciences from Deakin University).
- ✓ Completed of the latest MSC training modules applicable to this assessment (V2.2 Team Leader MSC modules) within the past five years (2020).
- ✓ Has undertaken 2 MSC fishery assessments or surveillance site visits in the last 5 years (2017 Full Assessment Australian Western Rock Lobster Fishery; MSC 2018 Year 2 Annual Surveillance Report

Walker Seafood Australian albacore, yellowfin tuna, and swordfish longline Fishery; 2018 Full assessment – SZLC CSFC & FZLC FSM EEZ Longline Yellowfin and Bigeye Tuna Fishery; 2019 Full assessment Tropical Pacific yellowfin and skipjack tuna free-school purse seine fishery).

- ✓ Has demonstrated experience in applying different types of interviewing and facilitation techniques, as verified by SCS records and previous audit reports.
- ✓ Is competent in the MSC Standard and current Certification Requirements, auditing techniques, and communication and stakeholder facilitation techniques, as verified by his completion of ISO 19011 auditor training (2019).
- ✓ Has affirmed he holds no conflict of interest.

Dr. Gerard DiNardo—SCS Global Services—Principle 1 expert

Dr. Gerard DiNardo has over 25 years of experience as a research fishery scientist and senior manager for NOAA Fisheries in the United States, as well as extensive knowledge, understanding, and involvement in fishery issues and processes of tuna-RFMOs and RFOs. Ensuring sustainable development and management of fisheries, including the identification of research and plans of action to support effective management decision making has been the focus throughout his career, and with a strong background and understanding of international fisheries and MSC. He holds an MSc from Long Island University, C.W. Post Center and a Ph.D. from University of Maryland, where his dissertation topic was FISHMAP: An Expert System for Sampling Fish Populations.

Gerard was appointed as the Fisheries Resources Division Director of the Southwest Fisheries Science Center in San Diego, CA from 2015 to 2019. Previously, he held several positions at NMFS, including Supervisor of the Stock Assessment Program in the Fisheries Research and Monitoring Division at the Pacific Islands Fisheries Science Center. Dr. DiNardo was multiple publications related to the assessment of pelagic species, including tuna. He's held positions as Co-Chair of the Joint PICES/ISC Working Group on Ocean Conditions and the Distribution and Productivity of Highly Migratory Fish for the North Pacific Marine Science Organization, standing member of the NMFS National Stock Assessment Methods Steering Committee, science expert on the U.S.A. Delegation to the Western Central Pacific Fisheries Commission and Chair of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC).

General Team requirements

Dr. Gerard DiNardo's experience satisfies the MSC requirements for a Team Member as described in PC2 (FCP v2.2):

- ✓ With relevant degree (Ph.D., University of Maryland) and over 5 years of research experience in management or research experience in a marine conservation biology, fisheries, natural resources or environmental management position.
- ✓ Has passed the MSC compulsory training modules for Team Members within the last 5 years (2019).
- ✓ Affirms they have no conflict of interest in conducting this assessment.

Principle 1

- ✓ Dr. Gerard DiNardo meets the qualifications for "Fish stock assessment" with a) 3 years or more of experience of applying relevant stock assessment techniques being used by the fishery under assessment, or b) Primary authorship of 2 peer-reviewed stock assessments of a type used by the fishery under assessment. This is evidenced by his experience as a stock assessment scientist and leader of the Stock Assessment Group at the NOAA Fisheries Pacific Islands Fishery Science Center (2006-2015). Dr. DiNardo used production models to assess the status of North Pacific swordfish in 2014 and 2009, blue marlin in 2013, striped marlin in 2005 (http://isc.fra.go.jp/index.html). He was also an author on numerous analyses used as input to the assessments (Wang et al. 2007; Su et al. 2009, Piner et al. 2011 – this can be found on the ISC website). From 2010-2017, Gerard DiNardo chaired the ISC, and a major aspect of his duties was to ensure that all documents published by the ISC were considered best available science, particularly published stock assessments. During his tenor in this role novel blue and shortfin mako shark assessments were completed employing a production modeling platform. This experience is verified on his CV.
- ✓ Dr. Gerard DiNardo meets the qualifications for "Fish stock biology/ecology" with 3 years or more of experience working with the biology and population dynamics of the target species or species with similar biology. This is evidenced by his research and publications on post release mortality and development of the HI longline observer program. Dr. DiNardo also Chaired the International Scientific Committee (2010-2017), an RFO tasked with completing stock assessments for the WCPFC on highly migratory stocks in the North Pacific Ocean. This is verified on his CV.

Ms. Jessica Melgey – SCS Global Services – Principle 2 expert

Ms. Melgey has a Bachelor of Science in Biology, an M.S. in Fisheries Science, and more than twelve years of experience as a professional in fisheries science, policy, and management. She is widely experienced in the impacts of fisheries on aquatic ecosystems including to habitat, endangered and threatened species, and non-target bycatch. She has spent time in both the public and private sectors, and is familiar with permitting, policy, and regulatory issues in large- and small-scale fisheries. As a fisheries observer and observer data editor and later as a fishery analyst for the New England Fishery Management Council, she gained familiarity with a wide range of vessel and gear types and understands much of the inner workings of commercial fisheries. She spent time aboard commercial vessels as an observer, a contract survey scientist, and a graduate student, and maintains a strong interest in collaborative research and fisheries sustainability.

General Team requirements

Ms. Jessica Melgey's experience satisfies the MSC requirements for a Team Member as described in PC2 (FCP v2.2):

- ✓ With relevant degree (Bachelor of Science in Biology, Boston College; Master of Science in Living Marine Resources Science and Management, University of Massachusetts School for Marine Science and Technology) and over 5 years of research experience in management or research experience in a marine conservation biology, fisheries, natural resources or environmental management position.

- ✓ Has passed the MSC compulsory training modules for Team Members within the last 5 years (2022).
- ✓ Affirms they have no conflict of interest in conducting this assessment.

Principle 2

- ✓ Jessica Melgey meets the qualifications for "Fishing impacts on aquatic ecosystems" with 3 years or more of experience in research into, policy analysis for, or management of, the impact of fisheries on aquatic ecosystems including at least two of the following topics: i. Bycatch. ii. Endangered, threatened, or protected (ETP) species. iii. Habitats. iv. Ecosystem interactions. As evidenced by her more than 12 years of professional experience in fisheries including conducting numerous impacts analyses for threatened and endangered species and essential fish habitat. This experience is verified by her CV.

Mr. Andy Bodsworth – Cobalt Marine Resource Management Pty Ltd – Principle 3 Expert

Mr. Andy Bodsworth has extensive fisheries management experience; principally with the Australian Fisheries Management Authority (AFMA) managing tropical, sub-tropical and temperate commercial fisheries across a wide range of gear types. More recently he has worked as Principal Consultant and CEO of sustainable fisheries consulting firm Cobalt Marine Resource Management Pty Ltd. Andy holds a Graduate Certificate in Environmental Management from the University of Queensland, with a focus on fisheries policy, economics and management.

Since 1999, Andy has worked extensively with small and large fishing businesses, federal and state government agencies, environmental NGOs, and other stakeholders to develop, implement and review best practice fisheries management and marine conservation policies and strategies. He has managed purse seine and mid-water trawl fisheries for schooling small pelagic species, including skipjack tuna; and purse seine and pelagic longline fisheries for tropical and temperate tuna and billfish species subject to international management agreements and treaties. He has also worked extensively with Regional Fisheries Management Organisation's (RFMO's) in Australia's area of interest.

As program manager for Australia's larger northern fisheries, including traditional fisheries in Torres Strait managed under treaty with Papua New Guinea, he has worked closely with traditional inhabitant fishers over many years to enable sustainable fishing businesses in these remote areas.

Mr. Bodsworth's principal expertise lies in the evaluation of fisheries management performance against contemporary sustainability guidelines. He was the fisheries management representative on a multi-disciplinary team that developed Australia's initial Harvest Strategy Policy Framework and supporting operational guidelines. He also has extensive experience with development of fishery specific harvest strategies to improve economic, environmental and social performance for large and small commercial fisheries. He has a particular interest and expertise in ESD based risk assessment and using this to guide development of fishery improvement strategies.

Andy has managed several larger scale projects to formally evaluate ESD performance for higher value commercial fisheries, as well as high profile marine conservation and recovery strategies such as Australia's National Plan of Action for the Conservation and Management of Sharks (NPOA Sharks). He has worked extensively with Australian government fisheries and environment agencies, fishing industry peak bodies and businesses, and conservation NGO's such as WWF Australia over many years.

General Team requirements

Andy Bodsworth experience satisfies the MSC requirements for a Team Member as described in PC2 (FCP v2.2):

- ✓ With relevant degree Graduate degree in Environmental Management from University of Queensland and over 5-years work experience with fisheries management consulting
- ✓ Has passed the MSC compulsory training modules for Team Members within the last 5 years (June 6, 2019)
- ✓ Affirms he has no conflict of interest in conducting this assessment.
- ✓ Team member will be remote for site visit (as per COVID derogation)

Principle 3

- ✓ Andrew Bodsworth meets the qualifications for 'Fishery management and operations 'with 3 years or more of experience as a practising fishery manager and/or fishery/policy analyst/consultant. This is evidenced by over twenty years of fishery management experience with small and large fishing businesses, federal and state government agencies, environmental non-governmental organizations (NGOs), and other stakeholders to develop, implement and review best practice fisheries management and marine conservation policies and strategies. This is verified on his CV.
- ✓ Mr. Bodsworth has current knowledge of Taiwan and its distant water fisheries sector, particularly in a tuna longline context. This stems from his prior experience as Australia's Southern Bluefin Tuna Manager, including in-country experience, and regular liaison with Taiwan's government fisheries agencies and officials. He is also currently working as a P3 assessor on an SCS Global MSC assessment for a similar Taiwanese flagged longline fishery for Atlantic Albacore; as well as other assessments involving Taiwanese flagged vessels in the WCPO. These assignments are verified on his C.V.

Peer Reviewers

Peer reviewer information to be completed at the Public Comment Draft Report Stage.

1.2 Version details

Table 2. Fisheries program documents versions

Document	Version number
MSC Fisheries Certification Process	**Version 2.2**
MSC Fisheries Standard	**Version 2.01**
MSC General Certification Requirements	**Version 2.3**
MSC Reporting Template	**Version 1.2**

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

2.1 Unit(s) of Assessment (UoA) and Unit(s) of Certification

2.1.1 Unit(s) of Assessment

The Unit of Assessment (UoA) includes North and South Atlantic albacore caught by 19 vessels with a holding capacity varying from 268 to 599 gross tonnes (GT) flagged to Taiwan, using pelagic longline gear, and fishing within the high seas and ICCAT management area. This assessment includes two UoAs: UoA 1 and UoA 2 share the same gear type/operations and management system, and only differ in regards to Principle 1 stocks that are targeted and the areas with the ICCAT management zone in which they operate. For this reason, P3 is scored jointly for the two UoA's, P2 is scored differently depending on the UoA, and P1 species of UoA1 and UoA2 are not scored a second time as primary species. A target species that is certified under P1 and has obtained an overall score >80 for P1, will have already been assessed under a higher standard of performance than that of main retained/primary under P2, thus it is expected to obtain a score >80 for the relevant Performance Indicators under P2. If in a subsequent assessment one of the target P1 species fails and is no longer considered as certified, it will then be scored under P2.

The scope of the assessment is limited to vessels that are part of the client group (for a list of the vessels See Appendix in Section 6.11). There may be some vessels that move out and in of the client group; these are considered as 'other eligible fishers' as long as they share the same characteristics (fishing gear/operations, management system, and area of operation). The current assessment is based on the observer data of the vessels currently listed as part of the client group, which is considered representative of other vessels with the same characteristics that may join the client group. Taking a precautionary approach, when adding new vessels to the client group, following Annex PE, SCS will conduct a gap analysis to confirm all the assessment tree components are the same for the existing fishery certificate and confirm that these vessels are within scope of the MSC Fisheries Standard, (i.e., verify that no vessels have been convicted of shark finning violation or conviction for forced or child labour in the last two years).

This fishery has been found to meet scope requirements (FCP v2.2 7.4) for MSC fishery assessments as it

- Does not operate under a controversial unilateral exemption to an international agreement, use destructive fishing practices, does not target amphibians, birds, reptiles or mammals and is not overwhelmed by the dispute (FCP 7.4.2.1, 7.4.2.2, 7.4.3, 7.4.5).
- The fishery does not include an entity successfully prosecuted for shark finning within the last 2-years (FCP 7.4.2.10).
- There are mechanisms for resolving disputes in place (FCP 7.4.5.1), and the fishery has not previously failed assessment or had a certificate withdrawn.
- Is not an enhanced fishery, is not based on an introduced species and does not represent an inseparable or practically inseparable species (FCP 7.5.1, 7.5.2, 7.5.8-13).

- Does overlap with other MSC certified or applicant fisheries (7.5.14) and scores have been harmonised following FCP Annex PB. For a list of overlapping fisheries see Section 6.8.
- Does not include an entity successfully prosecuted in respect of violation of a forced or child labour law within the last 2 years (FCP 7.4.2.4).
- The Unit of Assessment, the Unit of Certification, and eligible fishers have been clearly defined, traceability risks characterized, and the client has provided a clear indication of their position relative to certificate sharing (FCP 7.5).

Table 3. Unit(s) of Assessment (UoA).[1]

UoA 1	**Description**
Species	Albacore tuna (*Thunnus alalunga*)
Stock	North Atlantic
Fishing gear type(s) and, if relevant, vessel type(s)	Pelagic longline
Client group	Tuna Alliance, Inc.
Other eligible fishers	Vessels that target the same species and meet the characteristics described in the UoA, but are not currently part of the client group are considered as 'other eligible fishers'. See certificate sharing mechanism in Section 6.10.
Geographical area	No. Atlantic Ocean – high seas
UoA 2	**Description**
Species	Albacore tuna (*Thunnus alalunga*)
Stock	South Atlantic
Fishing gear type(s) and, if relevant, vessel type(s)	Pelagic longline
Client group	Tuna Alliance, Inc.
Other eligible fishers	Vessels that target the same species and meet the characteristics described in the UoA but are not currently part of the client group are considered as 'other eligible fishers'. See certificate sharing mechanism in Section 6.10.
Geographical area	So. Atlantic Ocean – high seas

[1] Vessel MAAN FWU NO.168 has been removed from the UoA due to an incident suggesting evidence of shark finning as per MSC interpretation log dated June 29, 2021 (linked here). Subsequently, this vessel is no longer an eligible fisher for this assessment.

2.1.2 Unit(s) of Certification

Table 4. Unit(s) of Certification (UoC)

UoC 1	Description
Species	Albacore tuna (*Thunnus alalunga*)
Stock	North Atlantic
Fishing gear type(s) and, if relevant, vessel type(s)	Pelagic longline
Client group	Tuna Alliance, Inc. – see specified vessel list listed in Section 6.11.
Geographical area	No. Atlantic Ocean – high seas
UoC 2	**Description**
Species	Albacore tuna (*Thunnus alalunga*)
Stock	South Atlantic
Fishing gear type(s) and, if relevant, vessel type(s)	Pelagic longline
Client group	Tuna Alliance, Inc. – see specified vessel list listed in Section 6.11.
Geographical area	So. Atlantic Ocean – high seas

2.1.3 Scope of Assessment in Relation to Enhanced Fisheries or Introduced Fisheries –

There is no evidence of enhancement or of introduced species in this fishery.

2.2 Assessment results overview

2.2.1 Determination, formal conclusion and agreement

The determination of the fishery is drafted at the final report and completed at the PCR.

2.2.2 Principle level scores

To be drafted at Client and Peer Review Draft Report stage.

Table 5. Principle level scores

Principle	No. Atlantic UoA 1	So. Atlantic UoA 2
Principle 1 – Target species	>80	>80
Principle 2 – Ecosystem impacts	>80	>80
Principle 3 – Management system	>80	>80

2.2.3 Summary of conditions

To be drafted at Client and Peer Review Draft Report stage.

2.2.4 Recommendations

To be drafted at Client and Peer Review Draft Report stage.

3. Traceability and eligibility

3.1 Eligibility date

The target eligibility date will be the date of the publication of the PCDR (TBD).

3.2 Traceability within the fishery

Description of Tracking, Tracing and Segregation Systems

The following traceability evaluation is for the UoC/UoA covering 20 Taiwanese flagged pelagic longline vessels targeting albacore tuna and operating within the high seas until the management of ICCAT.

Below we've listed the main stages of the supply chain within the UoC fishery and the relevant tracking, tracing and segregation systems at each step:

1. **Capture of product:** Pelagic longline – Single Gear Type
2. **On-board processing:** NIL – Frozen whole Round on-board
3. **Product unloading:** Direct unload in port; fish are unloaded and landed directly to the port
4. **Product transport:** Fish are loaded into the refrigerated container and then shipped to the buyer via the container ship
5. **Product storage:** Refrigerated container
6. **Product sale and first change of ownership:** Products are landed in port(s) directly, ownership changes from the vessel owner to Tuna Alliance Inc when the products are unloaded at port and placed into the refrigerated container, ownership will be changed to the buyer when the cargo being delivered at the destination

The following management systems are in place to ensure segregation of certified vs. non-certified product at a high level.

1. The main catch of the participating vessels is Albacore under normal circumstances. Additional species including Bigeye, Yellowfin, Skipjack, and others are identified as "miscellaneous/loose" fish. When hauling line, all catch will be frozen in the freezing room and then moved to the hatches for storage, at which point Albacore will be separated from the miscellaneous/loose fish by hatch. Strict guidelines will be provided to crew to ensure Albacore is not mixed with any other catch.
2. When offloading at port, vessels will hang flags stating "TUNA ALLIANCE INC MSC" on the containers, vessel, and port side to show that MSC certified cargo is being handled. Certified cargo will be handled separately from all other catch, and clear guidelines and training will be provided to the port supervisors/agents and vessel owners, captains, officers, and crews to ensure adherence to the MSC cargo handling procedure.
3. If different batches of fish from multiple vessels are being offloaded at the same time into the same container, certified and non-certified catch will be separated by using nets when storing catch in the container, and that container will be stored only with MSC-certified cargo, but combine the cargoes from multiple vessels and loaded into one container seldom happened ; We will always allocate the full of container to be loaded by MSC cargo and only from the same vessel.

Table 6. Traceability within the fishery

Factor	Description
Will the fishery use gears 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.	The UoA only deploys pelagic longline sets. There is no risk that other commercial fishing gear could be used within the fishery.
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.	All UoA and Taiwanese vessels operating on the high seas within the ICCAT convention area. All vessels carry Vessel Monitoring Systems and their movements are monitored by Taiwan Fisheries Agency.
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 If Yes, please describe how any risks are mitigated.	Never. First, as mentioned above, during fishing, if fish is caught outside UoC, then the whole fishing trip will be disqualified as non-MSC raw material. Vessel crews will tie tags on those non-MSC species fish (bycatch…etc.) because the quantity is very limited, mostly all size Albacore which is the target species.
Does transshipment occur within the fishery? If Yes, please describe: - If transshipment takes place at-sea, in port, or both; - If the transshipment vessel may handle product from outside the UoC; - How any risks are mitigated.	No high-seas transshipment. Vessels always call port for unloading once fully loaded, very rarely have chances to transship cargoes onto a carrier at high sea and normally Tuna Alliance will take the lead on arranging the carrier.
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 other risks.

3.3 Eligibility to enter further chains of custody

To be drafted at Client and Peer Review Draft Report stage.

3.4 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to Enter Further Chains of Custody

4 Scoring

4.1 Summary of Performance Indicator level scores

Table 7. Summary of Performance Indicator Scores and Associated Weights Used to Calculate Principle Scores.

P	Component	Wt	Performance Indicator (PI)		Wt	Score	
						N Atl.	S. Atl.
One	Outcome	0.333	1.1.1	Stock status	1.0	>80	>80
	Management	0.667	1.2.1	Harvest strategy	0.25	>80	>80
			1.2.2	Harvest control rules & tools	0.25	>80	60-79
			1.2.3	Information & monitoring	0.25	>80	>80
			1.2.4	Assessment of stock status	0.25	>80	>80
Two	Primary species	0.2	2.1.1	Outcome	0.333	60-79	60-79
			2.1.2	Management strategy	0.333	60-79	60-79
			2.1.3	Information/Monitoring	0.333	60-79	60-79
	Secondary species	0.2	2.2.1	Outcome	0.333	>80	>80
			2.2.2	Management strategy	0.333	60-79	60-79
			2.2.3	Information/Monitoring	0.333	>80	>80
	ETP species	0.2	2.3.1	Outcome	0.333	>80	>80
			2.3.2	Management strategy	0.333	60-79	60-79
			2.3.3	Information strategy	0.333	60-79	60-79
	Habitats	0.2	2.4.1	Outcome	0.333	>80	>80
			2.4.2	Management strategy	0.333	>80	>80
			2.4.3	Information	0.333	>80	>80
	Ecosystem	0.2	2.5.1	Outcome	0.333	>80	>80
			2.5.2	Management	0.333	>80	>80
			2.5.3	Information	0.333	>80	>80
Three	Governance and policy	0.5	3.1.1	Legal &/or customary framework	0.333	>80	>80
			3.1.2	Consultation, roles & responsibilities	0.333	>80	>80
			3.1.3	Long term objectives	0.333	>80	>80
	Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.25	>80	>80
			3.2.2	Decision making processes	0.25	>80	>80
			3.2.3	Compliance & enforcement	0.25	60-79	60-79
			3.2.4	Monitoring & management performance evaluation	0.25	>80	>80

Table 8. Final Principle Scores

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	>80
Principle 2 – Ecosystem	>80
Principle 3 – Management System	>80

4.2 Principle 1

4.2.1 Principle 1 background

4.2.1.1 Life History Information (Albacore Tuna)

Taxonomic classification

Class: Actinopterigii

Order: Scrombriformes

Family: Scombridae

Genus: *Thunnus*

Species: *alalunga*

Biology

Albacore tuna (*Thunnus alalunga*) are found in temperate and tropical waters across the globe in the epipelagic and mesopelagic zones. They are opportunistic pelagic predators that eat a variety of foods, including fish, crustaceans, and cephalopods. They are unique among tuna in that their primary food source in some regions is cephalopods, with fish making up a much smaller portion of their diet. The thermal preference has been established in the 10-20°C temperature range, although temperatures outside that range can be tolerated for short periods (Graham and Dickinson 1981, Laurs and Lynn 1991). Depth distribution has been observed down to 450 m in the Pacific Ocean by Bard et al. (1999). Other authors have found that depth distribution in the Pacific ranges between 0-380 m (Bertrand et al. 2002).

Behaviour

In the Pacific Ocean, similar sized albacore travel together in school groups that can be several miles wide. The schools are generally not as large or as dense as those of some other tuna species such as yellowfin (*Thunnus albacares*) or skipjack (*Katsuwonus pelamis*; Foreman 1980, CA DFG 2001). At the onset of the migration, (during the spring and summer months in the western Pacific Ocean), the young albacore form relatively small, loose, and broadly scattered groups. As the season progresses, the groups become more compact and contain greater numbers of schools. The more sedentary, older albacore typically form smaller, more compact, and independent groups. Although occasionally albacore may appear with some other tuna species, mixed species aggregations are not as frequent as they are among tropical tunas. Moreover, although some schools may be found in the vicinity of floating objects (CA DFG 2001), their association with fish aggregating devices (FADs) is not as strong as in tropical tunas.

Distribution and Stock Structure

Albacore is a temperate tuna widely distributed globally into six stocks: North Atlantic and South Atlantic stocks, North Pacific and South Pacific stocks, Indian Ocean stock, Mediterranean stock (Figure 1). However, various sub populations of albacore may exist in the North Atlantic and Mediterranean, and there is likely intermingling of Indian Ocean and South Atlantic immature albacore; all of which needs further research (ICCAT 2018). Based on biological information in the Atlantic Ocean, the northern and southern Atlantic stocks are separated at 5°N (Figure 2).

Albacore stocks in the North Atlantic, North Pacific and the Mediterranean are strongly influenced by environmental conditions affecting their distribution and fishing grounds, as well as productivity levels and potential MSY of the stocks (ICCAT 2018).

Juvenile and adult albacore generally aggregate in the central North Atlantic. Concentration of albacore occurs in the month of May near the Azores, followed by general movement to more northern waters to Ireland and Bay of Biscay by June or July. The spawning migration occurs with summer off Venezuela and the Sargasso Sea in the western North Atlantic, and in early autumn the return migration initiates to central Atlantic via southern Portugal, Canary Islands, and the Azores. The Taiwanese longline fleet is the major albacore fleet operating in the Atlantic and targets albacore and other species throughout the year (Domingo et al. 2014).

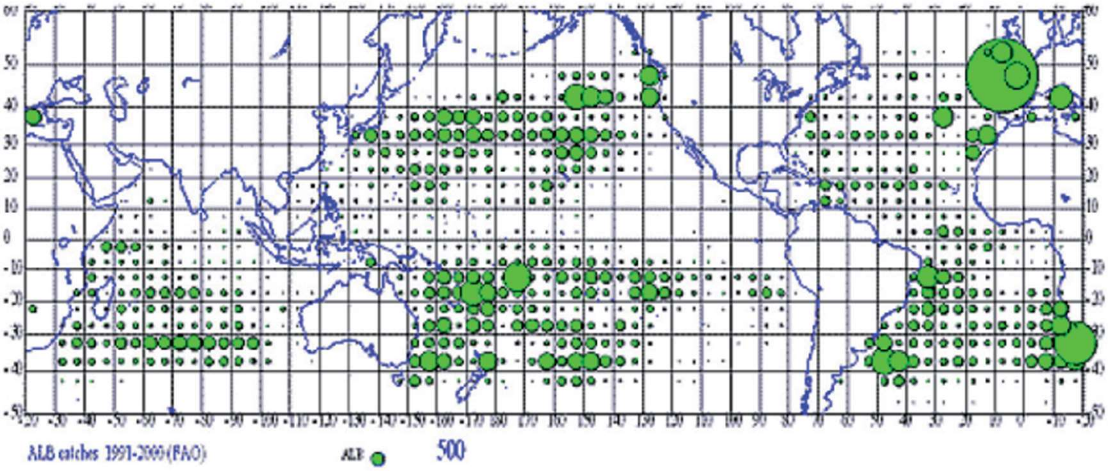


Figure 1. Geographical distribution of albacore from reported catches between 1991-2000 (from ICCAT 2006-2016).

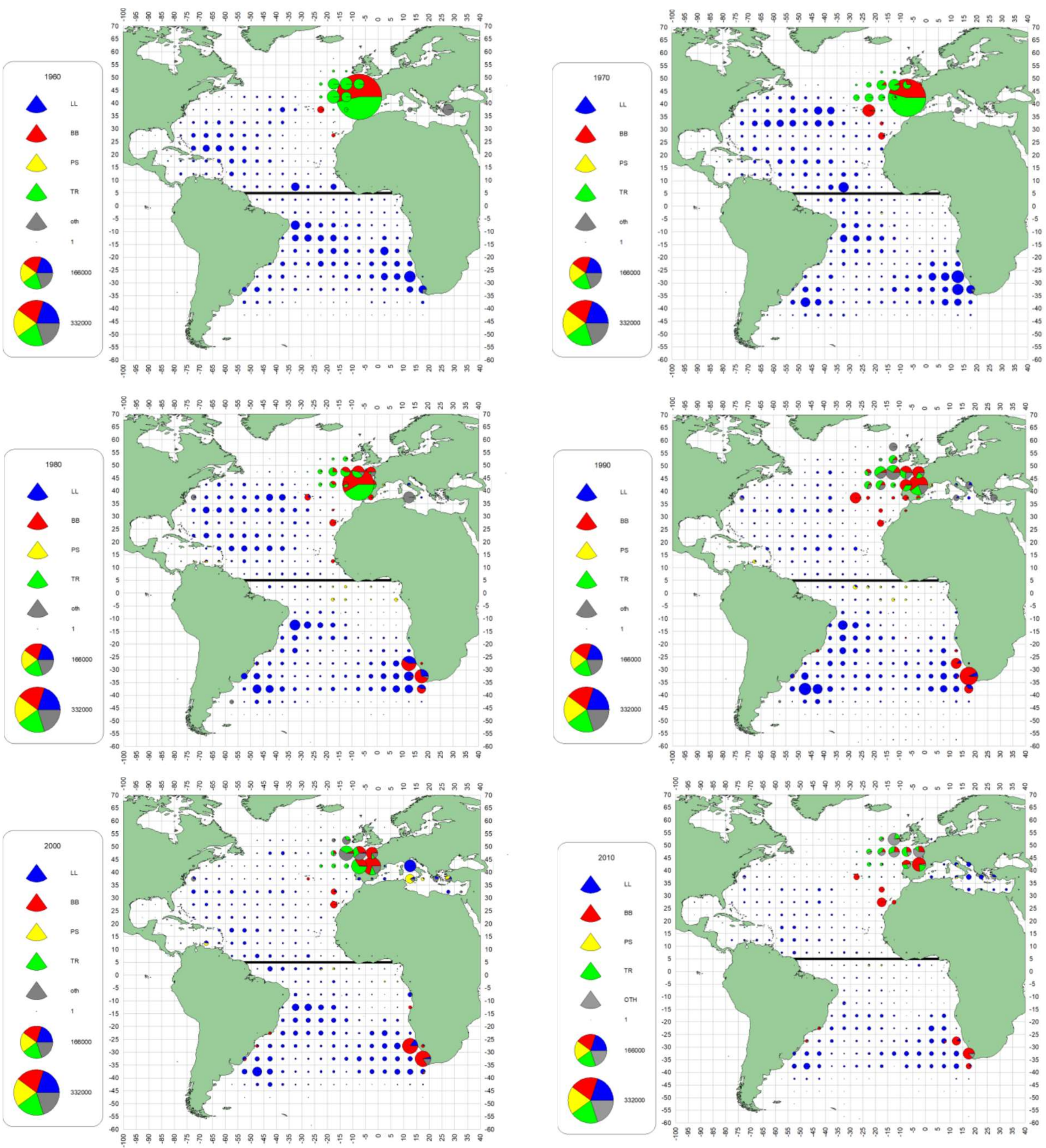


Figure 2. Geographic distribution of albacore accumulated catch by major gears and decade (1960-2016); A (top left): (1960-1969), B (top right): (1970-1979), C (middle left): (1980-1989), D(middle right): (1990-1999), E (bottom left): (2000-2009), F (bottom right): (2010-2017). Gear types: LL - longline, BB – bait-boat, PS – purse seine, TR – trolling, oth – other gear. Plots are scaled to the maximum catch observed from 1960 to 2017 (last decade only covers 7 years). Solid black horizontal line delineates 5°N.

Growth and Natural Mortality

The expected life-span for albacore is around 15 years. Albacore exhibit sexually dimorphic growth after they reach maturity with males attaining a larger size and older age than females. A re-examination of the age and growth data compiled by Wells et al. (2013) showed that for those individuals in which sex was recorded, there was clear evidence of sexually dimorphic growth between males and females (Xu et al. 2014).

Reproduction and Recruitment

Albacore are batch spawners, shedding eggs directly into the sea during discrete spawning events. Spawning frequency is estimated to be 1.7 days in the western Pacific Ocean (Chen et al. 2010), and batch fecundity ranges between 0.17 and 2.6 million eggs (Ueyanagi 1957, Otsu and Uchida 1959, Chen et al. 2010). Female albacore mature at lengths ranging from 83 cm fork length (FL) in the western Pacific Ocean (Chen et al. 2010) to 90 cm FL in the central Pacific Ocean), and 93 cm FL north of Hawaii (Otsu and Uchida 1959).

In general, there is a lack of studies oNo. Atlantic albacore sexual maturity. Lam Hoai (1970) estimated that first sexual maturity is reached at 75-85 cm FL, while Hayasi et al. (1972) assume sexual maturity occurs at 85 cm (around 13 kg). At present, for north and South Atlantic albacore it is assumed that 50% of the fish are mature at 90 cm or age 5 (Bard 1981), and at 62 cm for Mediterranean albacore (Arena et al. 1980). While albacore is a temperate species, spawning in the Atlantic occurs in tropical waters.

Knowledge of the early life stages in tunas is scarce. It is assumed that the larval period is short. The beginning of the juvenile period has been established arbitrarily based on sizes escaping from plankton nets, around 2 cm (Bard 1981).

4.2.1.2 Stock Status—North Atlantic Albacore Stock

Fishery Indicators

The northern stock is exploited by surface fisheries targeting mainly immature and sub-adult fish (50 cm to 90 cm FL) and longline fisheries targeting immature and adult albacore (60 cm to 130 cm FL). EU fleets comprise the majority of surface fisheries which operate seasonally, while the Taiwan fleet that operates year-round constitutes the main longline fishery. The relative contribution of different fleets to the total catch of North Atlantic albacore has varied over time, resulting in differential effects on the age structure of the stock. Taiwan fishing effort decreased in the late 1980s resulting from a shift in fishery target to tropical tuna, and effort has remained at this lower level to the present. Since the 1980s, the fishing area for albacore tuna in the North Atlantic Ocean has contracted for both surface and longline fisheries (see Figure 3).

Total reported landings steadily increased from the 1950s, peaking at approximately 65,000 t by 1963, and declining thereafter largely due to a reduction of fishing effort by traditional surface fisheries (troll and bait-boat) and longline fisheries (Figure 4). Since 2009 catch has been increasing mainly due to increased effort and catch by European trawl and bait-boat fisheries, as well as similar fisheries flagged to Japan and Taiwan.

The total reported catch in 2018 was 29,691 t, below the established TAC of 33,600 t, and the preliminary total reported catch in 2019 was 34,772 t, above the TAC of 33,600 t. Catch in the last five years has remained around 30,000 t, fluctuating around the TAC in the last few years. Since 2016 surface fisheries contributed to approximately 80% of the total catch while approximately 20% of the catch was attributed to longline fisheries. As noted previously, Japan and Taiwan have reduced fishing effort directed at albacore and in Japanese fisheries albacore are caught mainly as bycatch.

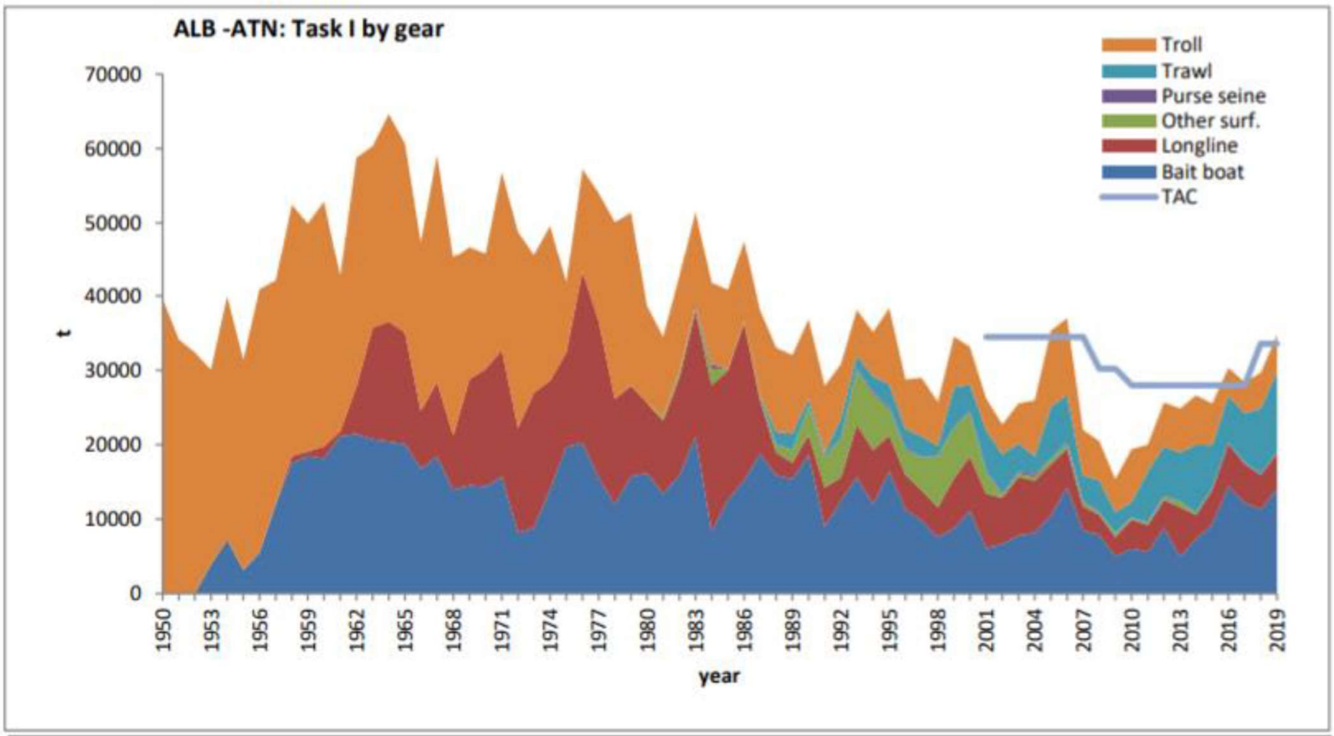


Figure 3. Total albacore catches reported to ICCAT (Task I) by gear for the No. Atlantic stock including TAC's (red line). (from ICCAT 2019).

Four longline and one bait-boat CPUE indices were used in the production model to determine stock status: 1) the weight index from the Taiwan LL (1981-2018), 2) the Japanese longline index (1976-2018) excluding the 2013 observation, 3) the Venezuela longline index (1991-2017) excluding 2018 observation, 4) the USA longline index (1987- 2018), and 5) the Spanish bait-boat index (1981-2018). The Standing Committee Research and Statistics (SCRS) lacked a basis for deciding which CPUE series best represented abundance and assumed that the different series reflected local abundances available to fleets operating in different areas and collectively represented the North Atlantic albacore population trend. On this basis, the SCRS agreed to use all 5 CPUEs in the base case scenario, with equal weighting. While all 5 CPUE time series exhibited significant variability, particularly in the later years, the series showed an overall increasing trend towards the end of the time series (Figure 4).

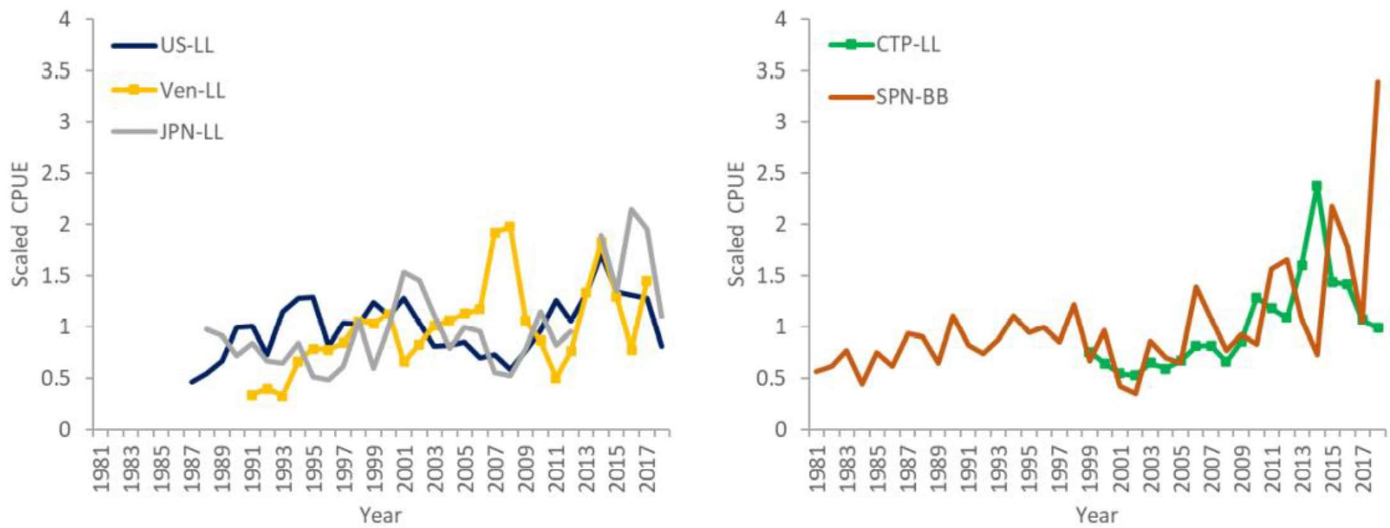


Figure 4. Standardized catch rate time series used in the 2020 North Atlantic albacore stock assessment. The surface fishery series (BB) is mostly comprised of juvenile fish, and the longline fishery (LL) series comprised mostly of adult fish. CTP-LL is the Taiwan longline index (1981-2018), JPN-LL the Japanese longline index (1976-2018) excluding the 2013 observation, Ven-LL the Venezuela longline index (1991-2017) excluding 2018 observation, US-LL the USA longline index (1987- 2018), and SPN-BB the Spanish bait-boat index (1981-2018) (from ICCAT 2020).

Status Determination

ICCAT regularly assess the status of North Atlantic albacore tuna and the latest assessment was conducted in 2020 using data until 2018 and the same modeling procedures as in 2016 (ICCAT 2020). The 2016 stock assessment used a production model to assess stock status based on results of modeling testing conducted as part of the 2013 stock assessment (ICCAT 2016). Several model formulations (Multifan-CL, Stock Synthesis, VPA and ASPIC) with varying degrees of complexity were tested, and results showed that although the range of estimated management benchmarks was relatively wide, most models resulted in similar stock determinations. On this basis the SCRS suggested that future assessment updates could be conducted using simpler models (e.g., production models), despite the caveats associated with production models. Stock status determinations in 2020 were initially conducted using two production models formulations (ASPIC and JABBA), and all results and conclusions based on converged model runs. Model diagnostics, including likelihood profiles, residuals of fit, and retrospective analyses, as well as the model's likelihood to accurately represent uncertainty, were used to evaluate the utility of each model. Retrospective analysis was limited to the last 5 years of data and the pattern was minimal for the first 3 years of data, whereas removing 4 years yielded a result like the 2016 assessment, conducted 4 years ago. Additionally, alternative indices that the SCRS considered adequate in their formulation were included as a sensitivity run in the 2020 albacore assessment. Such indices include JPN-LL1 (1959-1969), JPN-LL3 (1976-2018), JPN-LL core (1976-2018), Brazil longline (BRA-LL, 2002-2018) and South Africa bait-boat (ZAF-BB, 2003-2018).

The SCRS concluded that JABBA and ASPIC results were consistent and similar in terms of central tendency, but that JABBA enables to capture more of the uncertainty by accounting for both observation and process error. It was recommended that stock status and provided management advice be based on the JABBA base case model results only, including the projections, and estimated Kobe probability matrices.

The results of the JABBA base case assessment model for North Atlantic albacore are shown in Table 13 and Figure 5. Results indicate a decreasing biomass trend between the 1930s and the 1990s and an increasing trend since then. The stock was overfished with B below BMSY between the 1970s and 2000s, and the stock has recovered to levels well above BMSY (Figure 5). Fishing mortality increased between the 1930s and 1980s, declining thereafter. The stock was experiencing overfishing from the 1960s to early 2000s; since then fishing mortality has been well below FMSY (Figure 5). The 2020 North Atlantic albacore stock assessment estimated MSY at 36,816 t (80% CI (35,761 - 38,039) and B_{MSY} as 392,556 t (349,403 - 405,097). The results show B_{2019}/B_{MSY} is 1.32 (80% CI 1.13-1.51) and F_{2019}/F_{MSY} was 0.62 (0.52-0.74) (Table 9). Based on the results of the 2020 stock assessment, North Atlantic albacore tuna are not overfished and are not subject to overfishing.

The uncertainty around the current stock status has a clear shape determined by the strong correlation between parameters estimated by the production model (Figure 6). The probability of the stock currently being in the green area of the Kobe plot (not overfished and not undergoing overfishing), F<FMSY and B>BMSY is 98.4% while the probability of being in the yellow area (overfished, B<BMSY) is 1.66%. The probability of being in the red area (overfished and undergoing overfishing, F>FMSY and B<BMSY) is 0%.

Table 9. Summary of estimated management quantities (median with 80% confidence intervals) for Atlantic albacore.

Atlantic Albacore Summary		
	North Atlantic	South Atlantic
Maximum Sustainable Yield	36,816 t (35,761-38,039)[1]	27,264 t (23,734-31,567)[2]
Current (2019) Yield	34,772 t	15,640 t
Yield in last year of assessment (2018)	29,691 t	17,098 t
B_{2019}[3]	508,074 t (425,273 - 602,157)[1]	
B_{MSY}	392,556 t (349,403 -405,097)[1]	124,453 t (79,611-223,424)[2]
F_{MSY}	0.093 (0.091-0.108)[1]	0.219 (0.116-0.356)[2]
B_{2019}/B_{MSY}	1.32 (1.13 - 1.51)[4]	1.58 (1.14 - 2.05)[5]
B_{2019}/B_{LIM}[7]	3.3 (2.83-3.78)[1]	
$F_{CURRENT}/F_{MSY}$	0.62 (0.52-0.74) [8]	0.40 (0.28-0.59) [9]
Stock Status	Overfished: NO	Overfished: NO
	Overfishing: NO	Overfishing: NO

Atlantic Albacore Summary		
	North Atlantic	South Atlantic
Management measures in effect:	[Rec. 98-08]: Limit number of vessels to 1993-1995 average. [Rec. 17-04]: TAC of 33,600 t for 2018-2020, according to interim HCR. Management objective is to keep the stock in (or rebuild it to) the green area of the Kobe plot with 60% probability, while maximizing catch and reducing variability of TAC.	[Rec. 16-07]: TAC of 24,000 t for 2017-2020
Recommended TAC 2021-2023 following HCR	37,801 t	

1 Median and 80% CI for the base case.
2 Median and 95% CI for the base case.
3 The assessment model estimates the biomass at the beginning of the year following the last year of data, this is $B_{current}$ as referred in Rec. [17-04].
4 B_{2019}/B_{MSY} Median and 80% CI for the base case.
5 B_{2018}/B_{MSY} Median and 95% CI for the base case.
7 The interim B_{LIM} is $0.4*B_{MSY}$.
8 F_{2018}/F_{MSY} Median and 80% CI for the base case
9 F_{2018}/F_{MSY} Median and 95% CI for the base case

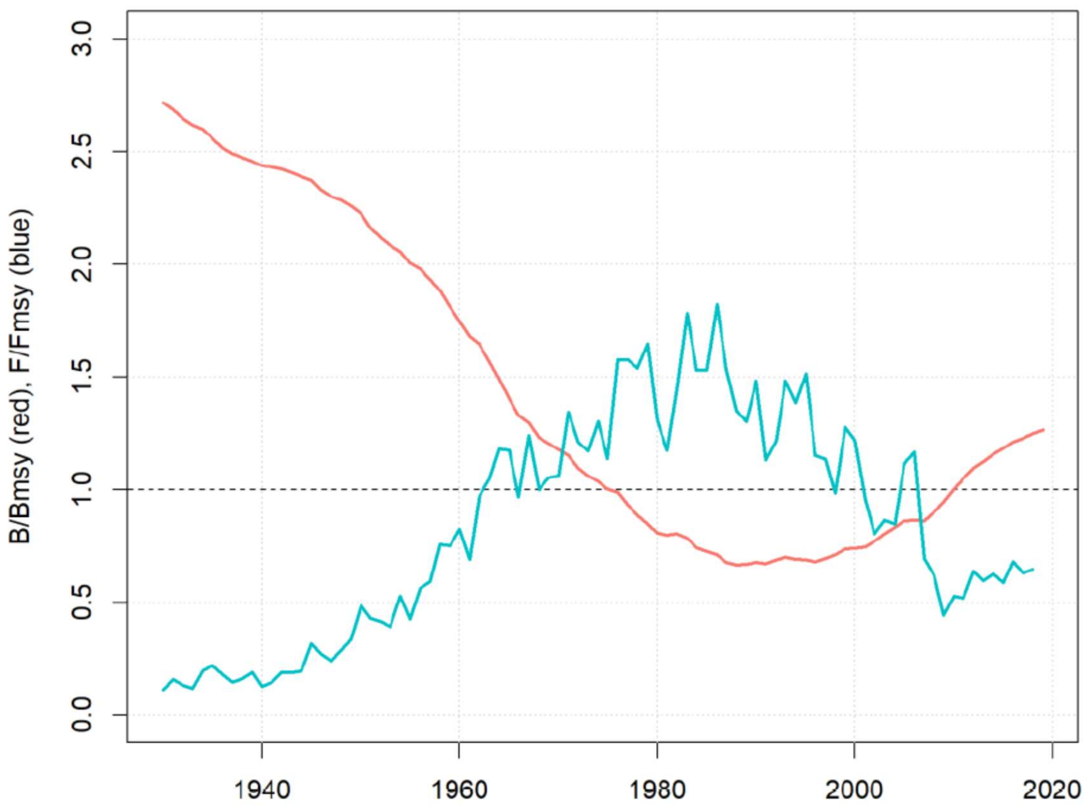


Figure 5. Relative biomass (red) and fishing mortality (blue) trajectories estimated for the JABBA base case of the 2020 North Atlantic stock assessment (from ICCAT 2020).

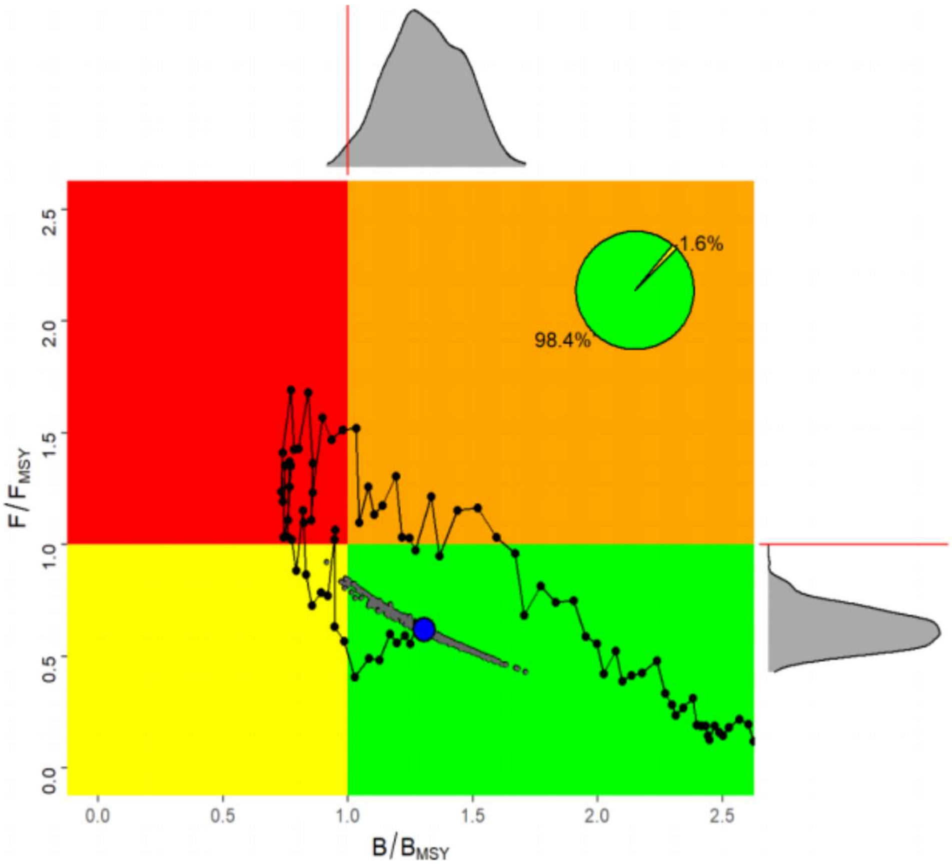


Figure 6. North Atlantic albacore (Kobe plot). Stock status trajectories of B/BMSY and F/FMSY over time (1930-2018), as well as uncertainty (grey dots) around the current (F2018/FMSY, B2018/BMSY) estimate (blue point) based on Surplus production model with probability of being overfished and overfishing (red, 0%), of being neither overfished nor overfishing (green, 98.4%), and of being overfished (yellow, 1.6%) (from ICCAT 2020).

4.2.1.3 Harvest Control and Management Procedures—North Atlantic Albacore Stock

The main contemporary measures addressing conservation and management of North Atlantic albacore tuna by ICCAT are contained in Recommendation 16-06 and Recommendation 17-04. Provisions in Rec. 16-06 establish a Multi-annual Management and Conservation Programme to manage No. Atlantic albacore stock where the objective is:

(1) to maintain the stock in the green zone of the Kobe plot, with at least a 60% probability, while maximizing long-term yield from the fishery, and

(2) where the spawning stock biomass (SSB) has been assessed by the SCRS as below the level capable of producing MSY (SSBMSY), to rebuild SSB to or above SSBMSY, with at least a 60%probability, and within as short time as possible, while maximizing average catch and minimizing inter-annual fluctuations in TAC levels.

Rec. 16-06 also established an annual TAC for CPCs, limits on fishing capacity (number of vessels), control limits, reporting requirements, stock status performance metrics (i.e., probability of being in the Kobe green quadrant), a generic harvest control rule, and requirement implement management decision making using management strategy evaluation methodology. The graphic form of the generic harvest control rule is shown in Figure 7.

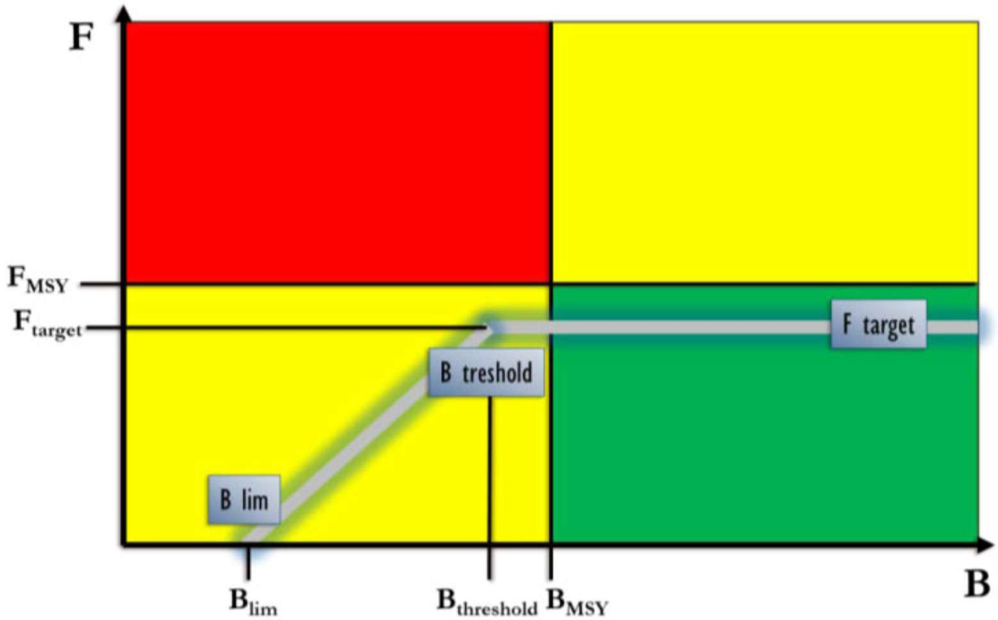


Figure 7. Generic form of the HCR recommended by SCRS (ICCAT 2011a). B_{lim} is the limit biomass reference point, $B_{Threshold}$ is the biomass point at which increasingly strict management actions should be taken as biomass decreases and F_{target}, the target fishing mortality rate to be applied to achieve the management objective [Rec. 16-06] (ICCAT 2017).

In 2017, the SCRS tested a set of alternative HCRs by projecting a wide range of simulated albacore populations in a management strategy evaluation (MSE) framework (ICCAT 2017). The simulated management procedures advanced by the SCRS were designed to support the development and eventual adoption of a North Atlantic albacore HCR in 2017 that would be compatible with output from the stock assessments and provide IATTC with the option of setting the TAC for a three-year period. While a large set of HCRs were tested, eight were considered as candidate HCRs with the following combination of elements: two alternative target fishing mortalities ($0.8F_{MSY}$ and F_{MSY}), two threshold biomasses ($0.8B_{MSY}$ and B_{MSY}), and 2 stability clauses. The 2 stability clauses were: (SC1) maximum change in TAC of 20% always applied from one 3-year management period to the next while also always imposing a 15,000 t -50,000 t min-max TAC; and (SC2) same as (SC1) but not restricting TAC reductions and not imposing a minimum TAC when $B<B_{THR}$. Figure 7 shows the performance of 8 HCRs. The combination of the target fishing mortality (F_{TARGET}), Biomass threshold ($B_{THRESHOLD}$) and the type of stability clause defines the HCR. In HCRs where maximum change in TAC of 20% is always applied (SC1), higher stability and higher long-term yields were achieved, compared to HCRs where the 20% restriction for decrease is not used when $B<B_{THRESHOLD}$

(SC2). Not restricting TAC reductions might allow quicker recoveries if the stock is overexploited but can also cause large unnecessary TAC reductions if the stock is wrongly perceived as overexploited.

Table 10. Performance of 8 HCRs, according to the performance statistics (only one performance indicator per block is shown, which represents median values across 132 operating models). Each HCR has a unique identification number. pGR% = probability of being in the green quadrant of the Kobe plot; pBint% = probability of BTHRESHOLD>B>BLIM; LongY (kt) = mean yield for the period 2030-2045 in thousands of tons; MAP = mean absolute proportional change in catch. (ICCAT 2018)

HCR				Stock Status	Safety	Catch	Stability
Number	Ftar	Bthresh	Stability clause	pGr%	pBint%	LongY (kt)	MAP (%)
1	0,80	0,80	SC2	85,5	9,0	26,5	8,3
2	1,00	0,80	SC2	78,9	13,0	29,0	8,8
3	0,80	1,00	SC2	88,6	8,3	26,9	8,3
4	1,00	1,00	SC2	84,5	9,2	26,9	8,9
1	0,80	0,80	SC1	85,8	9,3	32,1	5,6
2	1,00	0,80	SC1	74,7	15,8	34,1	6,2
3	0,80	1,00	SC1	86,0	10,4	32,2	6,0
4	1,00	1,00	SC1	77,9	14,3	35,0	6,3

Following the advice of the SCRS in 2017, the ICCAT adopted Rec. 17-04 as well as a HCR for North Atlantic albacore with defined reference points. A summary of provisions adopted in Rec. 17-04 include:

- A reassertion of the management objectives of the multiannual management and conservation programme for North Atlantic albacore as set out in paragraph 2 of Rec. 16-06.
- Establishing the following interim reference points for the purpose of the multiannual management and conservation programme for the North Atlantic albacore:
    a. $B_{THRESH} = B_{MSY}$
    b. $B_{LIM} = 0.4*B_{MSY}$
    c. $F_{TAR} = 0.8*F_{MSY}$
    d. $F_{MIN} = 0.1*F_{MSY}$
- A three-year stock assessment schedule for North Atlantic albacore.
- A harvest control rule (HCR) that sets a 3-year constant annual total allowable catch (TAC) using the following three values estimated from the stock assessment. For each value the median values as reported in the summary table of the SCRS report shall be used:

    a. The estimate of current stock biomass (B_{CURR}) with respect to B_{MSY}.
    b. The estimate of the stock biomass at Maximum Sustainable Yield (B_{MSY}).
    c. The estimate of the fishing mortality at MSY (F_{MSY}).

The graphic form of the adopted HCR is shown in Figure 8 and includes the following control parameters:

- The biomass threshold level (B_{THRESH}) is equal to the biomass able to deliver the maximum sustainable yield ($B_{THRESH} = B_{MSY}$).
- A fishing mortality target corresponding to 80% of F_{MSY} ($F_{TAR} = 0.8F_{MSY}$) will be applied when the stock status is at, or above, the threshold level (B_{THRESH}).
- If the current biomass (B_{CURR}) is estimated to be below the threshold level (B_{THRESH}) and higher than B_{LIM}, then fishing mortality will be reduced linearly for the next multiannual management period (F_{NEXT})

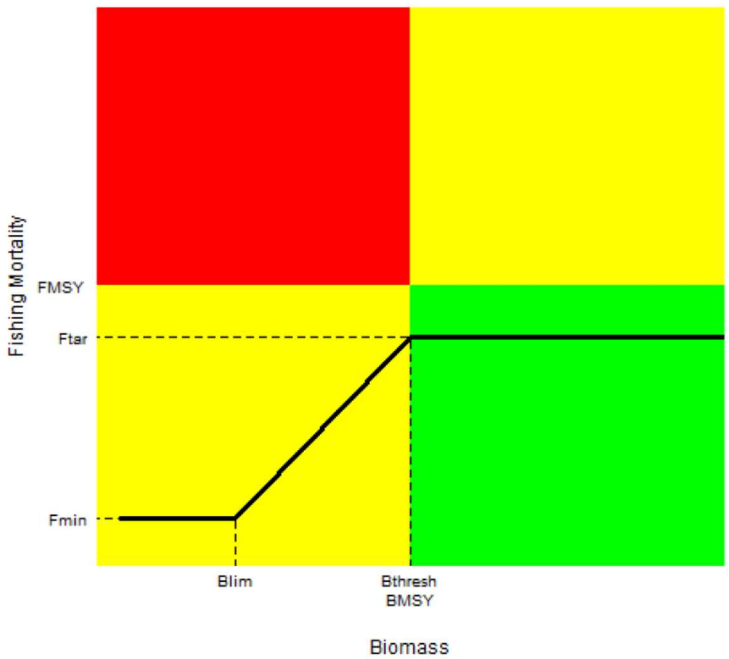


Figure 8. Graphic form of the HCR adopted in Rec 17-04. BLIM (set at 0.4BMSY) is the limit biomass reference point, BTHRESH (set at BMSY) is the point below which fishing mortality decreases linearly, FTAR (set at 0.8FMSY) is the target fishing mortality rate to be applied to achieve the management objectives, and FMIN (set at 0.1FMSY) is the fishing mortality to be applied when B<BLIM (ICCAT 2018).

In 2018, the HCR adopted in Rec 17-04 was tested together with variants accounting for (i) the carry over, (ii) the effect of setting a lower TAC limit of 15,000 t, (iii) the effect of applying the 20% stability clause also when BCUR>BLIM and BCUR<BTHR, and (iv) the effect of 20% maximum TAC reduction and 25% maximum TAC increase when BCUR>BLIM and BCUR<BTHR. Results indicate that the HCR adopted in 17-04 and its new variants achieve ICCAT's management objective of maintaining stocks in the green quadrant of the Kobe plot with at least 60% probability. Also, an external peer review of the MSE framework was conducted in 2018 confirming that the MSE framework is scientifically sound and robust

to uncertainty (Sculley, 2018). On this basis, the 2017 interim HCR implemented based on the MSE outcomes that led to the TAC of 33,600 t had a robust scientific basis. Additional analyses conducted by the SCRS in 2018 based on the same MSE framework suggested that the Commission could adopt variants of the tested HCRs which would provide additional stability to the fisheries while meeting management objectives. It should be noted that there is an extensive workplan to improve the MSE framework used in the evaluation of HCRs based on the recommendations of the external review.

4.2.1.4 Catch Profile —North Atlantic Albacore Stock

Rec. 16-06 established an annual TAC of 28,000 t for 2017 and 2018. However, as Rec. 17-04 adopted a new HCR the TAC established using Rec. 16-06 had to be specified according to the new adopted HCR. Using the criteria adopted in Rec. 17-04 an annual TAC of 33,600 t was specified for 2018 - 2020. This TAC was allocated among 4 different CPCs as presented below. Other ICCAT CPCs had to limit their annual catches to 200 t in 2017-18.

Table 11. Allocation of 2017 and 2018–2020 TACs among CPCs (from ICCAT Recs 16-06 and 17-04).

ICCAT CPC	2017	2018-2020
EU	21,551.3	25,861.6
Taiwan	3.271.7	3,926.0
EEUU	527.0	632.4
Venezuela	250.0	300.0
Summary Reported Catch	**25,600.0**	**30,710.0**
Established TAC	**28,000.0**	**33,600.0**

Considering the results of the 2020 assessment (ICCAT 2020) and following Rec. 17-04, the estimated median biomass and fishing mortality values were used to provide TAC advice for the period 2021-2023 according to the HCR specified in the Recommendation. As current stock biomass is estimated to be above B_{MSY}, the TAC was estimated as:

$TAC_{2021\text{-}2023} = F_{TAR} * B_{curr}$, where $F_{TAR} = 0.8F_{MSY}$. Therefore, $TAC_{2021\text{-}2023} = 0.8\ F_{MSY} * B_{curr}$ = 37,801 tons which corresponds to a 12.5% increase over the previous TAC calculated from the HCR for 2018-2020 (33,600 tons).

4.2.1.5 Total Allowable Catch (TAC) and Catch Data — North Atlantic Albacore Stock

Table 12. Total Allowable Catch (TAC) and Catch Data — North Atlantic Albacore Stock

TAC	Year	2021-2023	Amount	37,801 MT
UoA share of TAC	Year	2021-2023	Amount	4,417 MT
Total green weight catch by UoC	Most recent year	2021	Amount	2,433 MT
Total green weight catch by UoC	Next most recent year	2020	Amount	1,689 MT

4.2.1.6 Stock Status —South Atlantic Albacore Stock

Fishery Indicators

The southern stock is largely exploited by five fisheries; surface bait-boat fleets of South Africa and Namibia and the longline fleets of Taiwan, Brazil and Japan. The surface fisheries target mainly immature and sub-adult fish (70 cm to 90 cm FL), operating seasonally from October to May when albacore is available in coastal waters. The Taiwan longline fleet operates throughout the year over a larger area, consisting of vessels that target larger albacore (60 cm to 120 cm FL) and vessels that take albacore as by-catch, in bigeye directed fishing operations.

Albacore landings from 1950 to 2019 by gear type are shown in Figure 9. Landings increased sharply from the mid-1950s to approximately 25,000 t between the mid-1960s and 1980s. From the mid-1980s to 2000 catches fluctuated between 28,000 t and 35,000 t, and since have declined to approximately 21,200 t. Albacore landings for 2019 decreased to 15,640 t, which is among the lowest value in the time series. Recent Taiwan catches have decreased compared to historical catches, mainly due to a decrease in fishing effort targeting albacore. In 2019, the estimated South African and Namibian catch (mainly bait-boat) was below the average of the last five years. Historically the catch of albacore by Japanese longliners was considered bycatch, but Japan has been targeting albacore in recent years, particularly in waters adjacent to South Africa and Namibia (20°S - 40˚S).

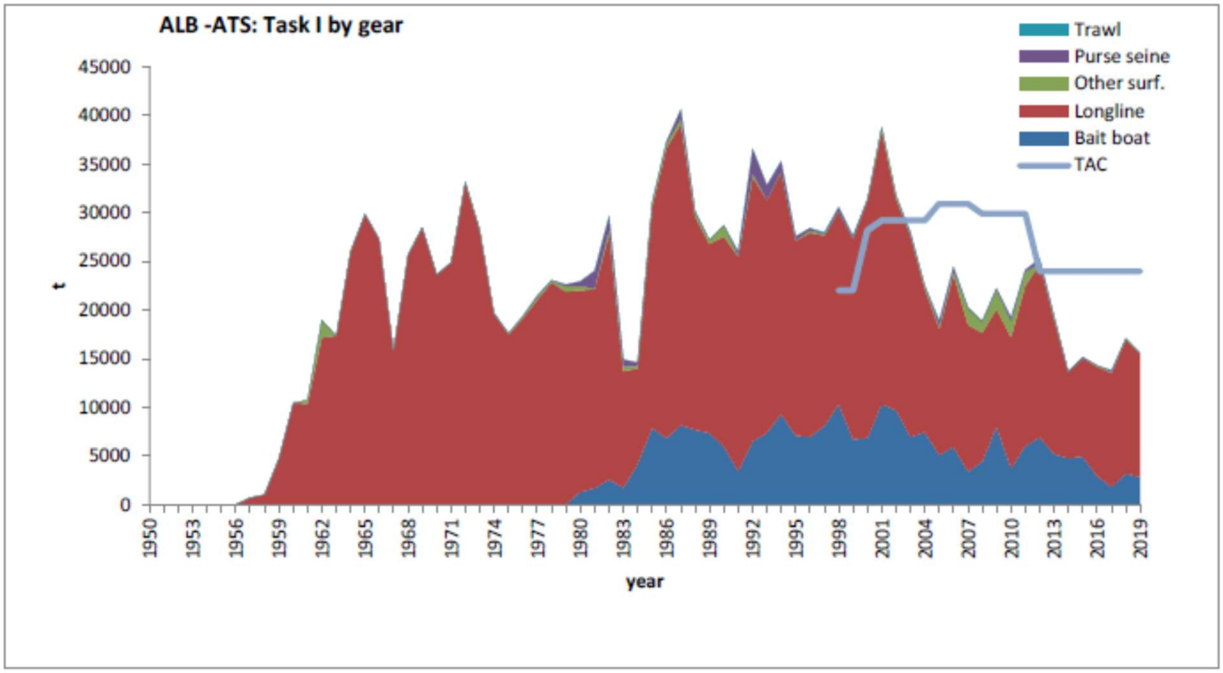


Figure 9. Total albacore catches reported to ICCAT (Task I) by gear for the southern Atlantic stock including TAC's (blue line) (ICCAT 2020).

For the South Atlantic stock, the standardized CPUE indices used in the assessment are mainly based on longline fisheries, which catch mostly adult albacore. The same three longline CPUEs used in 2016 were selected to update the 2020 stock assessment results, including those from Chinese-Taipei, Japan (late time frame), and Uruguay (Figure 10). The longest time series of Taiwan showed a strong declining trend in the early part of the time series followed by a less steep decline over the next three decades (like the Japanese longline index), and an increasing trend since the early 2000s. The Uruguayan longline CPUE series showed a decrease since the 1980s. The Taiwan CPUE was the only index that informed stock trends in recent years. In addition, standardized CPUE series from the Brazilian longline (2002-2018) and the South African bait-boat fishery were made available, which were used for sensitivity analyses.

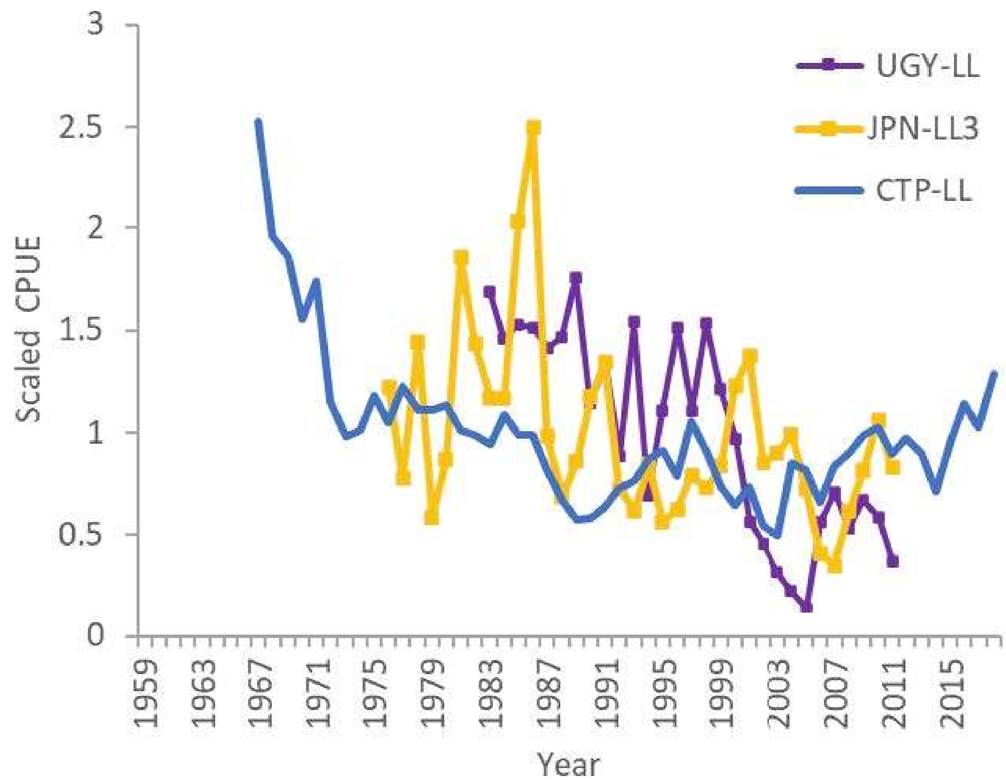


Figure 10. Standardized catch rate time series used in the 2020 South Atlantic albacore stock assessment. Longline fishery series (LL) are generally comprised of adult fish. UGY is the Uruguayan fleet, JPN is the Japanese fleet, and CTP is the Taiwan fleet (from ICCAT 2020).

Status Determination

The latest stock assessment was conducted in 2020 using catch and effort data through 2018. Two production model formulations (ASPIC and JABBA) were evaluated, and after extensive testing the SCRS selected JABBA as the base case model that best represents the population dynamics of albacore and uncertainty around stock status, as well as impact of alternative fishing scenarios. The SCRS further recommended that all management advice be based on the JABBA base case model results, including the projections, and estimated Kobe probability matrices.

The results of the 2020 JABBA base case assessment model for South Atlantic albacore are shown in Table 13 and Figure 11. Results indicate a decreasing biomass trend between the 1950s and the early 2000s and an increasing trend since then as fishing mortality decreased. The stock was fluctuating around MSY from 1988 to 2000, overfished with B below BMSY between the early and late 2001 to 2009, and the stock has since recovered to levels well above BMSY (Figure 11). Fishing mortality increased between the 1950s and 2000, declining thereafter. The stock was experiencing overfishing from the late 1980s to the early 2000s, since then fishing mortality has been well below FMSY (Figure 11).

The 2020 South Atlantic albacore stock assessment estimated MSY at 27,264 t (80% CI 23,734 - 31,567) and BMSY as 124,453 t (80% CI 79,611-223-424) (Table 9). The median estimate of current B2018/BMSY was 1.58 (ranging between 1.14 and 2.05) and the median estimate of current F2018/FMSY was 0.40 (ranging between 0.28 and 0.59). The wide confidence intervals reflect the large uncertainty around the estimates of stock status

The uncertainty around the current stock status has a clear shape determined by the strong correlation between parameters estimated by the production model (Figure 12). The probability of the stock currently being in the green area of the Kobe plot (not overfished and not undergoing overfishing, F<FMSY and B>BMSY) is 99.4% while the probability of being in the yellow area (overfished, B<BMSY) is 0.6%. The probability of being in the red area (overfished and undergoing overfishing, F>FMSY and B<BMSY) is 0%.

It was noted there is still a level of the real uncertainty that is not reflected in the model(s) results, and that the management advice provided should be taken with caution. The Group raised concerns about recent catches of southern albacore (2017-2018) having been below (~ 60%) the TAC advice provided (Rec. 16-07, 24,000 t). It is important to understand if this is related to capacity, catchability, or if is indicative of stock abundance levels inconsistent with stock assessment results.

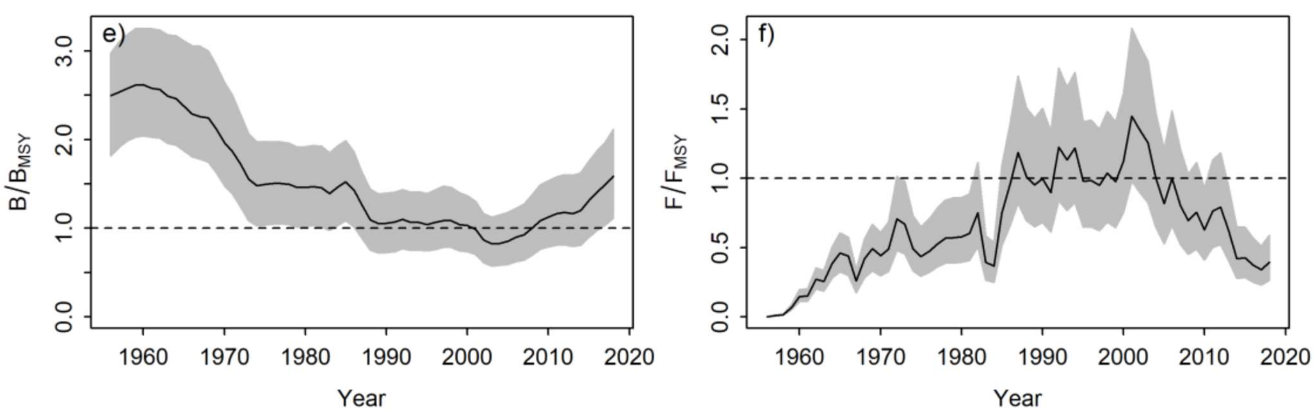


Figure 11. JABBA assessment base case model results showing trends of biomass relative to BMSY (B/BMSY) and fishing mortality relative to FMSY (F/FMSY) for the South Atlantic albacore.

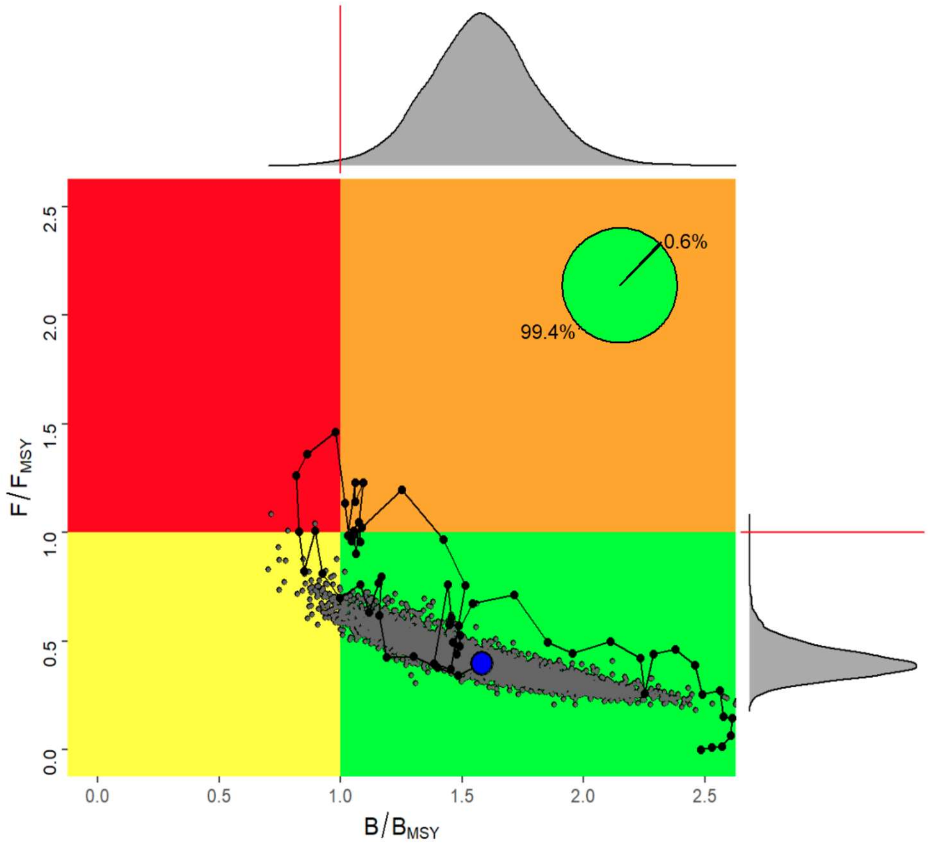


Figure 12. South Atlantic albacore (Kobe plot). Stock status trajectories of B/BMSY and F/FMSY over time (1956-2018), as well as uncertainty (grey dots) around the current (2018) estimate (blue point) based on JABBA Bayesian surplus production model with probability of being overfished and overfishing (red, 0%), of being neither overfished nor overfishing (green, 99.4%), and of being overfished (yellow, 0.6%).

Harvest Control and Management Procedures – South Atlantic Albacore Stock

Testing of harvest control rules and management procedures for the South Atlantic albacore stock is significantly less compared to testing on the North Atlantic albacore stock. ICCAT's management objective for South Atlantic Albacore tuna is embedded in the preamble of its Convention finalized in 1966. The preamble states: "*The Governments (…) considering their mutual interest in the populations of tuna and tuna-like fishes found in the Atlantic Ocean and desiring to cooperate in maintaining the populations of these fishes at levels which will permit the maximum sustainable catch for food and other purposes*". ICCAT's objective is therefore to maintain populations of tunas and tuna-like fishes at levels that will permit MSY. With adoption and implementation of ICCAT Rec. 11-13, those stocks determined to be overfished and subject to overfishing the Commission is mandated to immediately adopt management measures designed to result in a high probability of ending overfishing and rebuild the stock in as short a period as possible, subject to scientific information and advice. The current strategy is to adopt an agreed upon TAC that limits catches to sustainable levels based scientific advice that evaluates, and accounts for, changing circumstances. Furthermore, the TAC is set at the median level which stock projections indicate that biomass will continue to increase based on the established objective of a 60% probability of being in the "green zone" of the Kobe plot ($B>B_{MSY}$, $F<F_{MSY}$). Meeting this objective demonstrates that the strategy is responsive to the status of the stock.

In 2016, ICCAT established a new South Atlantic albacore TAC of 24,000 t for 2017-2020 (Rec. 16-07). The Committee noted that, since 2004, reported catches remained below 24,000 t, except in 2006, 2011 and 2012, where reported catches were slightly above this value. Rec. 16-07 also required enhanced reporting requirements for vessels catching albacore, established protocols for CPC TAC overages and underages, and established allocations of South Atlantic Albacore between CPCs as below (noting that CPCs not listed shall limit their catches to 25 t):

	*Catch limits (t)**
Angola	50
Belize	250
Brazil	2 160
China	200
Chinese Taipei	9 400
Cote d'Ivoire	100
Curacao	50
European Union	1 470
Japan	1 355
Korea	140
Namibia	3 600
South Africa	4 400
St Vincent and Grenadines	140
UK St Helena	100
Uruguay	440
Vanuatu	100

* The following annual transfers of catch limits shall be authorized:
From Brazil to Japan: 100 t in 2017-2020
From Uruguay to Japan: 100 t in 2017-2018
From South Africa to Japan: 100 t in 2019-2020

TAC Stock projections at a level consistent with the MSY (27,264 t) showed that probabilities of being in the green quadrant of the Kobe plot would remain very high (90%) through 2033, the terminal year of the projection period (Table 13). In fact, increasing the annual TAC to 30,000 t would maintain stock levels above BMSY until 2033 with a probability higher than 60%. It is important to note that these catch levels exceed MSY and a reduction in TAC after 2033 to prevent overfishing would likely be required.

Table 13. South Atlantic albacore estimated probabilities (in %) based on the JABBA Bayesian surplus production model that the stock fishing mortality is below FMSY (a), biomass is above BMSY (b) and both (c). Projections for constant catch levels (16000 t to 34000 t) are shown.

a. Probability F < FMSY

TAC | Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
16000	100	100	100	100	100	100	100	100	100	100	100	100	100
18000	100	100	100	100	100	100	100	100	100	100	100	100	100
20000	100	100	100	100	100	100	100	100	100	100	100	100	100
21000	100	100	100	100	100	100	100	100	100	100	100	100	100
22000	100	100	100	100	100	100	100	100	100	100	99	99	99
23000	100	100	100	100	100	100	99	99	99	99	99	99	99
24000	100	100	100	99	99	99	99	99	99	99	99	98	98
25000	100	100	99	99	99	99	98	98	98	98	98	97	97
26000	99	99	99	99	98	98	98	97	97	96	95	95	94
27000	99	99	98	98	97	97	96	95	94	93	92	91	90
28000	99	98	98	97	96	95	93	92	91	89	87	86	84
29000	99	98	97	96	94	93	90	88	85	82	80	77	74
30000	98	97	96	94	91	89	85	81	78	73	70	65	62
32000	97	95	92	88	82	76	69	62	56	49	44	39	35
34000	95	91	85	77	67	57	48	40	32	27	22	19	16

b. Probability B > B_{MSY}

TAC | Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
16000	100	100	100	100	100	100	100	100	100	100	100	100	100
18000	100	100	100	100	100	100	100	100	100	100	100	100	100
20000	100	100	100	100	100	100	100	100	100	100	100	100	100
21000	100	100	100	99	99	99	99	99	99	99	99	99	99
22000	100	100	100	99	99	99	99	99	99	99	99	99	99
23000	100	100	100	99	99	99	99	99	99	99	99	99	98
24000	100	99	99	99	99	99	99	99	98	98	98	98	98
25000	100	100	99	99	99	99	98	98	98	98	97	97	97
26000	100	99	99	99	99	99	98	98	97	97	96	95	95
27000	100	99	99	99	98	98	97	97	96	95	94	93	92
28000	100	99	99	99	98	97	96	95	94	93	91	90	88
29000	100	99	99	98	98	97	96	94	92	90	88	85	83
30000	100	99	99	98	97	96	94	92	89	86	83	79	76
32000	100	99	99	98	96	93	89	85	80	74	68	62	56
34000	100	99	98	96	93	89	82	75	66	58	49	42	36

c. Probability of Kobe Plot Green Status

TAC | Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
16000	100	100	100	100	100	100	100	100	100	100	100	100	100
18000	100	100	100	100	100	100	100	100	100	100	100	100	100
20000	100	100	100	100	100	100	100	100	100	100	100	100	100
21000	100	100	100	99	99	99	99	99	99	99	99	99	99
22000	100	100	100	99	99	99	99	99	99	99	99	99	99
23000	100	100	99	99	99	99	99	99	99	99	99	98	98
24000	100	99	99	99	99	99	99	98	98	98	98	98	98
25000	100	99	99	99	99	98	98	98	98	97	97	97	96
26000	99	99	99	98	98	98	97	97	96	96	95	94	94
27000	99	99	98	98	97	97	96	95	94	93	92	91	90
28000	99	98	98	97	96	95	93	92	90	89	87	85	83
29000	99	98	97	96	94	93	90	88	85	82	79	77	74
30000	98	97	96	94	91	89	85	81	78	73	69	65	61
32000	97	95	92	88	82	76	69	62	56	49	44	39	35
34000	95	91	85	77	67	57	48	40	32	27	22	19	16

4.2.1.7 Catch Profile — South Atlantic Albacore Stock

Rec. 16-07 established an annual TAC of 24,000 t for 2017 - 2020. This TAC was allocated among 14 different CPCs and catches from 2017-2019 are presented below. Other ICCAT CPCs had to limit their annual catches to 25 t.

Table 14. TAC (in tonnes) allocated among 14 different CPCs and catches from 2017-2019 (ICCAT 2020).

ICCAT CPC	2017	2018	2019
Angola	0	0	0
Belize	219	311	158
Brazil	497	396	1,003
China	185	116	132
Taiwan	9,090	9,227	9,626
Cote d'Ivoire	0	6	19
Curacao	10	0	0
EU	434	330	192
Japan	1,189	2,985	1,527
Korea	86	167	170
Namibia	214	888	260
South Africa	1,785	2,572	2,455
St Vincent and Grenadines	101	98	31
UK Sta. Helena	0	0	0
Uruguay	0	0	0
Vanuatu	0	0	0
Summary Reported Catch	**13,810**	**17,096**	**15,573**
Established TAC	**24,000**	**24,000**	**24,000**

4.2.1.8 Total Allowable Catch (TAC) and catch data

Table 15. Total Allowable Catch (TAC) and catch data – South Atlantic Albacore

TAC	Year	2021-2023	Amount	24,000 MT
UoA share of total TAC	Year	2021	Amount	9,400 MT
Total green weight catch by UoC	Most recent year	2021	Amount	5,634 MT
Total green weight catch by UoC	Next most recent year	2020	Amount	5,634 MT

4.2.2 Principle 1 Performance Indicator scores and rationales

PI 1.1.1 – Stock Status—North Atlantic Albacore Stock

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				

ICCAT regularly assesses the status of North Atlantic albacore tuna and the latest assessment was conducted in 2020 using data through 2018 and the same modelling procedures as in 2016 (ICCAT 2020). The northern stock is exploited by surface fisheries targeting mainly immature and sub-adult fish (50 cm to 90 cm FL) and longline fisheries targeting immature and adult albacore (60 cm to 130 cm FL). EU fleets comprise the majority of surface fisheries which operate seasonally, while the Taiwan fleet that operates year-round constitutes the main longline fishery.

Four longline and one bait-boat CPUE indices were used in the production model to determine stock status: 1) the weight index from the Taiwan LL (1981-2018), 2) the Japanese longline index (1976-2018) excluding the 2013 observation, 3) the Venezuela longline index (1991-2017) excluding 2018 observation, 4) the USA longline index (1987-2018), and 5) the Spanish bait-boat index (1981-2018).

Stock status determinations in 2020 were initially conducted using two production models formulations (ASPIC and JABBA), and all results and conclusions based on converged model runs. Model diagnostics, including likelihood profiles, residuals of fit, and retrospective analyses, as well as the model's likelihood to accurately represent uncertainty, were used to evaluate the utility of each model. Retrospective analysis was limited to the last 5 years of data and the pattern was minimal for the first 3 years of data, whereas removing 4 years yielded a result like the 2016 assessment, conducted 4 years ago. Additionally, alternative indices that the SCRS considered adequate in their formulation were included as a sensitivity run in the 2020 albacore assessment. Such indices include JPN-LL1 (1959-1969), JPN-LL3 (1976-2018), JPN-LL core (1976-2018), Brazil longline (BRA-LL, 2002-2018) and South Africa bait-boat (ZAF-BB, 2003-2018).

The SCRS concluded that JABBA and ASPIC results were consistent and similar in terms of central tendency, but that JABBA enables to capture more of the uncertainty by accounting for both observation and process error. It was recommended that stock status and provided management advice be based on the JABBA base case model results only, including the projections, and estimated Kobe probability matrices.

The 2020 North Atlantic albacore stock assessment estimated MSY at 36,816 t (80% CI (35,761 - 38,039) and B_{MSY} as 392,556 t (349,403 - 405,097). The results show B_{2019}/B_{MSY} is 1.32 (80% CI 1.13-1.51) and F_{2019}/F_{MSY} was 0.62 (0.52-0.74) (see Table 9). The probability of the stock currently being in the green area of the Kobe plot (not overfished and not undergoing overfishing, F<FMSY and B>BMSY) is 98.4% while the probability of being in the yellow area (overfished, B<BMSY) is 1.66%. The probability of being in the red area (overfished and undergoing overfishing, F>FMSY and B<BMSY) is 0% (Figure 6). Based on the results of the 2020 stock assessment, North Atlantic albacore tuna are not overfished and are not subject to overfishing.

PRI for the North Atlantic albacore stock is set at B_{LIM} =0.4BMSY. Biomass at MSY in 2019 was estimated at 3.3 times that of B_{LIM} (80% CI, 2.83-3.78) for the base case. The fishing mortality should be below $0.8F_{MSY}$ and it is estimated at 0.62 (80% CI, 0.52-0.74) (ICCAT 2020). Note there is a 98.4% probability that the stock is not

overfished and no overfishing is taking place, therefore there is a high degree of certainty (≥95%ile) that the stock is above the PRI; requirements at the SG60, SG80, and SG100 levels are met.				
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	Yes
Rationale				
The results of the JABBA base case assessment model for North Atlantic albacore indicate a decreasing biomass trend between the 1930s and the 1990s and an increasing trend since then. The stock was overfished with B below B_{MSY} between the 1970s and 2000s, and the stock has recovered to levels well above B_{MSY} (see Figure 7). Fishing mortality increased between the 1930s and 1980s, declining thereafter. The stock was experiencing overfishing from the 1960s to early 2000s; since then fishing mortality has been well below F_{MSY}. The probability of the stock currently being in the green area of the Kobe plot (not overfished and not undergoing overfishing, $F<F_{MSY}$ and $B>B_{MSY}$ is 98.4% while the probability of being in the yellow area (overfished, $B<B_{MSY}$) is 1.66%. The probability of being in the red area (overfished and undergoing overfishing, F>FMSY and $B<B_{MSY}$) is 0%. Based on this information there is a high degree that the stock has been above a level consistent with MSY over recent years; SG80 and SG100 are met.				
References				
ICCAT 2016, ICCAT 2020				
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)	B_{LIM} F_{MIN}	$B_{LIM} = 0.4*B_{MSY}$ $F_{MIN}= 0.1*F_{MSY}$	$B_{2019}=3.3B_{LIM}$	
Reference point used in scoring stock relative to MSY (SIb)	B_{THRESH} F_{TAR}	$B_{THRESH} = B_{MSY}$ $F_{TAR} = 0.8*F_{MSY}$	B_{2019}/B_{MSY}=1.32 (80% CI = 1.13-1.51). F_{2018}/F_{MSY} = 0.62 (80% CI = 0.52-0.74)	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range			≥80	
Information gap indicator			Information is sufficient to score PI	
Overall Performance Indicator scores added from Client and Peer Review Draft Report				

Overall Performance Indicator score	

PI 1.1.2 – Stock rebuilding—Northern Stock

<table>
<tr><td colspan="2">PI 1.1.2</td><td colspan="3">Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Rebuilding timeframes</td></tr>
<tr><td>Guide post</td><td>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.</td><td></td><td>The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.</td></tr>
<tr><td>Met?</td><td>Not scored</td><td></td><td>Not scored</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">There is no rebuilding plan.</td></tr>
<tr><td rowspan="3">b</td><td colspan="4">Rebuilding evaluation</td></tr>
<tr><td>Guide post</td><td>Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.</td><td>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.</td><td>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.</td></tr>
<tr><td>Met?</td><td>Not scored</td><td>Not scored</td><td>Not scored</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">There is no rebuilding plan.</td></tr>
<tr><td colspan="5">References</td></tr>
<tr><td colspan="5"></td></tr>
</table>

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	Not scored
Information gap indicator	More information sought / Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	N/A

PI 1.2.1 – Harvest strategy—Northern Stock

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	Yes	Yes

Rationale

ICCAT's objective is delineated in the preamble of its Convention finalized in 1966, stating: "The Governments (…) considering their mutual interest in the populations of tuna and tuna-like fishes found in the Atlantic Ocean, and desiring to cooperate in maintaining the populations of these fishes at levels which will permit the maximum sustainable catch for food and other purposes". Therefore, ICCAT's objective is to maintain populations of tunas and tuna-like fishes at levels that will permit maximum sustainable yield (MSY). With the implementation of ICCAT Rec 98-08 in 1998 fishing capacity was limited to the average observed between 1993-1995; as a result, fishing mortality on this stock decreased. Additionally, Rec. 11-13 mandates that for stocks that are overfished and subject to overfishing the Commission shall immediately adopt management measures designed to result in a high probability of ending overfishing and rebuilding the stock in as short a period as possible, subject to scientific information and advice. Furthermore, management objectives for North Atlantic albacore have been established through Rec. 16-06, Recommendation by ICCAT on a Multi-annual Conservation and Management Program for North Atlantic Albacore and Rec. 17-04, Recommendation by ICCAT on a Harvest Control Rule for North Atlantic Albacore Supplementing the Multiannual Conservation and Management Programme, Rec. 16-06.

Rec 16-06 states, "Contracting Parties and Cooperating non-Contracting Parties, Entities or Fishing Entities (CPCs) whose vessels fish North Atlantic albacore in the Convention area shall implement this Multi-annual Conservation and Management Program, of which the management objective for the No. Atlantic albacore stock is:

to maintain the stock in the green zone of the Kobe plot, with at least a 60% probability, while maximizing long term yield from the fishery, and

where the spawning stock biomass (SSB) has been assessed by the SCRS as below the level capable of producing MSY (SSBMSY), to rebuild SSB to or above SSBMSY, with at least a 60% probability, and within as short time as possible, while maximizing average catch and minimizing inter - annual fluctuations in TAC levels."

Rec. 16-06 also established an annual TAC for CPCs, limits on fishing capacity (number of vessels), control limits, reporting requirements, stock status performance metrics (i.e., probability of being in the Kobe green quadrant), a generic harvest control rule, and requirement implement management decision making using management strategy evaluation methodology.

In 2017, the SCRS tested a set of alternative HCRs by projecting a wide range of simulated albacore populations in a management strategy evaluation (MSE) framework (Merino et al. 2017). The simulated management procedures advanced by the SCRS were designed to support the development and eventual adoption of a North

Atlantic albacore HCR in 2017 that would be compatible with output from the stock assessments and provide IATTC with the option of setting the TAC for a three-year period. Following the advice of the SCRS in 2017, the ICCAT adopted Rec. 17-04 as well as a HCR for North Atlantic albacore with defined reference points. A summary of provisions adopted in Rec. 17-04 include: A reassertion of the management objectives of the multiannual management and conservation programme for North Atlantic albacore as set out in paragraph 2 of Rec. 16-06. Establishing an interim reference point for the purpose of the multiannual management and conservation programme for the North Atlantic albacore. A three-year stock assessment schedule for North Atlantic albacore. A harvest control rule (HCR) that sets a 3-year constant annual total allowable catch (TAC) using stock status determination metrics estimated from the stock assessment. The graphic form of the adopted HCR is shown in Figure 7 and includes the following control parameters: The biomass threshold level (BTHRESH) is equal to the biomass able to deliver the maximum sustainable yield (BTHRESH = BMSY). A fishing mortality target corresponding to 80% of FMSY (FTAR = 0.8FMSY) will be applied when the stock status is at, or above, the threshold level (BTHRESH). If the current biomass (BCURR) is estimated to be below the threshold level (BTHRESH) and higher than BLIM, then fishing mortality will be reduced linearly for the next multiannual management period (FNEXT). Based on this information the harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80 and requirements at the SG60 level are met. The ICCAT decision making framework outlined in Rec 11-13 specifies a series of management responses based on the status of ICCAT stocks. Over time, For North Atlantic albacore the Commission has established annual TACs consistent with the advice of the SCRS. Management measures for North Atlantic albacore were first adopted by the Commission in 1998 (Rec. 98-08) and periodically updated as necessary (Rec. 07-02 (catch limits), Rec. 09-05, Rec. 11-04, and Rec. 13-05 (establish a rebuilding program), Rec. 16-06 (define management objectives and generic HCR), and Rec. 17-04 (define interim reference points and an explicit HCR with pre-determined management responses). Based on this information 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 and requirements at the SG80 level are met. The relative abundance of North Atlantic albacore has continued to increase over the last decade and the probability that the stock is currently not overfished (B>BMSY) and not experiencing overfishing (F<FMSY) is 98.4%. The projections assuming catch or TAC levels similar to those observed during the last five years (between 25,000 t and 35,000 t) suggested that biomass would continue to increase and are likely sustainable. The MSE results indicated that the adopted HCR would meet the objective to be in the green quadrant of the Kobe plot with a probability higher than 60%. Based on this information the harvest strategy is responsive to the state of the stock and designed to meet stock management objectives reflected in PI 1.1.1 SG80; requirements at the SG100 level are met. Note this is a harmonized score resulting from discussions with other CABs conducting MSC assessments on North Atlantic albacore tuna.	
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	Yes

Rationale

Management measures to end overfishing of the North Atlantic albacore stock were introduced through Rec. 98-08 and Rec. 99-05 and there is evidence that the harvest strategy is achieving its objectives to rebuild stocks towards agreed targets. Resulting from the adoption of recent management interventions stock biomass has rebuilt to levels well above BMSY.

In 2017, an MSE framework was used to identify candidate reference points (e.g., $SSB_{THRESHOLD}$, SS_{BLIM} and F_{TARGET}) and potential HCRs that would meet established management objectives ($B>B_{MSY}$ and $F<F_{MSY}$; the green quadrant of the Kobe plot) with a specified level of risk (greater than 60% probability of meeting the management objective). A total of 132 operating models formed the basis for the MSE testing, each with differing hypotheses and attributes. In HCRs where maximum change in TAC of 20% is always applied (SC1), higher stability and higher long term yields were achieved, compared to HCRs where the 20% restriction for decrease is not used when $B<B_{THRESHOLD}$ (SC2) (Table 16).

Considering the above evaluation of the harvest control rules it can be deduced that the performance of the harvest strategy has been fully evaluated and considering that the stock is well above the B_{THRESH}, it shows that the harvest strategy is achieving its objectives. including being clearly able to maintain stocks at target levels and therefore SG60, SG80 and SG100 are met.

Table 16. Performance of 8 HCRs, according to the performance statistics defined by Panel 2 (only one performance indicator per block is shown, which represents median values across 132 operating models). Each HCR has a unique identification number. pGR% = probability of being in the green quadrant of the Kobe plot; pBint% = probability of $B_{THRESHOLD}>B>B_{LIM}$; LongY (kt) = mean yield for the period 2030-2045 in thousands of tons; MAP = mean absolute proportional change in catch. (ICCAT 2018)

HCR				Stock Status	Safety	Catch	Stability
Number	Ftar	Bthresh	Stability clause	pGr%	pBint%	LongY (kt)	MAP (%)
1	0,80	0,80	SC2	85,5	9,0	26,5	8,3
2	1,00	0,80	SC2	78,9	13,0	29,0	8,8
3	0,80	1,00	SC2	88,6	8,3	26,9	8,3
4	1,00	1,00	SC2	84,5	9,2	26,9	8,9
1	0,80	0,80	SC1	85,8	9,3	32,1	5,6
2	1,00	0,80	SC1	74,7	15,8	34,1	6,2
3	0,80	1,00	SC1	86,0	10,4	32,2	6,0
4	1,00	1,00	SC1	77,9	14,3	35,0	6,3

c	Harvest strategy monitoring

	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Yes		
Rationale				
Monitoring is adequate to determine whether the harvest strategy is working. Catches and CPUE are monitored and reported on a yearly basis as CPCs are obligated to annually report data to ICCAT; catch data (Task I) and catch-effort (Task II). The data are reviewed annually during the species group meeting, the SCRS meeting, and the Commission meeting. Benchmark North Atlantic albacore stock assessments are conducted every 3 years, the last one having occurred in 2020. On this basis SG60 is met.				
d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			No
Rationale				
The SCRS regularly conducts stock assessments, re-evaluates the utility of the reference points, and determines if objectives of the ICCAT Convention are being met. In 2017, ICCAT adopted an interim HCR with a maximum TAC of 50,000 t and a maximum change of 20% when BCUR>BTHR. Through its application a TAC of 33,600 t was established for 2018-2020 and a TAC of 37,801 t for the period 2021-2023. As specified in Rec. 17-04 the Commission shall review the interim HCR in 2020 with a view to adopting a long-term management procedure. Unfortunately, there is no evidence of any formal review of the harvest strategy in 2020. We note Scully (2018) reviewed the MSE code but this does not constitute a review of the harvest strategy. On this basis, SG100 is not 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?	NA	NA	NA
Rationale				
This is not applicable as sharks are not targeted.				
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
The fishing gear used by the UoA (longline) is selective, the size of fish caught depending on hook size. Based on logbook records for the UoA approximately 0.004% of the catch is discarded annually. The mortality caused by the UoA on the North Atlantic albacore stock due to the unwanted catches is considered negligible, since stock biomass has been steadily increasing since the 1990s (ICCAT 2020). Consistent with GSA3.5.3 the Assessment Team considers the unwanted catch to be negligible and therefore this SI is not scored.
References
ICCAT 2016, ICCAT 2018, Sculley 2018, ICCAT 2020, Merino et al. 2017

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.2 – Harvest control rules and tools—Northern Stock

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	Yes	Yes
Rationale				

A well-defined HCR was agreed in 2017 and has been in place for 2018 onwards. There is a decision-framework (Rec. 11-13) which meets MSC requirements. The ICCAT Commission requested SCRS to identify a limit reference point for Northern albacore (Rec. 11-04). Management advice has been provided based on projections making use of Harvest Control Rule options consistent with the policies identified in Rec. 11-13, and using the following established interim reference points:

- $B_{THRESH} = B_{MSY}$,
- $B_{LIM} = 0.4*B_{MSY}$,
- $F_{TAR} = 0.8*F_{MSY}$,
- $F_{MIN}= 0.1*F_{MSY}$.

IATTC Rec. 15-04, 15-07 & 16-06 tasked the SCRS with evaluating candidate HCRs through a MSE framework, which was completed in 2017. HCR specifications are outlined in IATTC Rec 16-06, and Rec 17-04 and specifies target exploitation rates and exploitation rate reductions as the PRI is approached. The form of the HCR is shown in Figure 7 and the following control parameters apply:

The biomass threshold level (B_{THRESH}) is equal to the biomass able to deliver the maximum sustainable yield ($B_{THRESH} = B_{MSY}$).

A fishing mortality target corresponding to 80% of FMSY ($F_{TAR} = 0.8*F_{MSY}$) will be applied when the stock status is at, or above, the threshold level (B_{THRES}H).

The HCR intends to keep the stock at or above the MSY level. Because the HCR is well-defined and in-place, and has target consistent with MSC requirements, it meets SG60 and SG80.

In 2018, an external peer review was conducted, and it confirmed that, overall, the MSE framework appears to be scientifically sound and robust to uncertainty (Merino et al 2017). Thus, the interim HCR adopted by the Commission in 2017 that led to a TAC of 33,600 t had a robust scientific basis. The working group completed considerable work in 2018 based on the MSE framework and there is an extensive workplan to improve the MSE

framework used in the evaluation of HCRs based on the recommendations of the external review. As the probability of the stock currently being in the green area of the Kobe plot (not overfished and not undergoing overfishing, $F<F_{MSY}$ and $B>B_{MSY}$) is 98.4%, the probability of being in the yellow area (overfished, $B<B_{MSY}$) is 1.6%, and the probability of being in the red area (overfished and undergoing overfishing, $F>F_{MSY}$ and $B<B_{MSY}$) is 0% (ICCAT 2020), it can be concluded that the HCR is expected to keep the stock fluctuating at or above a target level consistent with MSY. We note North Atlantic albacore tuna is not a key LTL species and therefore MSY is considered to be an ecologically appropriate target level, most of the time. Also, ICCAT has initiated development of an ecosystem report card to monitor the ecological impacts of fisheries on the Atlantic ecosystem which in time may provide insights into the ecological role of albacore in the Atlantic Ocean.				
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?		Yes	No
Rationale				

The current HCR established under Rec. 17-04 is an interim measure developed and tested using an MSE process that accounts for the main uncertainties in the stock assessment and provides probabilistic management metrics. Results of the testing in 2017 indicated that the implementation of any of the tested HCRs would meet the objective to be in the green quadrant of the Kobe plot (with a probability higher than 60%). HCR testing was extended in 2018 to assess four additional management measures that accounted for:

- the carry over
- the effect of setting a lower TAC limit of 15,000t
- the effect of applying the 20% stability clause also when $B_{CUR}>B_{LIM}$ and $B_{CUR}<B_{THR}$, and
- the effect of 20% maximum TAC reduction and 25% maximum TAC increase when $B_{CUR}>B_{LIM}$ and $B_{CUR}<B_{THR}$.

Testing results indicated that the HCR adopted in 17-04, including the four new measures achieve ICCAT's management objective of maintaining stocks in the green quadrant of the Kobe plot with at least 60% probability. Additional testing occurred in 2020 including (a) evaluating the impact of one or more indices not being updated for the 2020 stock assessment and (b) new figures were generated to evaluate the fits of the indices available in 2013 in the Operating Models that were conditioned from the scenarios developed in the 2013 stock assessment. Results suggested that even in the exceptional circumstance that one or more index was not available for stock assessments, the HCR would still achieve management objectives. On this basis requirements at the SG80 level are met.

While the HCR accounts for a wide range of uncertainties the ecological role of the stock has not been tested nor have assumptions regarding selectivity. On this basis requirements at the SG100 level are not met.

c	HCRs evaluation			
	Guide	There is some evidence that tools used or available to	Available evidence indicates that the tools in use are	Evidence clearly shows that the tools in use are

	Post	implement HCRs are appropriate and effective in controlling exploitation.	appropriate and effective in achieving the exploitation levels required under the HCRs.	effective in achieving the exploitation levels required under the HCRs.
	Met?	Yes	Yes	No

Rationale
The current level of control has led to the recovery of the North Atlantic albacore stock. Management measures (catch limits) adopted by ICCAT starting in 1998 have been successful in reducing fishing mortality below F_{MSY} and rebuilding the stock biomass to above B_{MSY}. Since the establishment of the TAC in 2001 catch has generally remained below the TAC, and protocols have been established to address overages and underage's of allocated TACs (Rec. 07-02). Application of the Rec. 17-04 HCR established a TAC of 33,600 t for 2018-2020. Based on results of the 2020 stock assessment there was a 98.4% chance the stock is in the green area of the Kobe plot, B2019/BMSY is estimated at 1.32 (80% CI 1.13-1.51) and F2018/FMSY at 0.62 (80% CI 0.52-0.74) (ICCAT 2020); the stock is not overfished or experiencing overfishing. It can therefore be said that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCR. On this basis the SG60 and SG80 levels are met Application of the Rec. 17-04 HCR established a TAC of 33,600 t for 2018-2020 and the possibility to carry over some unused portions of the quotas to be caught later in time (Rec. 16-06) remained. Based on results of the 2020 stock assessment there is a 98.4% chance the stock is in the green area of the Kobe plot, B2019/B_{MSY} is estimated at 1.32 (80% CI 1.13-1.51) and F2018/F_{MSY} at 0.62 (80% CI 0.52-0.74) (ICCAT 2020); the stock is not overfished or experiencing overfishing. Based on this information the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs and SG60 and SG80 are met. While in theory the tools are adequate, clear evidence of their efficacy is lacking. As the HCR has only recently been implemented it is too early to say the evidence clearly shows that the tools in use are effective. On this basis the SG100 is not met.
References
ICATT 2020
Draft scoring range and information gap indicator added at Announcement Comment Draft Report

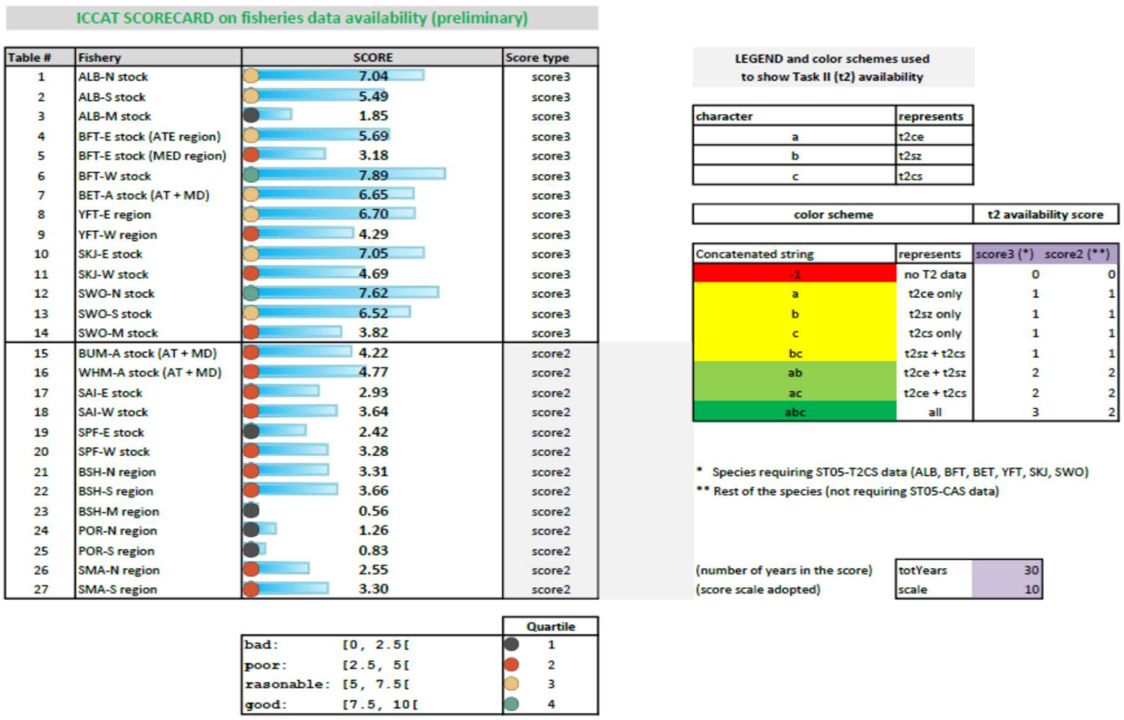
Draft scoring range	≥80
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.3 – Information and monitoring—Northern Stock

<table>
<tr><td colspan="2">PI 1.2.3</td><td colspan="3">Relevant information is collected to support the harvest strategy</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Range of information</td></tr>
<tr><td>Guide post</td><td>Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.</td><td>Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.</td><td>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.</td></tr>
<tr><td>Met?</td><td>Yes</td><td>Yes</td><td>No</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">There is adequate information to determine whether the harvest strategy is working. Catches and CPUE are monitored, reported and reviewed regularly during species group, SCRS, and ICCAT Meetings, as CPCs are required to annually report Task1 (catch) and Task II (catch-effort) data to ICCAT. On this basis some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy and SG60 is met.

Standardized CPUE time series from four longline fisheries and one bait-boat fishery are used as input in the production model and collectively are assumed to represent population trends of albacore in the North Atlantic (see Figure 3). According to the ICCAT scoreboard of data availability provided in the latest biennial report prepared by the ICCAT Secretariat (ICCAT 2019b), the score for the North Atlantic albacore was 3, where 4 is the highest score (Figure 4). Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy, and in 2013 available data supported testing of various assessment models ranging in complexity. On this basis, requirements at the SG80 level are met.

While information is sufficient for stock assessments, it is not considered comprehensive. Although widely available, environmental data are not directly used in the current harvest strategy. Information on life-history parameters such as growth, age, mortality and abundance are limited and understanding of the population dynamics of albacore tuna is incomplete. While research to address these data gaps is ongoing there are information shortfalls. On this basis gaps requirements at the SG100 level are not met.</td></tr>
</table>



ICCAT SCORECARD on fisheries data availability (preliminary)

Table #	Fishery	SCORE	Score type
1	ALB-N stock	7.04	score3
2	ALB-S stock	5.49	score3
3	ALB-M stock	1.85	score3
4	BFT-E stock (ATE region)	5.69	score3
5	BFT-E stock (MED region)	3.18	score3
6	BFT-W stock	7.89	score3
7	BET-A stock (AT + MD)	6.65	score3
8	YFT-E region	6.70	score3
9	YFT-W region	4.29	score3
10	SKJ-E stock	7.05	score3
11	SKJ-W stock	4.69	score3
12	SWO-N stock	7.62	score3
13	SWO-S stock	6.52	score3
14	SWO-M stock	3.82	score3
15	BUM-A stock (AT + MD)	4.22	score2
16	WHM-A stock (AT + MD)	4.77	score2
17	SAI-E stock	2.93	score2
18	SAI-W stock	3.64	score2
19	SPF-E stock	2.42	score2
20	SPF-W stock	3.28	score2
21	BSH-N region	3.31	score2
22	BSH-S region	3.66	score2
23	BSH-M region	0.56	score2
24	POR-N region	1.26	score2
25	POR-S region	0.83	score2
26	SMA-N region	2.55	score2
27	SMA-S region	3.30	score2

	Quartile
bad: [0, 2.5[	1
poor: [2.5, 5[	2
rasonable: [5, 7.5[	3
good: [7.5, 10[	4

LEGEND and color schemes used to show Task II (t2) availability

character	represents
a	t2ce
b	t2sz
c	t2cs

color scheme	t2 availability score

Concatenated string	represents	score3 (*)	score2 (**)
-1	no T2 data	0	0
a	t2ce only	1	1
b	t2sz only	1	1
c	t2cs only	1	1
bc	t2sz + t2cs	1	1
ab	t2ce + t2sz	2	2
ac	t2ce + t2cs	2	2
abc	all	3	2

* Species requiring ST05-T2CS data (ALB, BFT, BET, YFT, SKJ, SWO)
** Rest of the species (not requiring ST05-CAS data)

(number of years in the score)	totYears	30
(score scale adopted)	scale	10

Figure 13. ICCAT scoreboard on data availability (preliminary study) (from ICCAT 2019).

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

Stock abundance and UoA removals are sufficiently monitored at a level of accuracy and coverage to support the current harvest control rule for North Atlantic albacore tuna. CPCs are required to annually report Task1 (catch) and Task II (catch-effort) data to ICCAT, and catches and CPUE are monitored, reported, and reviewed regularly during Species Group, SCRS, and ICCAT Meetings. CPUE time series from four longline fisheries and one bait-boat fishery are used as input in the production model and assumed to represent population trends of albacore in the North Atlantic Ocean (Figure 14). All CPUEs exhibit an overall increasing trend towards the end of the time series which is consistent with the 2020 stock assessment. On this basis, requirements at the SG60 and SG80 levels are met. However, current monitoring does not include information collected from all fleets with a high degree of certainty. For example, size-at-catch information used to estimate selectivity for fisheries targeting North Atlantic albacore is not consistently collected and on this basis, SG100 is not met.

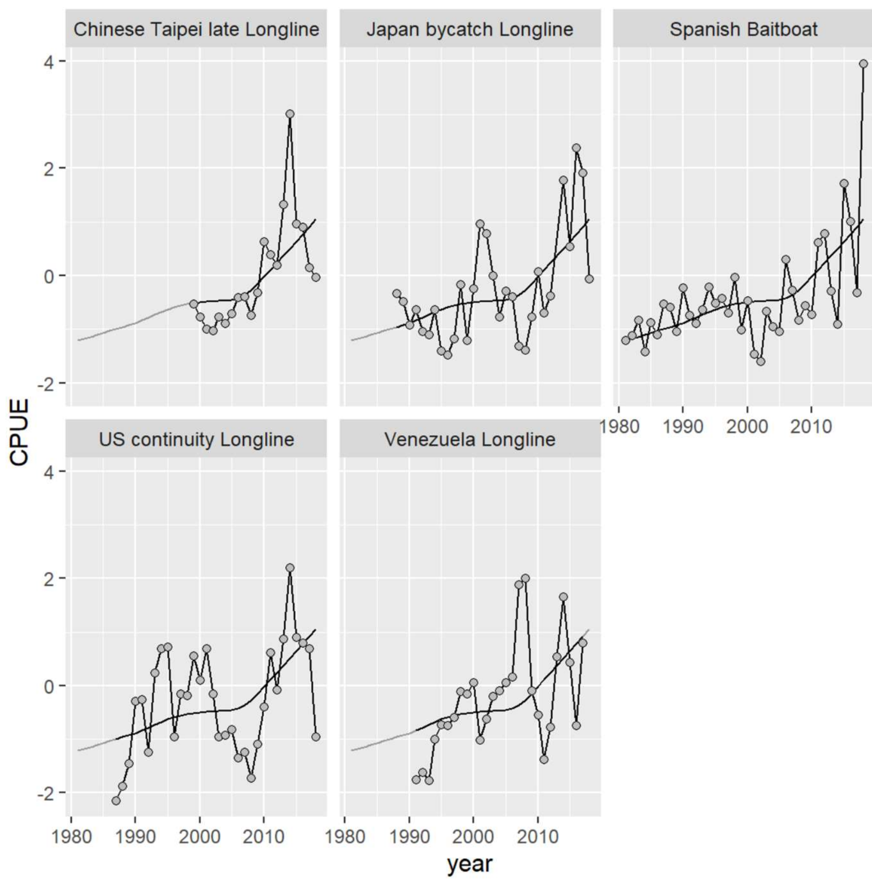


Figure 14. CPUEs (in logarithmic scale) used in the 2020 stock assessment (from ICCAT 2020).

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

Rationale

CPCs are required to annually report catch data (Task I) and catch-effort data (Task II) to ICCAT. CPCs require the collection of bycatch and discard data in their domestic scientific observer programs and logbook programs (see ICCAT Rec 11-10). No major issues regarding IUU fishing for North Atlantic albacore have been raised at ICCAT level and as mentioned above in SI(a), the ICCAT scoreboard of data availability provided in ICCAT (2019b) gives the North

Atlantic albacore stock a score of 3, where 4 is the highest score (See Figure 14 above). Based on this information the team concludes there is sufficient catch information from all other fisheries

to account for most sources of fishing mortality. On this basis, SG80 is met.

References	
ICCAT 2019, ICCAT 2020	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.4 – Assessment of stock status—Northern Stock

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				

Various stock assessment models with varying complexities (MFCL, SS3, VPA and ASPIC) have been applied in the past (ICCAT 2016). This provided a platform for testing the utility of different models to varying scenarios representing different hypotheses and characterizations of uncertainty. Results from this analysis showed that despite differences in model complexity and uncertainty the outcomes (stock status determination) were similar. On this basis the SCRS suggested that future assessment updates could be conducted using simpler models (e.g. production models) as they require minimal data compared to the more complex modelling platforms. Building on the results of the model comparison tests and recommendations of the SCRS, the 2016 stock assessment used a biomass dynamic model (BDM) to assess stock status. To assess the impacts of uncertainty and validate the model results sensitivity analyses were conducted, and despite variations in stock status all models indicated that the stock had improved and was likely in the green area of the Kobe plot. The current stock assessment has also been tested in an MSE framework and determined to be appropriate for the stock and harvest control rule. Based on this information requirements at the SG80 level are met.

Life history parameters specific to the North Atlantic albacore stock have been derived from fitting stock assessment models or other independent research and key biological parameters are outlined below:

North Stock	*Parameters*
Growth	L_∞ = 122.198cm; k = 0.21; t_0 = -1.338
	L_∞ = 124.74cm; k = 0.23; t_0 = -0.9892
Length-weight relationship	a=1.339 x 10^{-5} b=3.1066
Maturity	50% of mature fish at 90 cm (age 5)
Natural mortality	M = 0.3 per year
M at age (1 to 15)	0.63; 0.46; 0.38; 0.34; 0.31; 0.29; 0.31; 0.34; 0.38; 0.44; 0.55; 0.55; 0.55; 0.55; 0.55

Despite the availability of biological information for this stock it is not being used in the current assessment process. Successful application of the BDM modelling platform only relies on a statistical fit of catch and one or more abundance indices. The more complex models (e.g., Stock Synthesis) utilize biological data and other

fishery information to reduce underlying assumptions, which in most cases reduces uncertainty. As the assessment does not take into account major features relevant to the biology of the species SG100 is not 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				
Using the most recent fishery data, the 2020 stock assessment estimated a suite of MSY-related reference points (B_{MSY}, F_{MSY}, B_{2019}/B_{MSY}, B_{2019}/B_{Lim}, and F_{2019}/F_{MSY}) which are required for application of the HCR described in Rec. 17-04. On this basis SG60 and SG80 are 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				
ICCAT assessments provide management advice and stock status determinations in the form of risk that accounts for uncertainty, and stock status metrics are presented with confidence intervals. Significant testing of the assessment model has occurred to advance model structure and address uncertainty. Prior to the 2016 stock assessment input data were reviewed and rectified as needed. In the 2016 assessment, five CPUE time series (four longline and one bait-boat) that represent the overall trend in population size were used in the assessment; in the base case scenario equal weighting was applied to each series. As part of the assessment several sensitivity analyses were conducted based on choice of model parameterization and CPUE indices, including considering a logistic production function, the information content of the data (i.e., length of the catch time series (truncated at 1975), and the impact of dropping one of the five CPUE indices at a time. The sensitivity analyses did not show strong deviations from the base case scenario, and all models predicted the stock to be in the green quadrant in the Kobe plot. The 2020 stock assessment used the same model structure and approach as the 2016 assessment with updated catch an effort information. Based on results from the 2020 assessment, the probability that the stock is not overfished and not undergoing overfishing ($F<F_{MSY}$ and $B>B_{MSY}$) is 98.4%, and the probability that the stock is being overfished (B<BMSY) is 1.6%, and the probability that it is being overfished and undergoing overfishing ($F>F_{MSY}$ and $B<B_{MSY}$) is 0%. While stock status determinations are explicitly probabilistic, they are based on bootstrapping which only accounts for observation error. Despite this concern, the team does not consider this to be an issue in the scoring. Based on this information major sources of uncertainty are identified, and the assessment takes into account uncertainty; SG60 and SG80 are met.				

Decision tables evaluating stock status relative to reference points in the terminal year of the assessment are presented in a probabilistic way, as well as the consequences to stock status resulting from various TAC levels. Uncertainty has also been explicitly considered in assessments throughout the MSE process when developing the HCR and determining reference points. Thus, clear evidence exists that the assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way for management decision making; 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				
Various stock assessment models with varying complexities (MFCL, SS3, VPA and ASPIC) have been applied in the past (ICCAT 2016). This provided a platform for testing the utility of different models to varying scenarios representing different hypotheses and characterizations of uncertainty. The results showed that although the range of estimated management benchmarks was relatively wide, most models were in agreement on stock status. The SCRS suggested that future assessment updates could be conducted using simpler models (e.g. production models) as they require minimal data compared to the more complex modelling platforms. Building on the results of the model comparison tests and recommendations of the SCRS, the 2016 and 2020 stock assessments used a biomass dynamic model (BDM) to assess stock status (ICCAT 2016, ICCAT 2020). MSE testing has shown that advice should be robust to a wide range of uncertainties. Considering the many alternative assessment approaches and hypotheses considered in the past, SG100 is met.				
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				
ICCAT stock assessment are subject to internal review through a working group process and also by the SCRS which meets annually to review models, data and research on key tuna species, including North Atlantic albacore; this meets SG80. There is no evidence that the stock assessment was externally reviewed, so SG100 is not met. We note that a review of the MSE algorithms was conducted in 2018 but this does not constitute a review of the stock assessment (Scully, 2018).				
References				
Scully (2018), ICCAT (2016), ICCAT (2020)				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	More information is sought as to whether an external review of the 2016 assessment was conducted.
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.1.1 – Stock Status—Southern Stock

<table>
<tr><td colspan="2">PI 1.1.1</td><td colspan="3">The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Stock status relative to recruitment impairment</td></tr>
<tr><td>Guide post</td><td>It is likely that the stock is above the point where recruitment would be impaired (PRI).</td><td>It is highly likely that the stock is above the PRI.</td><td>There is a high degree of certainty that the stock is above the PRI.</td></tr>
<tr><td>Met?</td><td>Yes</td><td>Yes</td><td>Yes</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">ICCAT regularly assess the status of South Atlantic albacore tuna and the latest assessment was conducted in 2020 using data until 2018 and the same production modelling procedures as in 2016 (ICCAT 2020). The southern stock is exploited by surface fisheries targeting mainly immature and sub-adult fish (70 cm to 90 cm FL) and longline fisheries targeting immature and adult albacore (60 cm to 120 cm FL). The southern stock is largely exploited by five fisheries; surface bait-boat fleets of South Africa and Namibia operating seasonally from October to May when albacore is available in coastal waters and the longline fleets of Taiwan, Brazil, and Japan. The Taiwan fleet is the largest and operates throughout the year.

Three longline CPUE indices were used in the production model to determine stock status, including those from Taiwan, Japan (late time frame), and Uruguay (see Figure 8). The Taiwan CPUE series is the longest and the only index that informed stock trends in recent years. Standardized CPUE series from the Brazilian longline (2002-2018) and the South African bait-boat fishery were made available and used for sensitivity analyses.

Stock status determinations in 2020 were initially conducted using two production models formulations (ASPIC and JABBA), and all results and conclusions based on converged model runs. After extensive testing the SCRS selected JABBA as the base case model that best represents the population dynamics of albacore and uncertainty around stock status, as well as impact of alternative fishing scenarios. The SCRS further recommended that all management advice be based on the JABBA base case model results, including the projections, and estimated Kobe probability matrices.

The 2020 South Atlantic albacore stock assessment estimated MSY at 27,264 t (95% CI 23,734 - 31,567) and B_{MSY} as 124,453 t (95% CI 79,611-223-424) (see Table 10). The results show B_{2018}/B_{MSY} is 1.58 (95% CI 1.14-2.05) and F_{2018}/F_{MSY} was 0.40 (95% CI 0.28-0.59). The probability of the stock currently being in the green area of the Kobe plot (not overfished and not undergoing overfishing, $F<F_{MSY}$ and $B>B_{MSY}$ is 99.4% while the probability of being in the yellow area (overfished, $B<B_{MSY}$) is 0.6%. The probability of being in the red area (overfished and undergoing overfishing, F>FMSY and $B<B_{MSY}$) is 0% (see Figure 9). Based on the results of the 2020 stock assessment, South Atlantic albacore tuna are not overfished and are not subject to overfishing.

As $B_{MSY}<40\%B_0$ the PRI for the South Atlantic albacore stock is set at the MSC default value of $20\%B_0$, which is equivalent to $54\%B_{MSY}$ (following GSA2.2.3.1). Noting biomass at MSY in 2018 was estimated at $158\%B_{MSY}$ for the base case assessment model and reported catches in 2019 (15,640 t) are significantly below the TAC of 24,000 t, as well as below the lower 95% CI for MSY, there is a high degree of certainty that the stock is above the PRI. Based on this information SG 100 is met.</td></tr>
<tr><td>b</td><td colspan="4">Stock status in relation to achievement of Maximum Sustainable Yield (MSY)</td></tr>
</table>

	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

Based on the 2020 stock assessment, the median estimate of stock size specifies that B_{2018}/B_{MSY} =1.58 (95% CI 1.14–2.05) and F_{2018}/F_{MSY} was 0.40 (95% CI = 0.28-0.59). Reported catches have been consistently less than the estimated B_{MSY} value of 27,264 t (95% CI = 23,734-31,567) since 2004, and less than the TAC since 2013. The reported low catches relative to the TAC have contributed to stock recovery and the current biomass is currently above B_{MSY} and current fishing mortality significantly less than F_{MSY} (ICCAT 2020). On this basis SG80 is met.

Noting that the lower bound on the current biomass (141,876 t) is above the B_{MSY} estimate (124,453 t) and that biomass has been consistently at or above B_{MSY} since 2010 there is a high degree of certainty that the stock has been fluctuating around a level consistent with B_{MSY} or has been above this level over recent years. On this basis SG100 is met.

References

ICCAT 2020.

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)	Default PRI	$B_{CURRENT}$ = 54%B_{MSY}	B_{2018} = 158%B_{MSY}
Reference point used in scoring stock relative to MSY (SIb)	$B_{MSY}F_{MSY}$	$B_{CURRENT}/B_{MSY}$ $F_{CURRENT}/F_{MSY}$	B_{2018}/B_{MSY} = 1.58 (95% CI = 1.14-2.05). F_{2018}/F_{MSY}= 0.40 (95% CI = 0.281-0.59)

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Documentation specifying limit and target reference points is requested.

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.1.2 – Stock rebuilding—Southern Stock

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?	Not scored		Not scored
Rationale				
There is no rebuilding plan.				
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?	Not scored	Not scored	Not scored
Rationale				
There is no rebuilding plan.				
References				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				

Draft scoring range	Not scored
Information gap indicator	
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.1 – Harvest strategy—Southern Stock

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	Yes	No
Rationale				
The MSC defines a harvest strategy as a combination of monitoring, stock assessment, HCRs, and management measures working together to achieve the management objective. South Atlantic albacore are routinely assessed by ICCAT, CPCs are required to annually submit catch and effort information to the ICCAT, and at-sea information is collected through observer programs and from logbooks. The preamble of the ICCAT Convention, finalized in 1966, delineates its objective by stating: “The Governments (…) considering their mutual interest in the populations of tuna and tuna-like fishes found in the Atlantic Ocean, and desiring to cooperate in maintaining the populations of these fishes at levels which will permit the maximum sustainable catch for food and other purposes”. Therefore, ICCAT’s objective is to maintain populations of tunas and tuna-like fishes at levels that allows for maximum sustainable yield (MSY). On this basis SG60 is met. With adoption and implementation of ICCAT Rec. 11-13, those stocks determined to be overfished and subject to overfishing the Commission is mandated to immediately adopt management measures designed to result in a high probability of ending overfishing and rebuild the stock in as short a period as possible, subject to scientific information and advice (feedback). The current strategy is to adopt an agreed upon TAC that limits catches to sustainable levels based on scientific advice that evaluates, and addresses, changing circumstances. To ensure compliance with established conservation objectives (there is a 60% probability that the biomass will be in the “green zone” of the Kobe plot) the TAC is set at the median level which has been shown to be effective in meeting the objective. While the 2016 performance review indicated that the established TAC was not consistent with scientific advice from the SCRS, it did seem consistent with the 2017 advice from SCRS (ICCAT 2019). The 2020 assessment determined that South Atlantic albacore stock is not overfished or experiencing overfishing, and there is a 99.4% probability that biomass is in the green quadrant of the Kobe plot. Based on this information the strategy is responsive to the status of the stock and SG80 is met. While the harvest strategy is responsive to the state of the stock it is focused only on catch. A harvest strategy that explicitly accounts for other potential conservation metrics (e.g., fishing mortality) in the context of a well-defined harvest control rule has yet to be established for this stock. On this basis SG100 is not met.				
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	No
Rationale				
Based on results of the latest stock assessment of South Atlantic albacore the stock has recovered, providing evidence that the harvest strategy has worked. Furthermore, ICCAT has adjusted the TAC when necessary based on scientific advice. Monitoring of the stock is in place and evidence indicates the harvest strategy is achieving established objectives. On this basis SG60 and SG80 are met. While the stock is not overfished or experiencing overfishing, much of this owes to catches being well below the TAC, suggesting that the procedure to establish a TAC may not be appropriate. Additionally, there are no pre-agreed activities to implement when reacting to stock changes. Furthermore, the harvest strategy has not been fully evaluated in the context of an MSE framework. On this basis 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				
Monitoring is in place to determine if the harvest strategy is working. Catches and CPUE are monitored and reported on a yearly basis as CPCs are obligated to annually report data to ICCAT; catch data (Task I) and catch-effort (Task II). The data are reviewed annually during the species group meeting, the SCRS meeting, and the Commission meeting. TACs are established to maintain fishing mortality at or below F_{MSY} and biomass above or around B_{MSY}. Benchmark South Atlantic albacore stock assessments are conducted every 3 years, to assess stock status. On this basis monitoring is in place that is expected to determine whether the harvest strategy is working; SG60 is met.				
d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			No
Rationale				

Although the harvest strategy is reasonable, the assessment team has not been provided with evidence of any formal review of the strategy and information on suggested improvements. Improvements to the harvest control rule and management procedures for the North Atlantic albacore stock have been identified and implemented conducted through use of MSE research, but such research has not been applied to the South Atlantic albacore stock. On this basis SG100 is not 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?	NA	NA	NA
Rationale				
This is not applicable as sharks are not targeted.				
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				
The fishing gear used by the UoA (longline) is selective, the size of fish caught depending on hook size. Based on logbook records for the UoA approximately 0.001% of the South Atlantic albacore catch is discarded annually. The mortality caused by the UoA on the South Atlantic albacore stock due to the unwanted catches is considered negligible, since stock biomass has been steadily increasing since approximately 2005 (ICCAT 2020). Consistent with GSA3.5.3 the Assessment Team considers the unwanted catch to be negligible and therefore this Si is not scored.				
References				
ICCAT (2019), ICCAT (2020)				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	

	Information as to whether the harvest strategy is periodically reviewed and improved as necessary.
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.2 – Harvest control rules and tools—Southern Stock

<table>
<tr><td colspan="2">PI 1.2.2</td><td colspan="3">There are well defined and effective harvest control rules (HCRs) in place</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">HCRs design and application</td></tr>
<tr><td>Guide post</td><td>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.</td><td>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.</td><td>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.</td></tr>
<tr><td>Met?</td><td>Yes</td><td>No</td><td>Not scored</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">Scientific advice and management response has been to maintain the South Atlantic albacore stock at or above MSY by ensuring fishing mortality remains at or below F_{MSY} and this has been achieved through adjustments to the TAC and implementation of annual catch limits as specified in ICCAT Rec. 16-07. Hence, the “generally understood” HCR is to set catches low enough that the stock rebuilds to B_{MSY}, and sets future catches (TACs) such that the stock remains at this level. Decision tables evaluating stock status relative to reference points (B_{MSY}) in the terminal year of the assessment are presented in a probabilistic way, as well as the consequences to stock status resulting from various TAC levels. Thus, ensuring that stocks are maintained well above the PRI. On this basis a generally understood HCR is in place and SG60 is met.

While there is no well-defined harvest control rule that specifies an exploitation rate that is a monotonically decreasing function of stock size, GSA 2.5 states that “any exploitation rate function may be acceptable so long as it acts to keep the stock above a limit reference point that avoids possible recruitment failure and attempts to maintain the stock at a target reference point that is consistent with B_{MSY} or a similar highly productive level.”

As previously stated, the scientific advice and management response in ICCAT has been successful in maintaining the South Atlantic albacore stock at or above MSY through the establishment of TACs. However, it is unclear what specific action(s) would be taken when the stock falls below MSY or approaches PRI. Also, sufficient testing of the HCR has not occurred (e.g., MSE analyses), as there is only a generally understood HCR in place. Fixed catches (TACs) and their probability of maintaining the stock at MSY have been tested using projection scenarios, but it is unclear how uncertainty is modelled in the projections. Based on this information the Assessment Team does not consider there to be well defined HCRs in place that ensure that the exploitation rate is reduced as the PRI is approached; SG80 is not met.

SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).</td></tr>
<tr><td>b</td><td colspan="4">HCRs robustness to uncertainty</td></tr>
</table>

	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 robustness of the HCR is tested for various fixed catches and fishing mortality and reported as probabilistic outcomes (ICCAT 2020). While this may suffice given the objective of the HCR, the SCRS notes that important uncertainties remain in the biology, fisheries and modelling of Atlantic albacore, all of which have not been evaluated. As noted in the recent assessment report (ICCAT 2020) “there is still a level of the real uncertainty that is not reflected in the model(s) results, and that the management advice provided should be taken with caution. The Group raised concerns about recent catches of southern albacore (2017-2018) having been below (~ 60%) the TAC advice provided (Rec. 16-07, 24,000 t). It is important to understand if this is related to capacity, catchability, or if is indicative of stock abundance levels inconsistent with stock assessment results.” The Assessment Team considers these uncertainties to be main and on this basis SG80 is not met. SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).				
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				
The current level of control occurs through establishment of agreed upon TACs which has led to recovery of the South Atlantic albacore stock to B_{MSY}. There is also some evidence that adjustments to the TAC in response to scientific findings has occurred, and that a lower TAC will be effective in decreasing mortality. Based on the 2020 stock assessment the median estimate of stock size specifies that B_{2018}/B_{MSY} =1.58 and F_{2018}/F_{MSY} was 0.40 (ICCAT 2020). As the objective is to maintain stock biomass at B_{MSY} levels or above through reductions in exploitation some evidence is available indicating that the tool in use (TAC setting) is appropriate and effective. On this basis SG 60 is met. While ICCAT has been successful in maintaining the South Atlantic albacore stock at or above MSY through the establishment of TACs, there is no available evidence that the use of this tool (setting a TAC) in practice would reduce catch at or below F_{MSY} since catches have been well below the TAC. Also, as “carrying forward” uncaught catch allocations are an allowable practice it is unclear how this source of fishing mortality would be accounted for when setting the TAC. On this basis SG80 is not met.				

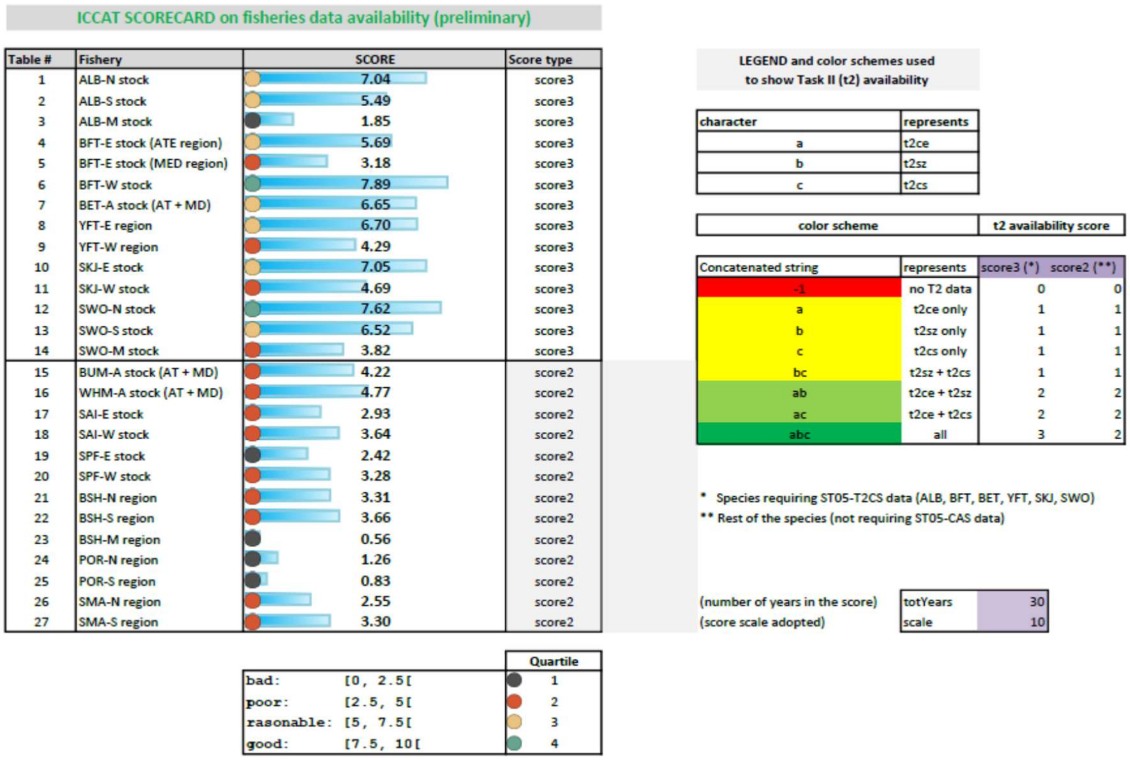
SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).	
References	
ICCAT 2016, ICCAT 2020	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	60-79
Information gap indicator	Provide available research plans for HCR and MSE develop for the South Atlantic albacore stock.
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.3 – Information and monitoring—Southern Stock

<table>
<tr><td colspan="2">PI 1.2.3</td><td colspan="3">Relevant information is collected to support the harvest strategy</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Range of information</td></tr>
<tr><td>Guide post</td><td>Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.</td><td>Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.</td><td>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.</td></tr>
<tr><td>Met?</td><td>Yes</td><td>Yes</td><td>No</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">There is adequate information to determine whether the harvest strategy is working. Catches and CPUE are monitored and reported on a yearly basis as CPCs are obligated to annually report data to ICCAT; catch data (Task I) and catch-effort (Task II). The data are reviewed annually during the species group meeting, the SCRS meeting, and the Commission meeting. Thus, some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy and SG60 is met.

Standardized CPUE time series from three longline fisheries are used as input in the assessment models and collectively are assumed to represent population trends of the South Atlantic albacore stock (see Figure 14). According to the ICCAT scoreboard of data availability provided in the latest biennial report prepared by the ICCAT Secretariat (ICCAT 2019), the score for the South Atlantic albacore was 3, where 4 is the highest score (Figure 15). Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy, and allow for stock assessment to be completed, SG80 is met.

While information is sufficient for stock assessment, it is not comprehensive. There is considerable environmental data not directly used in the current harvest strategy. Also, life-history data on growth, age, mortality and abundance are limited and understanding of the population dynamics of albacore tuna is incomplete. Improvements are being made in this regard, but since gaps in relevant biological information persist, the requirements for SG100 are not met.</td></tr>
</table>



ICCAT SCORECARD on fisheries data availability (preliminary)

Table #	Fishery	SCORE	Score type
1	ALB-N stock	7.04	score3
2	ALB-S stock	5.49	score3
3	ALB-M stock	1.85	score3
4	BFT-E stock (ATE region)	5.69	score3
5	BFT-E stock (MED region)	3.18	score3
6	BFT-W stock	7.89	score3
7	BET-A stock (AT + MD)	6.65	score3
8	YFT-E region	6.70	score3
9	YFT-W region	4.29	score3
10	SKJ-E stock	7.05	score3
11	SKJ-W stock	4.69	score3
12	SWO-N stock	7.62	score3
13	SWO-S stock	6.52	score3
14	SWO-M stock	3.82	score3
15	BUM-A stock (AT + MD)	4.22	score2
16	WHM-A stock (AT + MD)	4.77	score2
17	SAI-E stock	2.93	score2
18	SAI-W stock	3.64	score2
19	SPF-E stock	2.42	score2
20	SPF-W stock	3.28	score2
21	BSH-N region	3.31	score2
22	BSH-S region	3.66	score2
23	BSH-M region	0.56	score2
24	POR-N region	1.26	score2
25	POR-S region	0.83	score2
26	SMA-N region	2.55	score2
27	SMA-S region	3.30	score2

		Quartile
bad:	[0, 2.5[	1
poor:	[2.5, 5[	2
rasonable:	[5, 7.5[	3
good:	[7.5, 10[	4

LEGEND and color schemes used to show Task II (t2) availability

character	represents
a	t2ce
b	t2sz
c	t2cs

color scheme	t2 availability score	

Concatenated string	represents	score3 (*)	score2 (**)
-1	no T2 data	0	0
a	t2ce only	1	1
b	t2sz only	1	1
c	t2cs only	1	1
bc	t2sz + t2cs	1	1
ab	t2ce + t2sz	2	2
ac	t2ce + t2cs	2	2
abc	all	3	2

* Species requiring ST05-T2CS data (ALB, BFT, BET, YFT, SKJ, SWO)

** Rest of the species (not requiring ST05-CAS data)

(number of years in the score)	totYears	30
(score scale adopted)	scale	10

Figure 15. ICCAT scoreboard on data availability (preliminary study). (from ICCAT 2019b).

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				

Stock abundance and UoA removals are sufficiently monitored at a level of accuracy and coverage to support the current harvest control rule for South Atlantic albacore tuna. CPCs are required to annually report Task1 (catch) and Task II (catch-effort) data to ICCAT, and catches and CPUE are monitored, reported, and reviewed regularly during Species Group, SCRS, and ICCAT Meetings. CPUE time series from three longline fisheries are used as input in the stock assessment models and collectively assumed to represent population trends of albacore in the South Atlantic Ocean (see Figure 14). All CPUEs exhibit an overall increasing trend towards the end of the time series which is consistent with the 2020 stock assessment. On this basis, requirements at the

SG60 and SG80 levels are met. However, current monitoring does not include information collected from all fleets with a high degree of certainty. For example, size-at-catch information used to estimate selectivity for fisheries targeting South Atlantic albacore is not consistently collected. Also, not collecting information from all fisheries harvesting albacore tuna could affect monitoring of the TAC as well as elements of the stock assessment (e.g., catchability) that impact its robustness. On this basis, SG100 is not met.

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

Rationale

CPCs are required to annually report catch data (Task I) and catch-effort data (Task II) to IACCAT. CPCs require the collection of bycatch and discard data in their domestic scientific observer programs and logbook programs (ICCAT 2011, Rec 11-10). No major issues regarding IUU fishing for South Atlantic albacore have been raised at ICCAT and as noted above in SI(a), the ICCAT scoreboard of data availability provided in ICCAT (2019) gives the South Atlantic albacore stock a score of 3, where 4 is the highest score (See Figure 15 above). Additionally, ICCAT routinely provides a catalogue of available catch data (Task 1 and Task 2) and 90% of the total yield is linked to only five major fleets (Taiwan longline, South Africa and Namibia bait-boat, Brazil longline, and Japan longline) (Table 17). The remaining 10% comes from small longline and surface fisheries operating throughout the South Atlantic Ocean. Based on this information the Assessment Team concludes there is sufficient information on removals from on all other fisheries to account for most sources of fishing mortality. On this basis SG80 is met.

Table 17. South Atlantic albacore stock standard SCRS catalogue on Task 1/2 data availability by major fishery (flag/gear combinations ranked by order of importance) and year (1989 to 2018). Only the most important fisheries (representing ~95% of Task 1 total catches) are shown (from ICCAT 2020).

Species	Stock	Status	FlagName	GearGrp	DSet	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Rank	%	%cum
				T1NC Total		27212	28714	26016	36562	32813	35300	27552	28426	28022	30595	27656	31387	38796	31746	28005	22545	18916	24453	20283	18867	22265	19225	24129	25282	19457	13702	15199	14336	13825	17098			
ALB	ATS	NCC	Chinese Taipei	LL	t1	18386	20442	19883	23063	19400	22573	18351	18956	18165	16106	17377	17221	15833	17321	17351	13288	10730	12293	13146	9966	8678	10975	13032	12813	8519	6675	7157	8907	9090	9227	1	58.1%	58%
ALB	ATS	NCC	Chinese Taipei	LL	t2	ab	ab	ab	ab	ab	ab	ab	ab	abc	abc	abc	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	abc	abc	abc	abc	1		
ALB	ATS	CP	South Africa	BB	t1	6834	5220	3355	6306	6845	6842	5204	5425	6581	8401	5010	3463	6715	6057	3323	4153	2856	3365	2024	2334	2967	2446	2029	3466	3395	3620	3898	2001	1640	2353	2	17.1%	75%
ALB	ATS	CP	South Africa	BB	t2	ab	ab	ab	ab	ab	ab	ab	ab	ab	b	ab	abc	ab	abc	abc	abc	abc	ab	ab	ab	a	a	ab	ab	ab	ab	ab	ab	a	a	2		
ALB	ATS	CP	Namibia	BB	t1						915	950	982	1192	1422	1072	2240	2969	2858	2432	3079	2031	2426	1058	1856	4936	1263	3711	2275	838	1016	1008	893	205	874	3	5.9%	81%
ALB	ATS	CP	Namibia	BB	t2						abc	abc	-1	-1	-1	abc	c	ab	ac	-1	abc	abc	abc	abc	abc	abc	abc	abc	ab	abc	abc	ab	abc	abc	abc	3		
ALB	ATS	CP	Brazil	LL	t1	433	485	1095	2710	3600	835	723	807	589	3013	1478	3758	6240	2865	1844	285	359	267	222	233	150	207	920	824	778	326	431	494	383	311	4	4.9%	86%
ALB	ATS	CP	Brazil	LL	t2	a	a	a	ab	ab	ab	ab	a	ab	ab	ab	ab	a	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	a	a	a	a	a	ab	4		
ALB	ATS	CP	Japan	LL	t1	450	587	654	583	467	651	389	435	424	418	601	554	341	231	322	509	312	316	238	1370	921	973	1194	2903	3106	1131	1752	1096	1189	2985	5	3.6%	90%
ALB	ATS	CP	Japan	LL	t2	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ac	abc	abc	abc	abc	abc	abc	ab	ab	ab	ab	ab	ab	ab	5		
ALB	ATS	CP	South Africa	RR	t1	56	60	55	54	36	89	10	209	127		73	58	377	323	82	201	288	324	1696	1028	1855	1529	1268								6	1.3%	91%
ALB	ATS	CP	South Africa	RR	t2	a	a	a	a	a	a	-1	a	a		-1	-1	-1	-1	-1	-1	a	a	a	a	a	a	-1								6		
ALB	ATS	CP	EU.España	LL	t1		0	1	127	135	149	202	180	190	20	871	282	573	829	183	81	261	358	758	908	997	266	250	235	369	256	354	195	259	301	7	1.3%	92%
ALB	ATS	CP	EU.España	LL	t2		ab	ab	ab	-1	ab	ab	ab	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	b	b	b	b	b	7		
ALB	ATS	CP	St. Vincent and Grenadines	LL	t1												2116	4292	44				65	160	71	51	31	94	92	97	110	100	107	101	98	8	1.0%	93%
ALB	ATS	CP	St. Vincent and Grenadines	LL	t2												-1	-1	a		a		a	a	a	a	a	a	-1	ab	a	ab	ab	ab	ab	8		
ALB	ATS	CP	Brazil	BB	t1	2	29	18		13	392	200	12	63	405	394	627	619	363	803	235	197	85	293	156	18	34	198	1190	979	129	60	55	0	1	9	1.0%	94%
ALB	ATS	CP	Brazil	BB	t2	a	a	a		a	-1	a	a	a	a	a	-1	a	a	a	a	a	a	ab	a	a	a	a	a	a	a	a	a	a	a	9		
ALB	ATS	CP	EU.Portugal	BB	t1	557	732	81	184	483	1185	655	494	256	124	232	486	40	433	415	9															10	0.9%	95%
ALB	ATS	CP	EU.Portugal	BB	t2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	a	a	a	a															10		
ALB	ATS	CP	Namibia	LL	t1						196			7	7	90	178	450	105	721	250	313	2674	138	102	0	57	80	145	10	41	54	101	8	14	11	0.8%	96%
ALB	ATS	CP	Namibia	LL	t2						a			-1	-1	a	-1	ab	ac	-1	ab	ab	ab	ab	a	ab	ab	abc	a	ab	a	a	a	a	abc	11		
ALB	ATS	CP	EU.España	PS	t1			279	1816	648	682	255	4	66	173	156	7		7	193		24	9		25	64	28	64	116		3	64		88	2	12	0.6%	97%
ALB	ATS	CP	EU.España	PS	t2	b	b	abc	abc	abc	abc	abc	abc	abc	abc	ac	abc	abc	abc	abc		abc	abc		abc	abc	abc	abc	abc	b	ac	ac		abc	a	12		

References

ICCAT 2019, ICCAT 2020

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.4 – Assessment of stock status—Southern Stock

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

Various stock assessment models with varying complexities (MFCL, SS3, VPA and ASPIC) have been applied in the past (ICCAT 2016). This provided a platform for testing the utility of different models to varying scenarios representing different hypotheses and characterizations of uncertainty. Results from this analysis showed that despite differences in model complexity and uncertainty the outcomes (stock status determination) were generally similar. On this basis the SCRS suggested that future assessment updates could be conducted using simpler models (e.g., production models) as they require minimal data compared to the more complex modelling platforms. Building on the results of the model comparison tests and recommendations of the SCRS, the 2016 and 2020 stock assessments used a biomass dynamic model (BDM) to assess stock status. To assess the impacts of uncertainty and validate the model results sensitivity analyses were conducted, and despite variations in stock status all models indicated that the stock had improved and was likely in the green area of the Kobe plot. The 2020 stock assessment determined there is a 99.4% chance that biomass of the South Atlantic albacore stock is in the green quadrant of the Kobe plot. Output from the assessment is used to determine the need for management measures to ensure stock biomass remains at or above MSY, as well as determination of TACs, and the frequency of assessments (3-year cycle) is consistent with the HCR. Based on this information requirements at the SG80 level are met.

Life history parameters specific to the South Atlantic albacore stock have been derived from fitting stock assessment models or other independent research and key biological parameters are outlined below (from ICCAT 2020):

South Stock	*Parameters*
Growth	L_∞ = 147.5 cm; k = 0.209; and t_0 = - 1.89
Length-weight relationship	a=1.3718 x^{-5} b=3.0973
Maturity	50% of mature fish at 90 cm (age 5)
Natural mortality	*M* = 0.3 per year

Despite the availability of biological information for this stock it is not being used in the current assessment process. Successful application of the BDM modelling platform only relies on a statistical fit of catch and one or more abundance indices. The more complex models (e.g., Stock Synthesis) utilize biological data and other

fishery information to reduce underlying assumptions, which in most cases reduces uncertainty. As the assessment does not consider major features relevant to the biology of the species SG100 is not 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				
Using the most recent fishery data, the 2020 stock assessment estimated a suite of MSY-related reference points (B_{MSY}, F_{MSY}, B_{2018}/B_{MSY}, and F_{2018}/F_{MSY}) which are required to determine stock status (ICCAT 2020). On this basis SG60 and SG80 are 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				
ICCAT assessments provide management advice and stock status determinations in the form of risk that accounts for uncertainty, and stock status metrics are presented with confidence intervals. Significant testing of the assessment model has occurred to advance model structure and address uncertainty. Prior to the 2016 stock assessment input data were reviewed and rectified as needed. In the 2016 assessment, three longline CPUE time series that represent the overall trend in population size were used in the assessment. As part of the assessment several sensitivity analyses were conducted based on choice of model parameterization and CPUE indices. The sensitivity analyses did not show strong deviations from the base case scenario, and all models predicted the stock to be in the green quadrant in the Kobe plot. The 2020 stock assessment used the same model structure and approach as the 2016 assessment with updated catch an effort information. Based on results from the 2020 assessment, the probability that the stock is not overfished and not undergoing overfishing (F<FMSY and B>BMSY) is 99.4%, and the probability that the stock is being overfished (B<BMSY) is 0.6%, and the probability that it is being overfished and undergoing overfishing (F>FMSY and B<BMSY) is 0% (ICCAT 2020). While stock status determinations are explicitly probabilistic, they are based on bootstrapping which only accounts for observation error. Despite this concern, the team does not consider this to be an issue in the scoring. Based on this information major sources of uncertainty are identified, and the assessment takes into account uncertainty; SG60 and SG80 are met. Decision tables evaluating stock status relative to reference points in the terminal year of the assessment are presented in a probabilistic way, as well as the consequences to stock status resulting from various TAC levels.				

Thus, clear evidence exists that the assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way for management decision making; 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?			No
Rationale				
While the assessment has been tested and shown to be robust, alternative hypotheses and assessment approaches have not been rigorously explored. Production models are one of the simplest assessment tools and do not require biological data or other information about the fishery as input. Life history information (e.g., size and age) and information to determine the extent of spatial structuring in the stock, both of which could influence CPUE, are available but are not being used. Oceanographic conditions are known to influence the abundance, availability, and distribution of albacore, and while these data are available, they are not integrated into current assessment models. The SCRS has identified this as a recommendation for future assessments (ICCAT 2016). Also, no MSE has been conducted despite its utility in identifying robust reference points and HCRs. On this basis SG100 is not met.				
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				
ICCAT stock assessments are subject to internal review through a working group process, and also by the SCRS and ICCAT Commission which meets annually to review models, data and research on key tuna species, including South Atlantic albacore; this meets SG80. There is no evidence that the 2016 or 2020 stock assessments were externally reviewed, so SG100 is not met.				
References				
ICCAT 2016, ICCAT 2020				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information is sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

4.3 Principle 2

4.3.1 Principle 2 background

4.3.1.1 Overview of Non-target Catch

All species that are affected by the fishery and that are not part of the Unit of Certification are considered under Principle 2. This includes species that are retained for sale or personal use (assessed under Performance Indicator 2.1), bycatch species that are discarded (Performance Indicator 2.2), and species that are considered endangered, threatened, or protected by the government in question or are listed by the Convention of International Trade of Endangered Species (CITES) (Performance Indicator 2.3). This section contains an evaluation of the total impact of the fishery on all components in P2 and includes both observed and unobserved fishing mortality. Unobserved mortality may occur from illegal, unregulated, or unreported (IUU) fishing, biota that are injured and subsequently die as a result of coming in contact with fishing gear, ghost fishing, waste, or biota that are stressed and die as a result of attempting to avoid being caught by fishing gear. This section also considers impacts on marine habitats (Performance Indicator 2.4) and the ecosystem more broadly (Performance Indicator 2.5).

Primary species

For the purposes of an MSC evaluation, primary species are those in the catch, and within the scope of the MSC program (fishes or shellfish), and not defined by the client as the target – which is evaluated under Principle 1. Primary species will usually be species of commercial value to either the UoA or fisheries outside the UoA, with management tools controlling exploitation as well as known reference points in place. In addition, the institution or arrangement that manages the species (or its local stock) will usually have some overlap in a jurisdiction with the UoA fishery.

Secondary species

Secondary species include fish and shellfish species that are **not** managed according to reference points. Secondary species are also considered to be all species that are out of the scope of the standard (birds/ mammals/ reptiles/ amphibians) and that are not ETP species. These types of species could in some cases be landed intentionally to be used either as bait or as food for the crew or for other subsistence uses but may also in some cases represent incidental catches that are undesired but somewhat unavoidable in the fishery. Given the often-unmanaged status of these species, there are unlikely to be reference points for biomass or fishing mortality in place, as well as a general lack of data availability.

Main species

For Primary and Secondary species, species may be considered "Main" based on either resilience/vulnerability or catch volume. Species that are not "Main" are Minor. Main and Minor species must meet different Performance Indicators (PIs) in P2.

- **Resilience/vulnerability:** If the species is considered "less resilient" (as defined in SA3.4.2.2) and it is ≥ 2% of the catch, then it is considered Main, otherwise it is considered Minor.
- **Catch volume:** If the species is not considered "less resilient" and it is ≥ 5% of the catch, then it is considered Main, otherwise, it is considered Minor.

ETP Species

SA3.1.5
The team shall assign ETP (endangered, threatened or protected) species as follows:

- SA3.1.5.1
  Species that are recognised by national ETP legislation;
- SA3.1.5.2

  Species listed in the binding international agreements given below:
  a) Appendix 1 of the Convention on International Trade in Endangered Species (CITES), unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered.
  b) Binding agreements concluded under the Convention on Migratory Species (CMS), including:
     i. Annex 1 of the Agreement on Conservation of Albatross and Petrels (ACAP);
     ii. Table 1 Column A of the African-Eurasian Migratory Waterbird Agreement (AEWA);
     iii. Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS);
     iv. Annex 1, Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS);
     v. Wadden Sea Seals Agreement; or
     vi. Any other binding agreements that list relevant ETP species concluded under this Convention.

4.3.1.2 Overview of Species Classification

UoA observer data and logbook data were used to analyze catch composition and classify species. North and South Atlantic catch areas were evaluated separately. Based on the provided data, in the South Atlantic, albacore represented the largest portion of the catch, followed by Bali sardinella (*Sardinella lemuru*) and Indian oil sardine (*Sardinella longiceps*) as bait species (main secondary) (Table 18, Table 19). Blue shark (*Prionus glauca*), a main primary species in both UoAs, was evaluated at a 2% catch composition threshold, given the vulnerable life-history of the species. Observer data in the North Atlantic had bigeye (*Thunnus obesus*) tuna as the dominate species, though logbook data showed albacore as the main species captured.

ETP interactions were reported in observer data and logbook information (Table 22, Table 23). There were limited ETP interactions reported in the North Atlantic (both logbook and observer data) but more in the South Atlantic. The main species groups were seabirds (not reported at the species level in logbooks), bigeye thresher sharks (*Alopias superciliosus*), sea turtles (loggerhead, *Caretta caretta*; leatherback, *Dermochelys coriacea*; and unidentified sea turtle), and two marine mammal interactions (one North and one South Atlantic; one bottlenose dolphin, *Tursiops truncatus*, and one unidentified dolphin). Annual estimates of ETP interactions are shown in Table 22 and Table 23 and are derived solely from observer data to provide a very coarse estimate of potential interactions.

The number of interactions were extrapolated from observer data to estimate annual encounters. Estimates were calculated by multiplying the number of sets recorded in logbooks from 2016-2020 (South Atlantic = 16,577, North Atlantic = 8,992) by the interaction rate recorded by observers (sets observed included South Atlantic = 1,203, North Atlantic = 146). Given that UoC logbook data covers only 66% of the fleet, effort was upscaled by 33% to account for vessels in which no catch information was available. Given the coarse method for calculating total ETP interactions, and the rare encounters and low observer coverage, the assessment team urges caution in interpretation of these estimates. Regardless, they are useful in providing an estimate to judge the annual range of interactions.

Table 18. Retained and discarded weights (mt), percent catch volume, and MSC classification based on observer data from 2016-2020 for the South Atlantic UoA. Bait information provided by Tuna Alliance, 2016-20. Only species in which the percent catch volume is ≥ 0.01% is shown. ETP species were analyzed separately below.

Common name	Species name	Discard (mt)	Retained (mt)	Grand Total	Classification
Albacore	*Thunnus alalunga*	15.2	842.3	58.60%	Target
Bali sardinella (bait)	*Sardinella lemuru*		213.8	10.30%	Secondary main
Indian oil sardine (bait)	*Sardinella longiceps*		82.2	5.80%	Secondary main
Bigeye tuna	*Thunnus obesus*	2.2	79.8	4.40%	Primary minor
Blue shark	*Prionace glauca*	39.7	28.3	3.80%	Primary main
Pacific sardine (bait)	*Sardina pilchardus, Sardinops sagax*		33.5	2.10%	Secondary minor
Opah	*Lampris guttatus*	19.9	12.9	2.10%	Secondary minor
Squid/mackerel (bait)	*Illex argentines* *Scomber japonicus*		19.2	1.20%	Secondary minor
Pelagic ray	*Pteroplatytrygon violacea*	11.8		0.80%	Secondary minor
Swordfish	*Xiphias gladius*	1.5	8.2	0.60%	Primary minor
Wahoo	*Acanthocybium solandri*	0.2	9.2	0.60%	Secondary minor
Yellowfin tuna	*Thunnus albacares*	2.3	5.7	0.50%	Primary minor
Atlantic blue marlin	*Makaira nigricans*	2.2	2.4	0.30%	Primary minor
Longnose lancetfish	*Alepisaurus ferox*	4.3		0.30%	Secondary minor
Escolar	*Lepidocybium flavobrunneum*	1.1	3	0.30%	Secondary minor
White marlin	*Tetrapturus albidus*	1.7	2	0.30%	Primary minor
Skipjack tuna	*Katsuwonus pelamis*	0.5	3.2	0.20%	Primary minor
Shortfin mako	*Isurus oxyrinchus*	1.9	1.2	0.20%	Primary minor
Butterfly kingfish	*Gasterochisma melampus*	0.3	2.5	0.20%	Secondary minor
Mahi mahi	*Coryphaena hippurus*	0.9	1.5	0.20%	Secondary minor
Longbill spearfish	*Tetrapturus pfluegeri*	1.3	0.8	0.10%	Secondary minor
Shortbill spearfish	*Tetrapturus angustirostris*	0.1	1.3	0.10%	Secondary minor
Pomfret	*Bramidae*	0.2	1.1	0.10%	Secondary minor
Other teleost		1.5	0.6	0.10%	Secondary minor
Other elasmobranch		0.8	0	0.10%	Secondary minor

Table 19. Retained and discarded weights (kg), percent catch volume, and MSC classification based on logbook from 2016-2020 for the South Atlantic UoA. Bait information provided by Tuna Alliance, 2016-20. Only species in which the percent catch volume is ≥ 0.01% is shown. ETP species were analyzed separately below.

Common name	Species name	Discarded (kg)	Retained (kg)	Percentage contribution	Species classification
Albacore tuna	*Thunnus alalunga*		28,037,254	73.20%	Target
Bali sardine	*Sardinella lemuru*		3,944,995	10.30%	Secondary main
Indian oil sardine	*Sardinella longiceps*		1,866,740	4.87%	Secondary minor
Blue shark	*Prionace glauca*	87,153	1,437,825	3.75%	Primary main
Other fish		118,786	1,173,455	3.06%	Secondary minor
Japanese sardine	*Sardinella zunasi*		789,963	2.06%	Secondary minor
Argentina Squid Japanese mackerel	*Illex argentinus* *Scomber japonicus*		471,806	1.23%	Secondary minor
Yellowtail	*Ocyurus chrysurus*		310,179	0.81%	Secondary minor
Bigeye tuna	*Thunnus obesus*		297,218	0.78%	Primary minor
Other swordfish	*Xiphias spp*	21,713	202,282	0.53%	Secondary minor
Yellowfin tuna	*Thunnus albacares*		185,897	0.49%	Primary minor
Swordfish	*Xiphias gladius*	26,579	62,747	0.25%	Primary minor
Shortfin mako	*Isurus oxyrinchus*	31,203	85,358	0.22%	Primary minor
Skipjack tuna	*Katsuwonus pelamis*	3,199	57,000	0.15%	Primary minor
black sailfish	*Istiompax indica*		40,200	0.11%	Secondary minor
Shortbill swordfish	*Tetrapturus angustirostris*		32,500	0.08%	Secondary minor
Black sailfish (discarded)		16,875		0.00%	Secondary minor
Other teleost			61,246	0.16%	
Other elasmobranch			1,726	0.00%	
Grand Total		305,508	39,058,391		

Table 20. Retained and discarded weights (mt), percent catch volume, and MSC classification based on observer data from 2016-2020 for the North Atlantic UoA. Bait information provided by Tuna Alliance, 2016-20. Only species in which the percent catch volume is ≥ 0.01% is shown. ETP species were analyzed separately below.

Common name	Species name	Discard (mt)	Retained (mt)	Percent composition	Classification
Bigeye tuna	*Thunnus obesus*	2.8	49.51	46.38%	Primary main
Indian oil sardine (bait)	*Sardinella longiceps*		43.8	38.82%	Secondary main
Yellowfin tuna	*Thunnus albacares*	0.2	4.87	4.52%	Primary minor
Blue shark	*Prionace glauca*	3.9		3.48%	Primary main
Swordfish	*Xiphias gladius*	0.3	2.10	2.18%	Primary minor
Longnose lancetfish	*Alepisaurus ferox*	1.5		1.33%	Secondary minor
Pomfret	*Bramidae*	0.4	0.13	0.56%	Secondary minor
Shortfin mako	*Isurus oxyrinchus*	0.5		0.49%	Primary minor
Crocodile shark	*Pseudocarcharias kamoharai*	0.4		0.43%	Secondary minor
Wahoo	*Acanthocybium solandri*	0.2	0.26	0.42%	Secondary minor
Albacore	*Thunnus alalunga*		0.46	0.41%	Target
Atlantic blue marlin	*Makaira nigricans*	0.3	0.14	0.38%	Primary minor
Longfin mako	*Isurus paucus*	0.2		0.20%	Primary minor
Escolar	*Lepidocybium flavobrunneum*	0.1	0.04	0.17%	Secondary minor
Mahi mahi	*Coryphaena hippurus*	0.1	0.04	0.13%	Secondary minor
Atlantic white marlin	*Tetrapturus pfluegeri*		0.08	0.07%	Primary minor
Pelagic thresher shark	*Alopias pelagicus*	0.1		0.04%	Secondary minor
Sunfish	*Mola mola*	0.01		0.01%	Secondary minor
Opah	*Lampris guttatus*	0.01		0.01%	Secondary minor
Grand Total		**11.4**	**57.7**	**100.00%**	

Table 21. Retained and discarded weights (mt), percent catch volume, and MSC classification based on logbook data from 2016-2020 for the North Atlantic UoA. Bait information provided by Tuna Alliance, 2016-20. Only species in which the percent catch volume is ≥ 0.01% are shown. ETP species were analyzed separately below.

Common name	Species name	Discarded (kg)	Retained (kg)	Percent composition	Species classification
Albacore tuna	*Thunnus alalunga*	1,996	5,842,480	47.22%	Target
Bigeye tuna	*Thunnus obesus*	1,117	2,968,430	23.99%	Primary main
Indian oil sardine	*Sardinella longiceps*	2,787,600	2,787,600	22.52%	Secondary main
Yellowfin tuna	*Thunnus albacares*		451,870	3.65%	Primary minor
Swordfish	*Xiphias gladius*	4,487	157,971	1.31%	Primary minor
Blue shark	*Prionace glauca*	41,176	23,167	0.52%	Primary minor
Other fish		2,327	34,841	0.30%	Secondary minor
Atlantic blue marlin	*Makaira nigricans*	8340	17,014	0.20%	Primary minor
Shortbill spearfish	*Tetrapturus angustirostris*	611	9,893	0.08%	Secondary minor
Yellowtail	*Ocyurus chrysurus*	2,176	7,694	0.08%	Secondary minor
Longnose lancetfish	*Alepisaurus ferox*		4,064	0.03%	Secondary minor
Atlantic bonito	*Sarda sarda*		2,533	0.02%	Secondary minor
Mahi	*Coryphaena hippurus*		1,934	0.02%	Secondary minor
Other swordfish			1,254	0.01%	Secondary minor
King Mackerel	*Scomberomorus cavalla*		846	0.01%	Secondary minor
Longbill spearfish	*Tetrapturus pfluegeri*		681	0.01%	Secondary minor
Longfin mako	*Isurus paucus*	636		0.01%	Primary minor
Other teleost			1,851	0.01%	Secondary minor
Other elasmobranch			902	0.01%	Secondary minor
Grand total		**62,866**	**12,315,025**		

Table 22. Total number of caught ETP species that were retained and discarded based on logbook and observer data for the South Atlantic UoA from 2016-2020. Estimated annual catches are based on number of observed sets (1,203 sets) and number of sets reported in logbooks (16,577) over the 5-year period. Effort was increased by 33% to account for the 10 vessels in the UoA where no data was provided.

Common name	Scientific name	Logbook			Observer			Individual #/set	Annual catch (extrapolated)
		Num. Ret.	Num. Dis.	Total Catch	Num. Ret.	Num. Dis.	Total Catch		
SHARKS									
Silky shark	*Carcharhinus falciformis*	0	0	0	0	2	2	0.002	7.3
Oceanic white-tip	*Carcharhinus longimanus*	5	6	11	0	2	2	0.002	7.3
Bigeye thresher	*Alopias superciliosus*	0	236	236	0	12	12	0.010	44.1
Hammerhead spp	*Sphyrna spp.*	0	3	3	0	0	0	0.000	0.0
MARINE TURTLES									
Loggerhead sea turtle	*Caretta caretta*	0	0	0	0	7	7	0.006	25.7
Leatherback sea turtle	*Dermochelys coriacea*	0	0	0	0	3	3	0.002	11.0
Unknown sp.	*Testudinata*	0	34	34	0	5	5	0.004	18.4
SEABIRDS									
Wandering albatross	*Diomedea exulans*	0	0	0	0	4	4	0.003	14.7
Sooty albatross	*Phoebetria fusca*	0	0	0	0	1	1	0.001	3.7
White-chinned petrel	*Procellaria aequinoctialis*	0	0	0	0	1	1	0.001	3.7
Spectacled petrel	*Procellaria conspicillata*	0	0	0	0	8	8	0.007	29.4
Great shearwater	*Puffinus gravis*	0	0	0	0	3	3	0.002	11.0
Atlantic yellow-nosed albatross	*Thalassarche chloro rhynchos*	0	0	0	0	11	11	0.009	40.4
Black-browed Albatross	*Thalassarche melanophrys*	0	0	0	0	11	11	0.009	40.4
Seabird	*Sp. Unknown*	0	45	45	0	0	0	0.000	0.0
MAMMALS									
Dolphin sp.	*Unknown*	0	1	0	0	0	1	0.001	3.7

Table 23. Total number of caught ETP species that were retained and discarded based on logbook and observer data for the North Atlantic UoA from 2016-2020. Estimated annual catches are based on number of observed sets (146 sets) and number of sets reported in logbooks (8,992) over the 5-year period. Effort was increased by 33% to account for the 10 vessels in the UoA where no data was provided.

Common Name	Scientific Name	Logbook			Observer			Individual #/set	Annual catch (estimated)
		Num. Ret.	Num. Dis.	Total Catch	Num. Ret.	Num. Dis.	Total Catch		
SHARKS									
Bigeye thresher shark	*Alopias superciliosus*	0	0	0	0	3	3	0.02	49
Oceanic white tip	*Carcharhinus longimanus*	0	1	0	0	0	0	0.00	0
Shortfin mako	*Isurus oxyrinchus*	0	0	0	0	10	10	0.07	164
MAMMALS									
Common bottlenose dolphin	*Tursiops truncatus*	0	0	0	0	1	1	0.01	16

4.3.1.3 Observer Programs/Information Sources

Since its establishment, ICCAT has implemented a range of tools for the conservation and management of stocks, including total allowable catch (TAC), country catch limits, fish size limits, effort restrictions, observer programs, closed areas and seasons, vessel registration and information exchange, gear regulations, and enforcement measures. ICCAT Rec. 10-10 established minimum standards for its fishing vessel domestic observer programs in the ICCAT area that requires Members to ensure a minimum of 5% observer coverage of fishing effort in each of the pelagic longline, purse seine, and bait-boat fisheries as measured in number of sets or trips for purse seine fisheries; fishing days, number of sets, or trips for pelagic longline fisheries; or in fishing days in bait-boat fisheries. Additionally, observer programs were required to provide representative temporal and spatial coverage of the operation of the fleet to ensure the collection of adequate and appropriate data taking into account characteristics of the fleets and fisheries. Data collection provisions were also specified in the Rec. 10-10, as were reporting requirements to the SCRS and Commission. Each year, Members shall report information collected under domestic observer programs to the SCRS for stock assessment and other scientific purposes in line with procedures in place for other data reporting requirements and consistent with domestic confidentiality requirements, including, *inter alia*, catch rates, the coverage level achieved within their respective fisheries, and details on how coverage levels were calculated. Submission of logbook information is also required as summarized below.

Logbooks

In addition to observer data, the Taiwan Fisheries Agency and ICCAT require the submission of logbooks associated with each longline fishing trip, and submitted data is generally at the set level. Logbooks include information on the vessel, characteristics of the gear (i.e., number of hooks fished), area fished, date of the longline set and estimated catch for key target species (i.e., bigeye) and bycatch. As logbook reporting is generally mandatory, approaching 100% coverage, it represents a supplemental data source for catch and interactions. Taiwan requires all distant water fishing vessels to submit annual logbooks containing information on total catch of tuna, billfish, and certain sharks. ETP species are generally not recorded in logbooks.

Logbook data from all UoA vessels from 2016-2020 was provided to the assessment team to analyze. It is noted that some interactions with ETP species were reported including oceanic whitetip shark, cetaceans, and sea birds (See Table 21 and Table 22). Data was provided for 19 vessels (i.e., UoC). In 2019, there were 30 Taiwanese vessels targeting albacore in ICCAT, meaning logbook coverage in this assessment represents ~66% of the total fleet (ICCAT 2020).

UoA Observer Coverage

Recognizing that the current mandatory level of observer coverage of 5% may have not been implemented by many of the fleets and noting the need to achieve the minimum coverages as mandated by the Commission, Rec. 16-14 was adopted which again specified a minimum of 5% observer coverage of fishing effort for each of the Members, as well as the tasks, obligations and duties of observers, fishing masters (captains), and ICCAT Members. Reporting requirements again called for the annual submission of information of the implementation of the observer program and recommendations for the use of electronic monitoring systems were provided. Recommendation 16-15 requires that all transshipments of ICCAT species take place in port unless they are monitored under the ICCAT Regional Observer Program for transshipment (ROP Transshipment). The ROP Transshipment is limited to large-scale longline vessels flagged to the participating Parties/Entities/Fishing Entities, including those flagged to Taiwan.

While the required observer coverage rate for purse seine vessels has increased over time, coverage rates for longline vessels has remained at 5%. However, decisions at the 2020 Commission meeting require 100% observer coverage, year-round, on purse seine vessels targeting tropical tunas, increasing observer coverage on longline vessels over 20 meters to 10% in 2022, and the development of minimum standards for electronic monitoring by 2021.

CPCs are required to submit annual reports to ICCAT outlining their activities in tuna and tuna-like fisheries in the ICCAT Convention area, including (1) information on fisheries, research, and statistics, and (2) status on the implementation of conservation and management measures. The CPC reports are published as part of ICCAT's Biennial Report and include observer coverage rates for purse seine and longline fisheries operating in the ICCAT Convention area (ICCAT 2015b, ICCAT 2016b, ICCAT 2018e, ICCAT 2020b). The reported UoA observer longline coverage rates in the Atlantic Taiwanese longline fishery were 8.3% in 2014, 7.52% in 2015, 6.63% in 2016, 7.27% in 2017, 6.56% in 2018, and 9.42% in 2019.

MSC provides guidance on the acceptable levels of external validation required to demonstrate the likelihood that shark finning is not taking place (GSA2.4.5-GSA2.4.7) as it relates to observer coverage, and at least 5% observer coverage is required to meet SG60 and "the percentage of on-board observer coverage generally refers to coverage of total fishing effort of all vessels in the UoA." As per MSC Guidance GSA2.4.5-GSA2.4.7 to meet SG80 requirements, an equivalent of 20% nominal observer coverage is required and to meet SG100 "comprehensive external validation" is required. Data stemming from observed trips provided to the assessment team are summarized below by UoC and by year (Table 23).

Table 23. Number of observer trips provided that are associated with UoC vessels. Trip lengths are generally longer in the South Atlantic (approximately 4 months) compared to trip lengths in the North Atlantic UoA (approximately 2 months).

UoA	Vessel Name	Year					Num Sets Observed
		2016	2017	2018	2019	2020	
South Atlantic	CHIEN JUI 102	1	1				67
	CHIEN TSAO 322	1					80
	CHIN LIANG MEI	1					124
	FU MAO 268	1					76
	MAAN FARN 1	1					86
	MAAN FWU 168	1					64
	MAAN FWU 668				1		32
	YING CHIN HSIANG 101				1		133
	YUH MAO 106	1					165
	YUN MAO 102				1		234
	YUN MAO 8					1	142
North Atlantic	MAAN FARN 1	1					116
	MAAN FWU 168	1	1				167
	MAAN FWU 668				1	1	262
Total sets							1,748

The observer data specified whether data was from the North or South Atlantic. The South Atlantic observer data's species composition aligned with that of supplied logbook data. However, the North Atlantic observer data differed substantially from the logbook records, with Albacore (the target species) comprising less than 1% of the catch, and Bigeye tuna as the main species by volume. This suggests the observer data came from fishing activity conducted largely in tropical areas where bigeye catches dominate, compared to northern regions where Albacore is more commonly captured (Figure 16). The difference in observer and logbook data for the UoA suggests that observer data is not representative of fleet activity in the North Atlantic. This has implications regarding ETP interactions, particularly for seabirds which are more commonly present in higher latitudes but were not registered in the North Atlantic observer data.

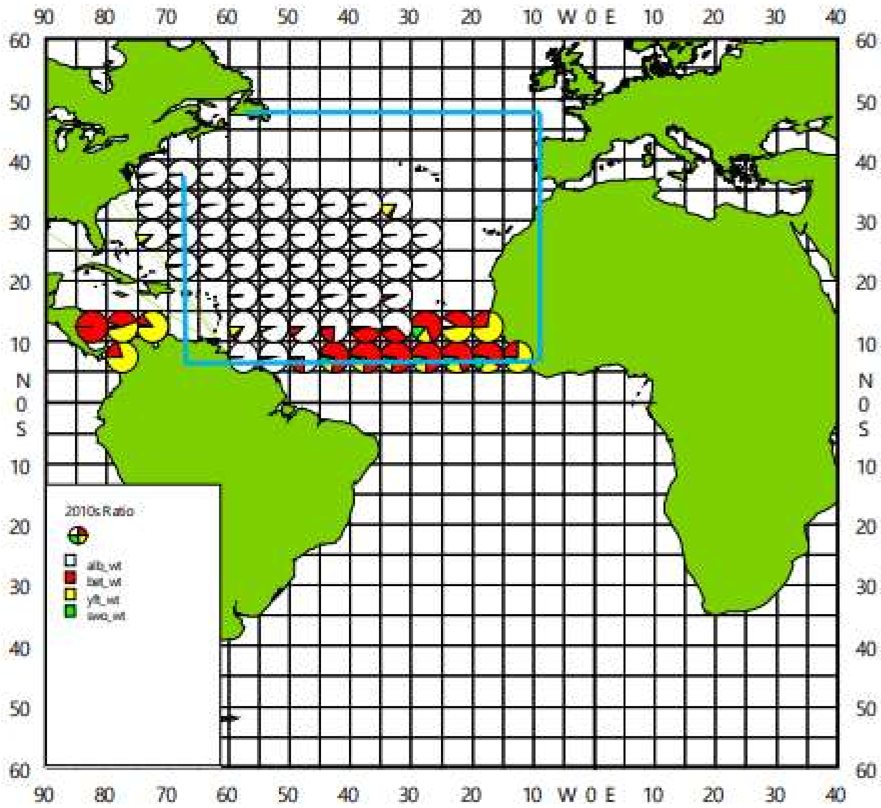


Figure 16. Geographic distribution, by 5 degree-square block, of four major species composition, in terms of catch in weight (from logbooks), caught by Taiwanese longliners in the North Atlantic Ocean between 2010-2016. Four major species are: albacore (ALB in white), bigeye tuna (BET in red), yellowfin tuna (YFT in yellow) and swordfish (SWO in green) (Figure from Cheng and Yeh, 2017).

Supplemental Information – ICCAT Database

The Taiwanese longline vessels achieved 5% observer coverage at the entire UoA level. The assessment team notes that not all observer data was used in the catch composition analysis of this assessment because of data confidentiality preventing access to observer data from vessels outside of the UoC. To further supplement available observer data, the assessment team accessed additional observer/logbook data from fishing vessels operating in the ICCAT Convention area that are publicly available through the ICCAT By-catch Meta-Database (https://iccat.int/en/accesingdb.html; https://www.iccat.int/en/bycatch.html). With the goal of achieving a higher level of confidence in the representativeness of current observer data, the assessment team assembled historical observer and logbook data from the meta-database for Taiwanese longline vessels operating in the Atlantic Ocean during the period 2000-2013 and compared the historical ETP species composition with the current species composition. Based on this comparison, the composition of turtle species interactions was more robust in the historical observer data suggesting the potential for a wider range of species interactions with higher observer coverage. Within the historical database, interactions with loggerhead, leatherback, and olive ridley (*Lepidochelys olivacea*) turtles were reported in the tropical region of the

Atlantic Ocean defined as the area between 23° North and 23° South of the equator. Though the distributions of all three turtle species in the Atlantic Ocean overlap with the defined boundaries of the tropical region, the assessment team considers interactions with the three species to be attributed to fishery impacts in the South Atlantic in particular given turtle interactions were already evidenced in the contemporary dataset associated with observer coverage in the South Atlantic between 2015 and 2019.

This analysis provides insights into potential representativeness of the current observer data and the results are strictly qualitative to better characterize the contemporary dataset. The assessment team does note the observed reductions in turtle interactions through time may result from the adoption of stricter conservation measures but given the current observer coverage rates (approximately 7%-9%), the assessment team took a more precautionary approach by considering these turtle species to be relevant ETP species in this assessment. The incorporation of these findings into the current assessment is discussed further in Section 4.3.1.6 Endangered, Threatened, and Protected (ETP) Species. We also note that based on the analysis of historical observer/logbook data from 2000-2013, approximately 197 seabird interactions occurred in the South Atlantic Ocean. The observed reductions in seabird interactions through time (197 historically vs 5 recently) in the South Atlantic may result from the adoption of stricter conservation measures, all other factors being equal, but the lack of species-specific identification hampers our ability to make direct comparisons over time. The lack of species-specificity with respect to seabirds is now addressed under PI 2.3.3, ETP Information. The assessment team took a precautionary approach and placed a condition under PI 2.3.3 for seabirds and ETP information more broadly.

4.3.1.4 Primary Species

In this assessment, blue shark in the North and South Atlantic and bigeye tuna in the North Atlantic were classified as primary main. Classifications were based on both logbook and observer data Table 18, Table 19). Logbook data represents higher coverage of the fishing effort (approaching 100%) compared to observer data which was reported to cover only 5% of the effort. Logbook data was provided for the Taiwan UoA and reporting is mandatory for all Taiwanese longline fishing vessels. The catch of bigeye tuna in the North Atlantic by the UoA represented approximately 24% of the total based on logbook data and 46% of the total based on observer data, while the catch of blue shark represented approximately 4% based on logbooks and observer data in the South Atlantic and 3.4% based on observer data in the North Atlantic (<1% from logbooks). Following GSA3.1.1, bigeye tuna and blue shark in the North Atlantic are classified as primary main. Following GSA3.1.1 bigeye tuna is classified as primary minor and blue shark is classified as primary main in the South Atlantic.

There are 6 primary minor species caught in the North Atlantic UoA including 2 tuna species (yellowfin and skipjack), 3 billfish species (swordfish and blue and white marlin), and 1 shark species (shortfin mako shark), and their catches are all negligible. In the South Atlantic UoA several minor primary species were caught including four billfish (swordfish, blue and white marlin, and sailfish), three tunas (yellowfin, skipjack, and bigeye), and one shark (shortfin mako), and their catches are all negligible. All primary minor species have been grouped and the all-or-none approach used to score the group. For scoring purposes, the most vulnerable species, shortfin mako shark, was chosen to represent the group. Stock status information for this species is summarized below.

Blue shark (*Prionace glauca*)

Biology

Blue sharks are an abundant, pelagic and oceanic shark, widespread in temperate and tropical waters. The blue shark is placental viviparous and has an average litter size of 35 individuals. A unique behavioral characteristic of this species is its tendency to segregate temporally and spatially by size and/or sex during feeding, mating-reproduction, gestation, and birth processes. Tagging studies have suggested that they exhibit large-scale migratory behaviour and periodic vertical movement, but the lack of information on some components of the populations precludes a complete understanding of their distribution/migration pattern by ontogenetic stage and in some cases identifying their pupping/mating grounds. Numerous aspects of the biology of this species are still poorly understood or completely unknown, particularly for some regions, which contributes to increased uncertainty in quantitative and qualitative assessments. There are two stocks of blue sharks in the Atlantic: North and South.

Blue Sharks are taken in large numbers (an estimated 20 million individuals annually), mainly as bycatch. Estimated catches for the Atlantic Ocean are shown in Figure 17.

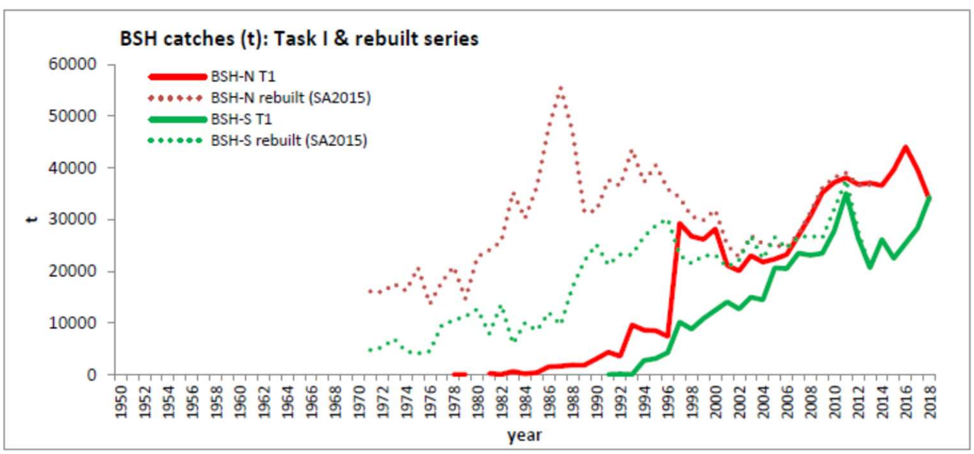


Figure 17. Blue shark catches (North Atlantic Ocean-BSH-N and South Atlantic Ocean-BSH-S) reported to ICCAT (Task I) and estimated by the SCRS Committee for use in the 2015 stock assessment (SA). Source ICCAT 2019

Considerable progress was made on the integration of new data sources, in particular size data, and modelling approaches, particularly model structure, in the 2015 assessment of the status of both the North Atlantic and South Atlantic blue shark stocks in the Atlantic (ICCAT 2015). Complete information on the assessment can be found in the 2015 Blue Shark Data preparatory meeting report (Tenerife, Spain – March 23 to 27, 2015). Multiple standardized CPUE data series for blue shark were used in the 2015 assessment for both the North and South Atlantic stocks (Figure 18). For the North Atlantic stock eight indices of abundance were used. For both stocks, the series were generally flat or showed increasing trends, which conflicted with the similarly increasing catch tendencies, especially for the South Atlantic stock.

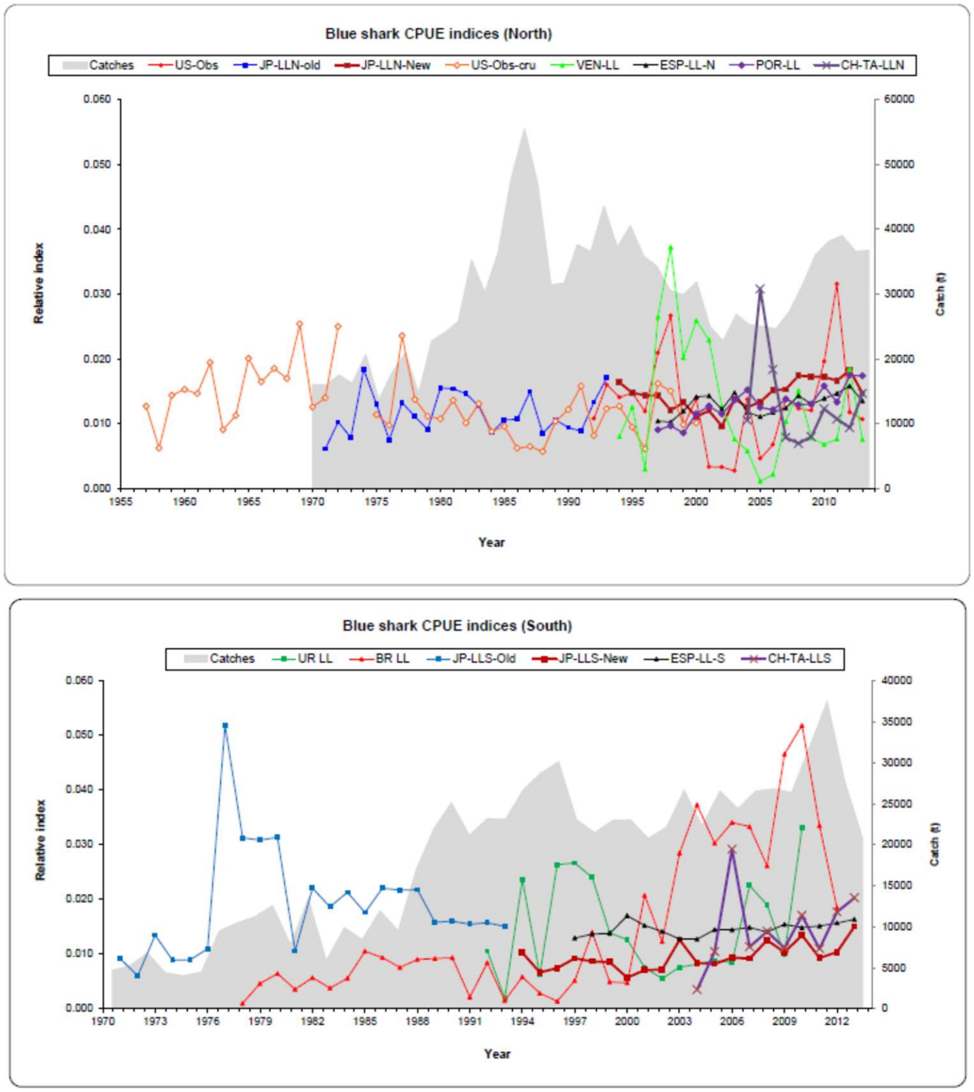


Figure 18. CPUE series used in the 2015 assessments of North and South Atlantic blue shark (BSH) stocks. Total catches (in t) used in the assessments are also shown. Source ICCAT 2019

Status

The latest North Atlantic and South Atlantic blue shark assessments were conducted in 2015 using two modelling platforms, including production models (Baysesian state space and Bayesian surplus production (BSP) models and stock synthesis (SS3) (ICCAT 2015). Uncertainty in data inputs and model configuration was explored in the latest assessment through sensitivity analysis, revealing that the results were sensitive to the model’s structural assumptions (ICCAT 2015). The production models had difficulty fitting the flat or increasing trends in the CPUE series combined with increasing catches. Overall, assessment results are uncertain (e.g., level of absolute abundance varied by an order of magnitude between models with different structures) and should be interpreted with caution. Given the difficulty in determining current stock status, in particular absolute population abundance for both blue shark stocks (North Atlantic and South Atlantic Ocean), the SCRS considered that it was not appropriate to conduct quantitative projections of future stock condition.

For the North Atlantic stock, scenarios with the BSP estimated that the stock was not overfished (B_{2013}/B_{MSY}=1.50 to 1.96) and that overfishing was not occurring (F_{2013}/F_{MSY}=0.04 to 0.50). Estimates obtained with SS3 had higher uncertainties, but still predicted that the stock was not overfished (SSF_{2013}/SSF_{MSY}=1.35 to 3.45) and that overfishing was not occurring (F_{2013}/F_{MSY}=0.15 to 0.75). Combining results from the BSP and SS3 models, B_{2013}/B_{MSY}=1.35 to 3.45 and F2013/F_{MSY}=0.04 to 0.75 (Figure 19). Comparison of results obtained in the 2008 assessment and the current assessment indicated that, despite significant differences between inputs and models used (BSP and a catch-free age-structured production model), stock status results did not deviate substantially (B_{2007}/B_{MSY}=1.87-2.74 and F_{2007}/F_{MSY}=0.13-0.17). Stock status determination metrics from the 2015 North Atlantic Ocean blue shark stock assessment are listed in Table 24.

For the South Atlantic stock, scenarios with the BSP estimated that the stock was not overfished (B_{2013}/B_{MSY}=1.96 to 2.03) and that overfishing was not occurring (F_{2013}/FMSY=0.01 to 0.11). Comparison of results obtained in the 2008 and current assessment were similar for the BSP (B_{2007}/B_{MSY}=1.95 and F_{2007}/F_{MSY}=0.04 for the 2008 base runs). Estimates obtained with the state-space BSP were generally less optimistic, especially when process error was not included, predicting that the stock could be overfished (B_{2013}/B_{MSY}=0.78 to 1.29) and that overfishing could be occurring (F_{2013}/F_{MSY}=0.54 to 1.19) (Figure 20). Stock status determination metrics from the 2015 South Atlantic Ocean blue shark stock assessment are listed in Table 24.

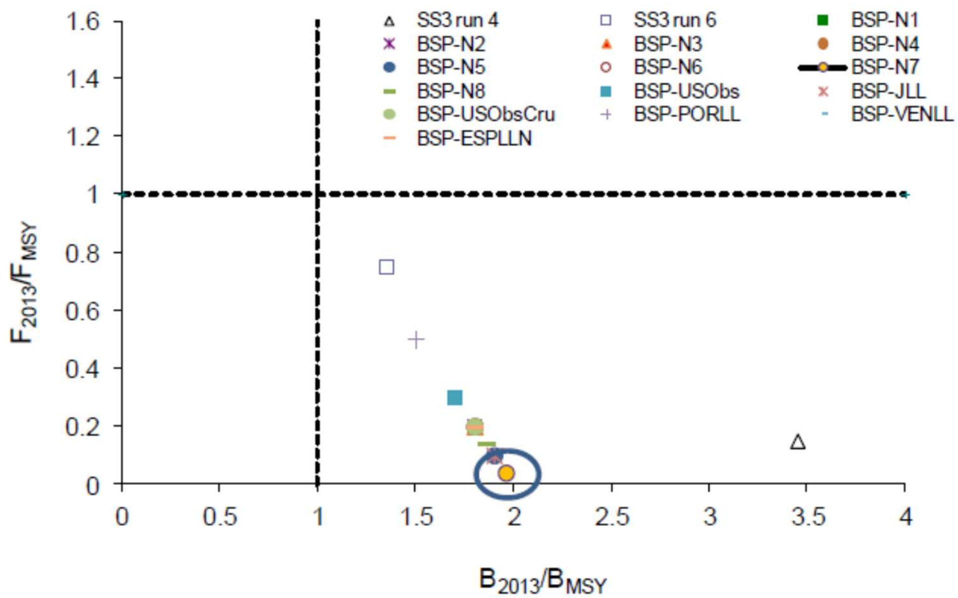


Figure 19. Phase plots summarizing scenario outputs for the current (for 2013) stock status of North Atlantic blue shark (BSH). BSP=Bayesian surplus production model; SS3=Stock synthesis model. The circle notes common status for several BSP runs. Note that the x-axis values for SS3 are SSF2013/SSFMSY. Source ICCAT 2019

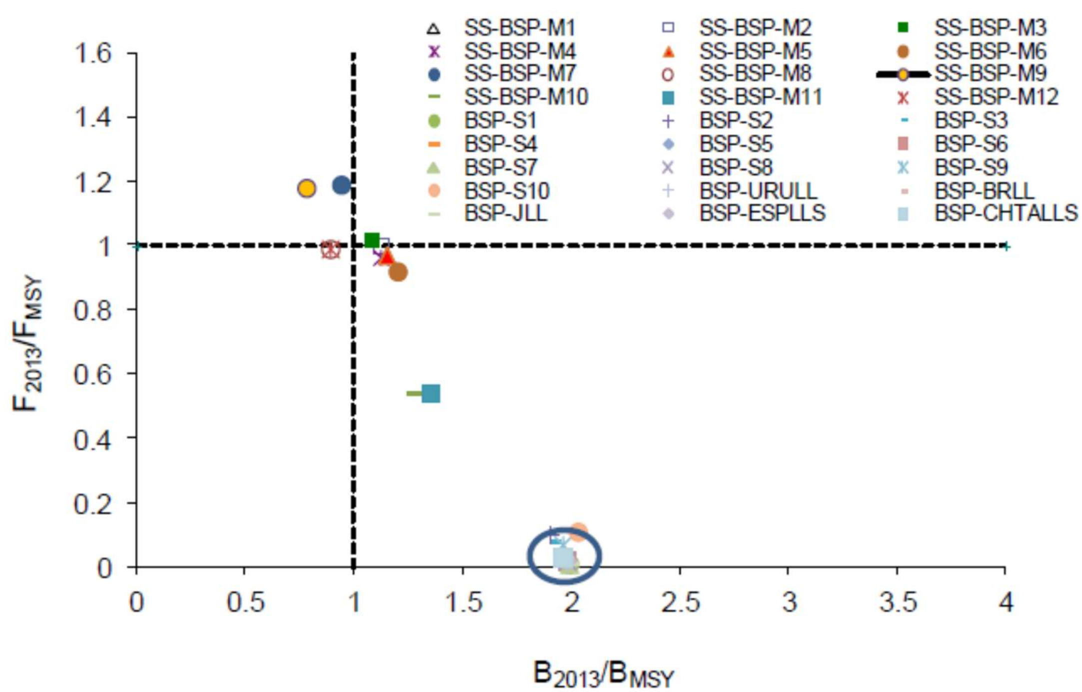


Figure 20. Phase plots summarizing scenario outputs for the current (for 2013) stock status of South Atlantic blue shark (BSH). BSP=Bayesian surplus production model; SS-BSP=State-space Bayesian surplus production model. The circle denotes common status for several BSP runs. Source: ICCAT 2019.

Table 24. Stock status determination metrics from the 2015 Atlantic Ocean blue shark stock assessments. Source: ICCAT 2019.

NORTH ATLANTIC BLUE SHARK SUMMARY		
Current Yield (2018)		33,853 t[1]
Yield (2013)		36,748 t[2]
Relative Biomass	B_{2013}/B_{MSY}	1.35-3.45[3]
	B_{2013}/B_0	0.75-0.98[4]
Relative Fishing Mortality	F_{MSY}	0.19-0.20[4]
	F_{2013}/F_{MSY}	0.04-0.75[5]
Stock Status (2013)	Overfished	Not likely [6]
	Overfishing	Not likely [6]
Management Measures in Effect:		Rec. 16-12

[1] Task I catch.
[2] Estimated catch used in the 2015 assessments.
[3] Range obtained with the Bayesian Surplus Production (BSP) and SS3 models. Value from SS3 is SSF/SSF_{MSY}.
[4] Range obtained with the BSP model.
[5] Range obtained with the BSP and SS3 models.
[6] Although the models explored indicate the stock is not overfished and overfishing is not occurring, the Committee acknowledges that there still remains a high level of uncertainty.

SOUTH ATLANTIC BLUE SHARK SUMMARY		
Current Yield (2018)		34,309t[1]
Yield (2013)		20,799 t[2]
Relative Biomass	B_{2013}/B_{MSY}	0.78-2.03[3]
	B_{2013}/B_0	0.39-1.00[3]
Relative Fishing Mortality	F_{MSY}	0.10-0.20[3]
	F_{2013}/F_{MSY}	0.01-1.19[3]
Stock Status (2013)	Overfished	Undetermined[4]
	Overfishing	Undetermined[4]

[1] Task I catch.
[2] Estimated catch used in the 2015 assessments.
[3] Range obtained with the Bayesian Surplus Production (BSP) and State-Space Bayesian Surplus Production (SS-BSP) models.
[4] Given the uncertainty in stock status, the Committee cannot make a determination but cautions that the stock may have been overfished and overfishing may have occurred in recent years.

Management

The preamble to the ICCAT Convention states that its objective is to maintain the populations of fishes at levels which will permit the maximum sustainable catch for food and other purposes. This applies to all species subject to ICCAT management, including bigeye tuna and blue shark, as well as all primary minor species.

When ICCAT determines management measures are necessary, ICCAT Rec. [11-13] specifies that "*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*" and management measures shall be designed to result in a high probability of maintaining the stock within the green quadrant of Kobe plot (B>BMSY and F<FMSY). Additionally, ICCAT Rec. [15-12] clarifies that, "*In applying a precautionary approach, the Commission should take measures to ensure that when limit reference points are approached, they will not be exceeded. If they are exceeded, the Commission should without delay take action to restore the stocks to levels above the identified reference points*".

ICCAT has demonstrated that it will adopt management measures and rebuilding plans when necessary (e.g. bluefin tuna, swordfish, albacore, bigeye tuna, and blue and white marlin). The assessment team expects that, when deemed necessary, ICCAT will adopt appropriate management measures for all species, consistent with Rec. [11-13] and Rec [15-07] on the development of HCRs and of management strategy evaluation.

ICCAT has adopted recommendations for various species of sharks, including blue, shortfin mako, and porbeagle shark including:

- Rec. [04-10] (Recommendation by ICCAT concerning the conservation of sharks caught in association with fisheries managed by ICCAT);
- Rec. [07-06] (Supplemental recommendation by ICCAT concerning sharks);
- Rec. [10-06] (Recommendation by ICCAT oNo. Atlantic shortfin mako sharks caught in association with ICCAT fisheries);
- Rec. [14-06] (Recommendation by ICCAT on shortfin mako caught in association with ICCAT fisheries); and
- Rec. [15-06] (Recommendations by ICCAT on porbeagle caught in association with ICCAT fisheries).

These require collecting and maintaining complete Task 1 and Task 2 data, periodic stock assessments, the implementation of measures to reduce the mortality of the sharks, alignment of annual catches to MSY levels, correct identification of similar shark species, and release requirements for porbeagle sharks.

Recognizing that Atlantic blue sharks are caught in large numbers in fisheries managed by ICCAT and that the recent stock assessment noted a high level of uncertainty in data inputs, as well as in model structural assumptions, and, therefore, the possibility of the stock being overfished and overfishing occurring could not be ruled out, ICCAT adopted Recommendation 19-07 for North Atlantic blue shark and 19-08 for South Atlantic blue shark. The Recommendations specify:

- TAC and catch limits for Blue Shark;
- Requirements for recording and reporting of catch information;

- Undertaking of scientific research; and
- Potential plan for developing HCRs and biological reference points.

While plans to develop HCRs and harvest strategies for blue shark are established, they are not finalized or in place.

Information

ICCAT requires annual reporting of catches and associated fishing effort by CPC and fishery. Size data is collected annually, and stock assessments are routinely conducted for Atlantic blue shark. Data preparatory meetings for blue shark are routinely convened to review all available data to support stock assessments and resource management decision making, as well as to provide recommendations to advance the collection of requisite data.

Recommendation 19-07 for North Atlantic blue shark and 19-08 for South Atlantic blue shark specified catch limits, requirements for recording and reporting of catch information, CPCs to undertake scientific research, and potential plans for developing harvest control rules and biological reference points. While plans to develop harvest control rules and harvest strategies for blue shark are established, they have not been finalized nor put in place.

For the UoAs, catch information is collected via observer programs and logbooks. For Taiwan, UoA logbook and observer data were provided from 2016 to 2020. Logbook information covers 66% of vessels in the UoA but the extent of logbook reporting (coverage) was not provided.

Bigeye tuna (*Thunnus obesus*)

Bigeye tuna are distributed throughout the Atlantic Ocean between 50ºN and 45ºS, but not in the Mediterranean Sea. They exhibit extensive vertical movements and the species dives to deeper depths than other tropical tuna species. Based on pop-up tagging and archival acoustic tracking studies conducted on adult fish in the Atlantic, bigeye tuna exhibit clear diurnal patterns associated with feeding and are synchronized with depth changes in the deep scattering layer. Spawning takes place in tropical waters and juvenile fish tend to diffuse into temperate waters as they grow. Catch information from surface gears indicate that the Gulf of Guinea is a major nursery ground for this species.

Bigeye tuna prey on a variety of organisms, including fish, mollusks, and crustaceans. Bigeye tuna exhibit relatively fast growth and on average attain a length of about 110 cm fork length at age three, 145 cm at age five and 163 cm at age seven. Recently, however, reports from other oceans suggest that growth rates of juvenile bigeye are lower than those estimated in the Atlantic. The growth rates of bigeye tuna differ between sexes based on Indian Ocean tagging data, with males reaching around 10 cm larger LINF than females. Bigeye tuna become mature around 100 cm at around 3 years old. Young fish form schools mixed with other tunas such as young yellowfin tuna and skipjack which are often associated with drifting objects, whale sharks, and sea mounts. This association weakens as bigeye tuna grow. Indian and Pacific Oceans tagging data showed that bigeye longevity is over 10 years, which may imply lower natural mortality rates than previously being assumed for the Atlantic Ocean. Therefore, the Committee adopted a new natural mortality vector in the 2015 assessment which has also been used in 2018. The lack of identified genetic heterogeneity coupled with wide-scale movements of tagged fish (Figure 21), suggest a single homogeneouSo. Atlantic-wide bigeye tuna stock. However, spatial structuring within the stock is possible. These uncertainties in stock structure, natural mortality, and growth have important implications for the stock assessment and the ongoing Atlantic Ocean Tropical tuna Tagging Programme (AOTTP) is working to reduce some of these uncertainties.

Atlantic bigeye tuna cumulative catches by gear and year are shown in Figure 22. Catches of Atlantic bigeye tuna by gear type for the period 2010-2017 is shown in Figure 23. Reported catches show that catches for the period 2010-2015, when the TAC was 85,000 t [Rec. 09-01], ranged from 67,849 to 80,172 t. In 2016-2017 catches were 79,909 t and 76,982 t, respectively, greater than the TAC of 65,000 t [Rec. 16-01].

The main change in 2018 from the previous assessment was the development and use of a single joint longline standardized abundance index instead of each individual CPC's standardized CPUE indices used in the 2015 assessment. The joint longline standardized index for 1959-2017 was constructed using detailed operational data of major longline fleets (Japan, Korea, United States and Taiwan) (Figure 24).

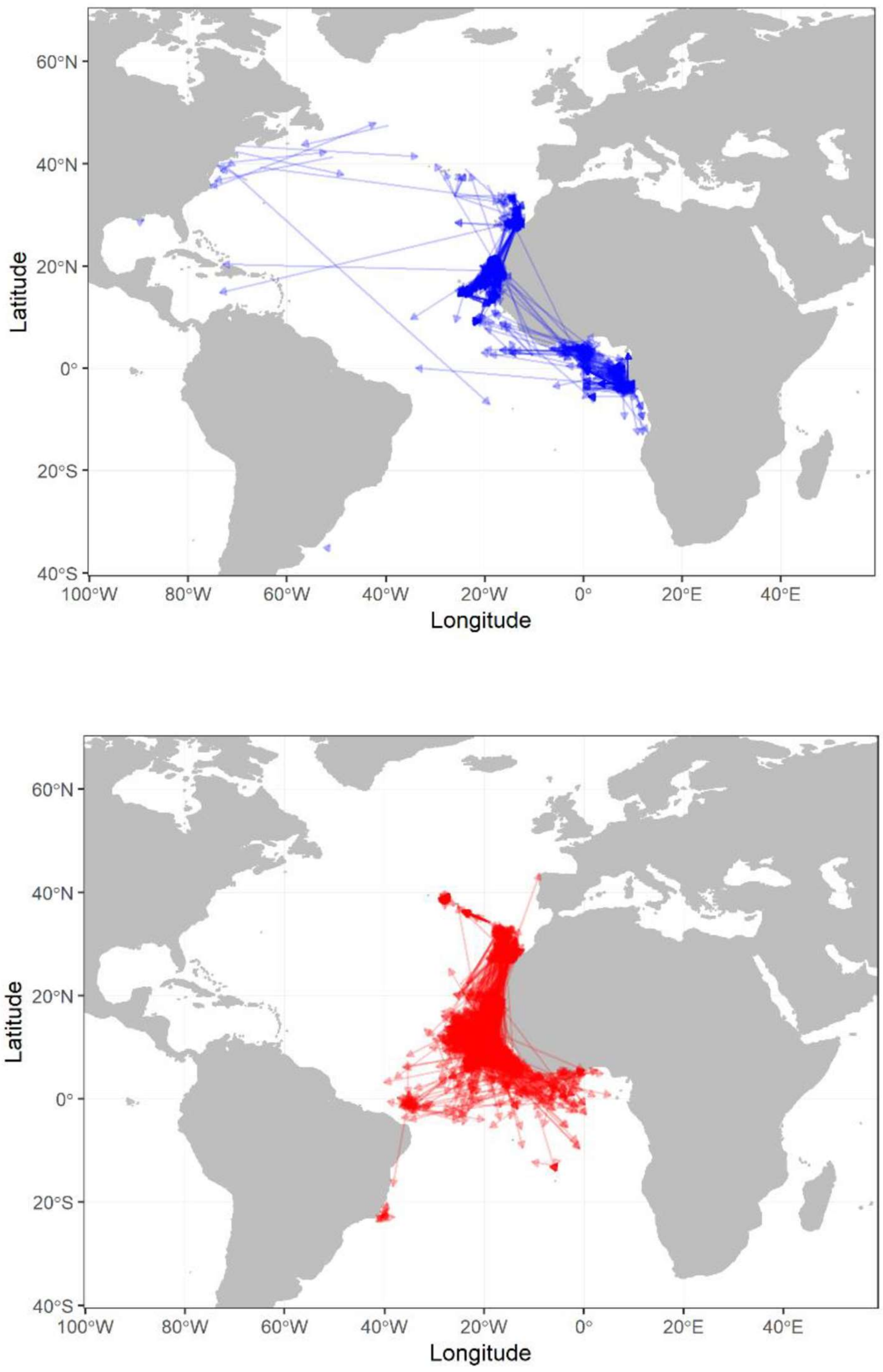


Figure 21. Apparent movements (straight line distance between the tagging location and that of recovery) calculated from conventional tagging from the historical ICCAT tagging database (top panel) and the current AOTTP activities (bottom panel).

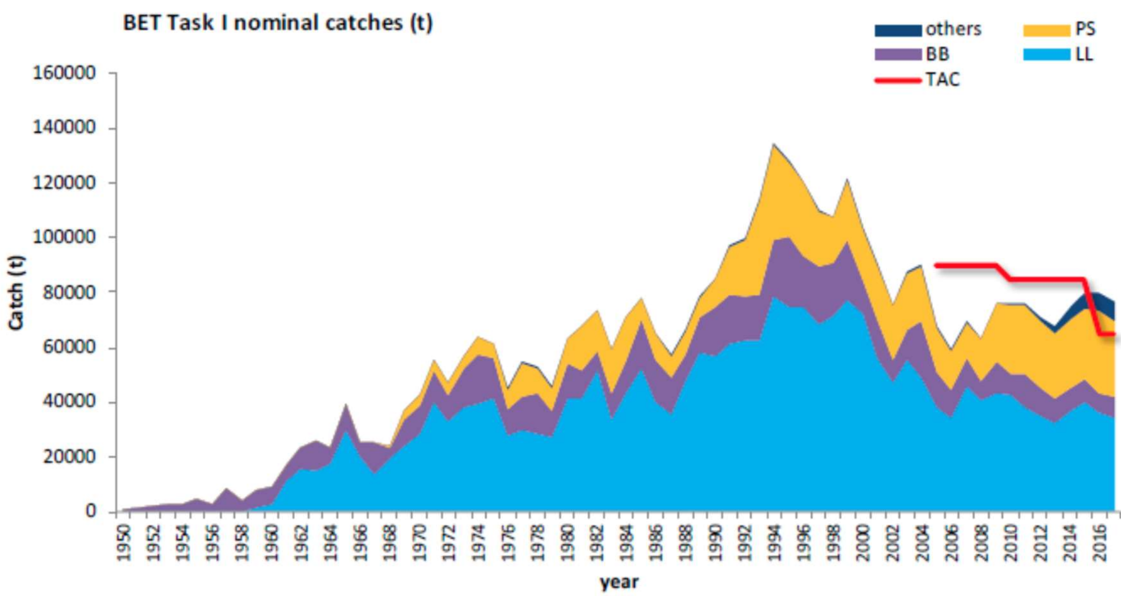


Figure 22. Bigeye estimated and reported catches for all the Atlantic stock (t). The value for 2018 represents preliminary estimates because some countries have yet to provide data for this year or are under revision.

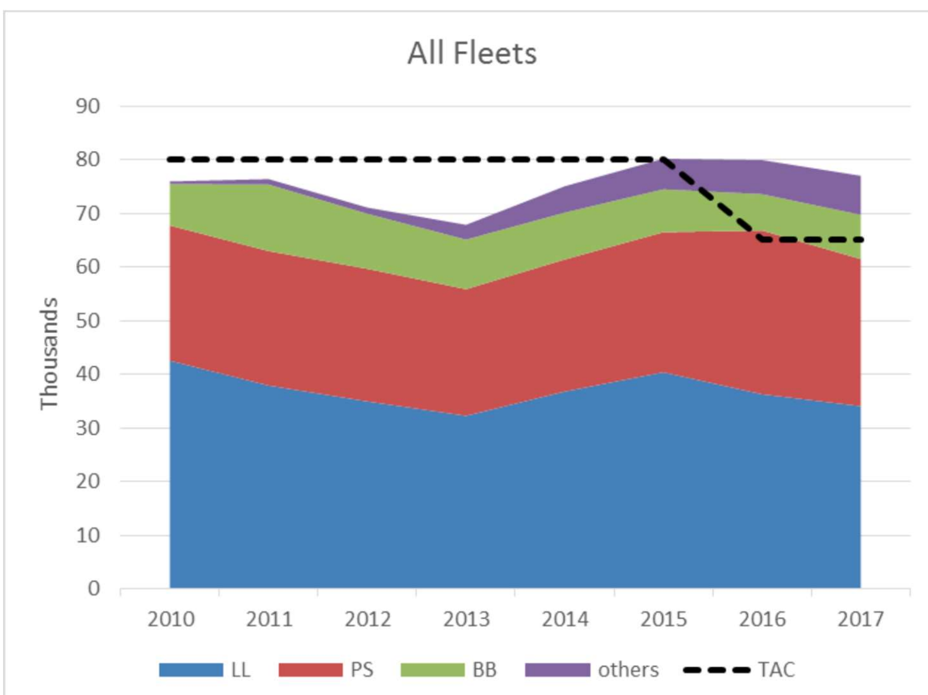


Figure 23. Catches of Atlantic bigeye tuna by gear type for the period 2010-2017.

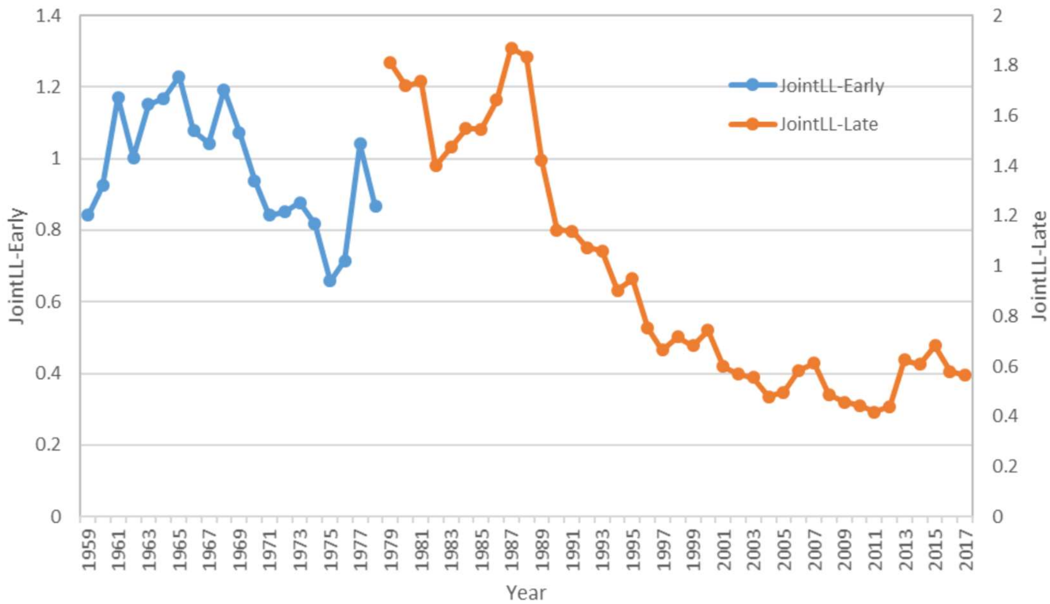


Figure 24. Joint Longline index (1959-1978 without vessel identification and 1979-2017 with vessel identification included in the standardization) used in the integrated stock assessment models and the production assessment models. Note that the second time period of the split index is on the second y-axis.

Status

The latest stock assessment for Atlantic bigeye tuna was conducted in 2018 using similar assessment models to those used in 2015 with updated data through 2017 and a new joint relative abundance index (ICCAT 2018b). Stock status evaluations in 2018 used several modeling approaches, ranging from non-equilibrium (MPD) and Bayesian state space (JABBA) production models to integrated statistical assessment models (Stock Synthesis). Note that stock status is based on the stock synthesis model. Although the results of two production models, non-equilibrium and Bayesian state-space, are not used for management advice they supported the Stock Synthesis stock assessment results.

The Stock Synthesis uncertainty grid includes 18 model configurations that were investigated to ensure that major sources of structural uncertainty were incorporated and represented in the assessment results. Results of the uncertainty grid of Stock Synthesis runs show a long-term decline in SSB with the current estimate at the lowest level in the time series and an increasing trend of fishing mortality (average F on ages 1-7) starting in the early 1990s, with the highest fishing mortality in 1994 and remaining high since then. Based on results of the SS3 uncertainty grid, the Atlantic bigeye stock is currently overfished (SSB/SSB_{MSY} =0.59, ranging from 0.42 to 0.80) and subject to overfishing (F/F_{MSY} = 1.6, ranging from 1.14 to 2.12) with very high probability (99%) (Table 25). Current MSY is likely below historical estimates as the overall selectivity has shifted to smaller fish (ICCAT 2019). Based on projected model runs, probabilities of the stock achieving levels consistent with the Convention objective of the projected time period in 2028 and 2033 was 28% and 44% respectively, for a future constant catches of 65,000 t, which is the TAC established in Rec. 16-01. Projections with the current TAC level are not expected to end overfishing ($F<F_{MSY}$) with 50% probability until 2032. Stock status has declined since the previous stock assessment in 2015 and current MSY is likely below historical estimates as the overall selectivity has shifted to smaller fish (ICCAT 2019).

Table 25. Reference Points, stock status and approximate 90% confidence intervals across all 18 SS3-uncertainty grid runs for Atlantic bigeye tuna.

Quantity	Mean*	Median*	90% LCI**	90% UCI**
F_{2017}/F_{MSY}	1.633	1.629	1.143	2.123
SSB_{2017}/SSB_{MSY}	0.611	0.590	0.426	0.797
Virgin SSB (t)	1421250	1404845	1010578.04	1831921.96
Virgin total biomass (t)	1607423.889	1593220	1196506.124	2018341.654
Virgin recruitment (1000 age 0)	24913	24808	16576	33250
SSB_{MSY}	436256	425601	427919	444593
F_{MSY} (avg F, ages 1-7)	0.194	0.193	0.150	0.238
MSY (t)	76182	76232	72664	79700

*mean and median were calculated across all 18 uncertainty grid runs

**90% confidence interval calculated as mean +/- 1.68*SE

Management

The preamble to the ICCAT Convention states that its objective is to maintain the populations of fishes at levels which will permit the maximum sustainable catch for food and other purposes. This applies to all species subject to ICCAT management, including bigeye tuna and blue shark, as well as all primary minor species.

When ICCAT determines management measures are necessary, ICCAT Rec. [11-13] specifies that "*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, […]*" and management measures shall be designed to result in a high probability of maintaining the stock within the green quadrant of Kobe plot (B>BMSY and F<FMSY). Additionally, ICCAT Rec. [15-12] clarifies that "*In applying a precautionary approach, the Commission should take measures to ensure that when limit reference points are approached, they will not be exceeded. In the event that they are exceeded, the Commission should without delay take action to restore the stocks to levels above the identified reference points*".

ICCAT has demonstrated that it will adopt management measures and rebuilding plans when necessary (e.g., bluefin tuna, swordfish, albacore, bigeye tuna, and blue and white marlin). The assessment team expects that, when deemed necessary, ICCAT will adopt appropriate management measures for all species, consistent with Rec. [11-13] and Rec [15-07] on the development of HCRs and of management strategy evaluation.

Specifically for bigeye tuna, ICCAT has adopted Recommendations 16-01 and 18-01 which specified:

- Total allowable catch for 2016-2019 set at 65,000 t for Contracting Parties and Cooperating non-Contracting Parties, Entities or Fishing Entities.
- Restricting the number of vessels fishing for bigeye tuna to those registered with ICCAT in 2005.
- Specific limits on number of longline boats; China (65), Taiwan (75), Philippines (5), Korea (14), EU (269) and Japan (231).
- Specific limits of number of purse seine boats; EU (34) and Ghana (17).
- No fishing with natural or artificial floating objects during January and February in the area encompassed by the African coast, 20º W, 5ºN and 4ºS.
- No more than 500 FADs active at any time by vessel.
- Use of non-entangling FADs.

Recognizing that the TACs for bigeye tuna were exceeded in 2016 and 2017, and that these overages significantly reduced the probability to reach the Convention objectives by 2028, ICCAT adopted Recommendation 19-02, a comprehensive multi-annual conservation and management program for tropical tunas. This recommendation replaces Recommendation 16-01, entered into force on June 20, 2020, and specified:

- A multi-annual management, conservation, and rebuilding program with the goal of achieving B_{MSY} with a probability of more than 50% by 2034.
- Catch limits for bigeye tuna.
- Procedures for underage or overage of catch of bigeye tuna.
- Catch monitoring requirements.
- Development and submission of fishing and capacity management plan.
- Control measures (vessel registration, observers, IUU, and port sampling).
- Limitations on fishing capacity for tropical tunas.
- A Comprehensive FAD management plan, including management objectives, closure periods, limits on the number of FADs, reporting obligations, construction requirements (non-entangling and biodegradable), and submission of FAD management plans from CPCs.
- Management procedures/management strategy evaluation, including reviews of the current candidate management procedures.

Information

ICCAT requires annual reporting of catches and associated fishing effort by CPC and fishery. Size data is collected annually and stock assessments are routinely conducted for Atlantic bigeye tuna. Bigeye tuna data preparatory meetings are routinely convened to review available data to support stock assessments and provide recommendations to advance data collection programs and implement new sampling programs.

Recommendation [19-02] established a comprehensive multi-annual conservation and management program for bigeye tuna, including specified catch limits, reporting requirements, capacity and control measures, fishing plan, FAD measures, and a rebuilding plan starting in 2020 and continuing through 2034, with the goal of achieving B_{MSY} with a probability of more than 50%. As this Recommendation just entered into force, information is forthcoming.

For the UoAs, catch information is collected via observer programs and logbooks. For Taiwan, UoA logbook and observer data were provided from 2016 to 2020. Logbook information covers 66% vessels in the UoA but the extent of logbook reporting (coverage) was not provided.

4.3.1.5 Secondary Species

The two bait species (Indian oil sardine and Bali sardinella) are the only secondary main species. The fishery catches a wide assortment of secondary minor species in the North and South Atlantic (Table 18, Table 20). SCS adopted an all-or-nothing approach for secondary minor species but as their respective catches were minimal, none are described in any more detail here.

Indian Oil Sardine

The fishery uses Indian oil sardine (*Sardinella longiceps*) as bait, sourced from China and Russia. The largest source fishery for this bait is India, and the team has assumed this as the source. Indian oil sardine is a highly migratory small pelagic fish distributed on the entire west coast of India from Gujarat to Kerala, and also on Tamil Nadu, Pondicherry, Andhra Pradesh and Orisha in the Indian east coast, but the highest abundance is observed off Kerala and Karnataka coasts (FishSource.org). It is most likely the bait originates from either Indian, Pakistani or Omani coastal waters where commercial fisheries for this species exist. A stock assessment was carried out for *S. longiceps* in Oman in 2013 (Zaki et al. 2013), reporting an average annual yield at 2,732 tonnes with MSY at 2,886 t. Considering the UoA uses on average 2,500 tonnes annually, the team considered it highly unlikely that this predominantly artisanal fishery with such low yield was the source of the bait. For the Pakistani stock, a stock appraisal was carried out in 2016 (Baset et al., 2017). The average annual landings of *S. longiceps* stocks were 38,353 t while the highest and lowest 65,050 t in 1994 and 26,937 t in 2009 was recorded correspondingly, below the estimated MSY values.

Major catches (>13,000 tons/year; representing >98.5% of the total catches in India including all gears) in the last years occurred off Maharasthra, Goa, Karnataka, Kerala, Tamil Nadu and Andhra Pradesh, whereas catches off Gujarat, Pondicherry, Odisha and West Bengal were much less important (<4,000 tons/year; representing <1.5% of the total catches in India including all gears; analysis presented on FishSource.org, based on CMFRI annual reports). Stock assessments are conducted at the state level and with the exception of Karnataka, considered 'Less abundant' as of 2016, all are either abundant or underexploited (2017).

Given that the client provided annual bait use data for 20 out of the 30 total Taiwanese vessels licensed to fish for albacore in ICCAT, extrapolating reported bait data to the entire fishery would result in 1,500 mt Indian oil sardine used annually. Based on this volume, it is highly unlikely that the UoA would impact the stock.

Bali sardinella

The exact origin of Bali sardinella (*Sardinella lemuru*) used as bait by the UoA is unknown, but the UoA sources it from Japan. It is a coastal small pelagic, schooling, strongly migratory species that inhabits tropical waters of the Indo-Pacific region (Fishsource 2022; Figure 25). It is abundant in parts of its range (i.e., the Philippines and Indonesia) and contributes significantly to industrial and commercial sardine fisheries throughout a majority of its range. PSA data from 2002-2020 for Bali sardinella (*tamban*) showed that it comprised on average of 12% of total national landings putting it in the top two fisheries resources in the Philippines (OpenSTAT).

It has experienced overfishing in the past and is currently considered overfished in parts of its range (i.e., east Java, Indonesia and the Philippines). Total landings of Bali sardinella in 2019 exceeded 287,000 mt, with 85% of the catch from the Philippines and the remainder from Indonesia (FAO fish stat J). Thus, the assessment team considers it likely that the bait originated from the Philippines.

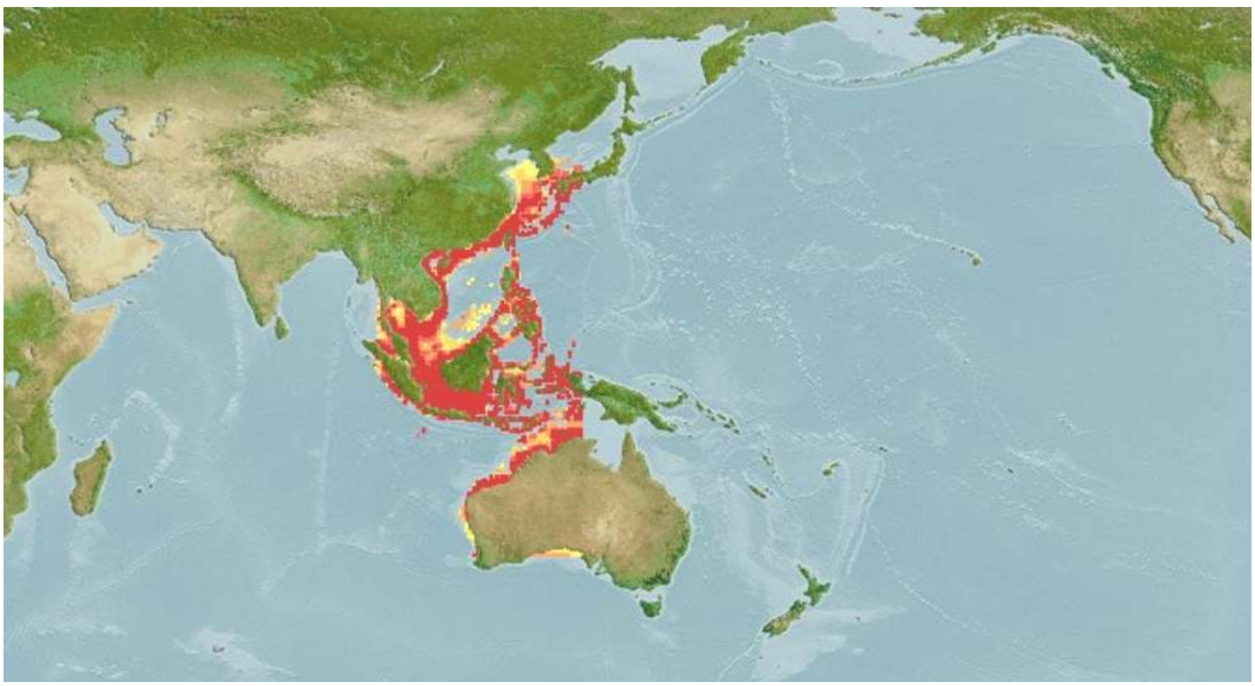


Figure 25. Distribution of Bali sardinella (FishBase)

Stock assessments have been conducted in parts of the species' range. In the Philippines, the latest stock assessment estimated an optimum exploitation rate (E) of 0.6 for all small pelagic stocks, the value set as the Limit Reference Point (LRP) for these fisheries and E = 0.40 as the minimum exploitation rate. The stock assessment found that stock is performing well in some of its range but is over-exploited in certain areas (e.g., Camotes Sea).

The Philippines have established the National Sardines Management Plan (NSMP 2020-2025) to respond to the underperforming indicators of the sardine fisheries sector in Philippines waters by establishing both Biomass-based or Fishing Mortality-based reference points for 3 top sardine species by 2023 and the intent to reduce the proportion of juveniles in the landed catch by 10% in 5 years.

For the NSMFP implementation, scientific advisory included five main goals for the sardine sector:

- To establish and endorse at least 1 Reference Point (RP) by FMA annually as basis for setting up harvest control rules;
- Improve and scaling up of RPs (e.g Standardization of CPUE);
- Determine the F-based or B-based MSY as RP;
- Determine the seasonal and spatial distribution of juveniles; and
- Determine the efficiency of gears.

The client provided annual bait use data for 20 out of the 30 total Taiwanese vessels licensed to fish for albacore in ICCAT. Extrapolating reported bait data to the entire fishery would result in 1,314 mt Bali sardinella used annually. Based on this volume, it is highly unlikely that the UoA would impact the stock.

4.3.1.6 Endangered, Threatened and Protected (ETP) Species

The extent of ETP interactions with UoA vessels was determined using both logbook and observer data sets spanning the years 2016-2020. Observer coverage in the Taiwan UoA was reported to be approximately 5% of effort and covered approximately 52% of the vessels. Logbook reports from the same UoA were significantly more extensive and covered all vessels; note all Taiwanese distant water fisheries are required to submit logbooks at the trip level. Information on ETP species was largely taken from IUCN red list and CMS Shark memorandum of understanding (MOU) sources.

Sharks

Taiwan has established several measures for shark conservation and management, including data collection and the prohibition of retaining, transshipping, landing, storing, or selling bigeye thresher sharks, hammerhead sharks, oceanic whitetip sharks, silky sharks, and North Atlantic shortfin mako (ICCAT 2020).

Silky shark

Biology

Bonfil (2008) reported that based on differences in life-history parameters, it was possible to identify at least three distinct populations of silky sharks (*Carcharhinus falciformis*), those inhabiting the Northwest Atlantic, the western-central Pacific, and the eastern Pacific. Genetic analysis of animals from the Pacific Ocean has also provided evidence that there are distinct eastern and western Pacific populations (Galván-Tirado et al. 2013) although the possibility of a single stock could not be excluded.

Silky sharks are an abundant offshore, oceanic, epipelagic, and littoral tropical species, found near the edge of continental shelves and islands but also far from land in the open sea. Silky sharks occasionally occur inshore where the water is as shallow as 18 m, are most often found at depths of 200 m or more in the epipelagic zone, but also occur down to at least 500 m depth offshore (Bonfil et al. 2009). The silky shark is often found over deep-water reefs and slopes near islands.

Silky sharks are viviparous and have 2 to 14 young per litter. There seems to be no pronounced seasonality in birth of young. The gestation period is not known. It is primarily a fish-eater, eating pelagic and inshore teleosts including sea catfish, mullet, mackerel, yellowfin tuna, albacore, and porcupine fish, but also squid, paper nautilus, and pelagic crabs. It is associated with schools of tuna but is not a desirable species for tuna purse seiners because of the damage it does to nets. It reaches a maximum size of about 330 cm; males mature at about 187 to 217 cm and reach 270 to 300 cm; females mature at 213 to 230 cm and reach at least 305 cm; the size at birth is about 70 to 87 cm.

Status

Silky sharks are among the shark species most commonly captured in high seas longline and purse seine gear and are targeted in various coastal multispecies fisheries. While under-reporting of catches hinders robust assessments of silky shark populations, scientists associated with the WCPFC and IATTC documented steep declines in abundance. The silky shark has ranked high in terms of vulnerability to overfishing in Ecological Risk Assessments conducted by scientists associated with the ICCAT and IOTC. No quantitative assessments have been conducted for silky sharks in the Atlantic Ocean. The global IUCN Red List classification for the silky shark is Near Threatened, with populations in the Eastern Central and Southeast Pacific as well as the Northwest and Western Central Atlantic listed as Vulnerable.

Management

ICCAT Recommendation 11-08 requires all CPC fishing vessels flying their flag and operating in ICCAT managed fisheries to release all silky sharks whether dead or alive, and prohibit retaining on board, transshipping, or landing any part or whole carcass of silky shark. Additionally, CPCs are required to record through their observer programs the number of discards and releases of silky sharks with indication of status (dead or alive) and report it to ICCAT. However, silky sharks that are caught by developing coastal CPCs for local consumption are exempted from these measures. Also, the prohibition on retention does not apply to CPCs whose domestic law requires that all dead fish be landed, that the fishermen cannot draw any commercial profit from such fish, and that includes a prohibition against silky shark fisheries.

Measures to safely release sensitive fauna such as turtles, sharks, whale sharks, and mantas have been adopted, as well as requirements to record all the interactions with these species' groups to fill the data gaps and improve the management of bycatch. Recommendation 19-02 puts in place a comprehensive conservation and management strategy for bigeye tuna that requires the use on non-entangling FADs which will also reduce the overall mortality on silky shark populations in the Atlantic Ocean. Additionally, shark finning is prohibited in ICCAT Recommendation 04-10 and under Taiwan legislation (*Regulations for Tuna Longline or Purse Seine Fishing Vessels Proceeding to the Pacific Ocean for Fishing Operation*).

Information

Observer data showed two silky sharks were captured by the Taiwan South Atlantic UoA though no catches were reported in logbook data. Based on this, the Taiwan UoA total catch is relatively minimal and would have no impact on silky shark populations in the Atlantic Ocean.

Oceanic Whitetip Shark

Biology

The oceanic whitetip shark (*Carcharhinus longimanus*) is an oceanic, epipelagic shark usually found far offshore in the open sea in depths greater than 200 m, between about 30°N and 35°S in all oceans; it is normally found in surface waters, although it has been recorded to 152 m. It has occasionally been recorded inshore but is more typically found offshore or around oceanic islands and areas with narrow continental shelves. Evidence suggests a stock segregation between juveniles and adults of the species. They are viviparous with placental embryonic development, mature at 4 to 5 years of age, and reach 4 m long.

Status

Oceanic whitetip sharks are commonly captured in high seas longline fisheries. While under-reporting of catches hinders robust assessments of oceanic whitetip shark populations in the Atlantic Ocean, they are ranked high in terms of vulnerability to overfishing in Ecological Risk Assessments conducted by scientists associated with the ICCAT. Once among the most abundant oceanic sharks, oceanic whitetip shark has experienced declines as high as 70% within the western North Atlantic between 1992 and 2000 and was assessed to be critically endangered in the Northwest and Western Central Atlantic (Baum et al. 2015). The species is also listed in Appendix 1 of the CMS.

Management

ICCAT Recommendation 10-07 prohibits all CPC fishing vessels flying their flag and operating in ICCAT managed fisheries from retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of oceanic whitetip sharks in any fishery. CPCs are also required to record through their observer programs the number of discards and releases of oceanic whitetip sharks with indication of status (dead or alive) and report it to ICCAT.

Measures to safely release sensitive fauna such as turtles, sharks, whale sharks, and mantas have been adopted, as well as requirements to record all the interactions with these species' groups to fill the data gaps and improve the managements of bycatch. Recommendation 19-02 puts in place a comprehensive conservation and management strategy or bigeye tuna that requires the use on non-entangling FADs which will also reduce the overall mortality on oceanic whitetip shark populations in the Atlantic Ocean. Shark finning is prohibited in ICCAT Recommendation 04-10 and under Taiwan legislation (*Regulations for Tuna Longline or Purse Seine Fishing Vessels Proceeding to the Pacific Ocean for Fishing Operation*).

Information

Based on available logbook data from the UoA, 12 oceanic whitetip sharks were caught, five were retained and the remaining discarded. The assessment team has determined that this would likely have no impact on oceanic whitetip shark populations in the Atlantic Ocean. Nonetheless, compliance with Recommendation 10-07, which prohibits CPS vessels from retaining oceanic whitetip sharks, is not being followed. The assessment team will gather additional information to understand reasons for non-compliance.

Bigeye thresher sharks

Biology

The bigeye thresher shark is a circumglobally distributed species, commonly with an oceanic distribution. It is one of the less productive pelagic shark species, due to the very low fecundity (2 pups per cycle) and late maturity (12–13 years for females) (Sharks MOU, nd). It occurs mostly shallower than 100 m depth but has been recorded to 955 m (Compagno 2001, Coelho et al. 2015). It is present near the surface at night and makes deep dives during the day (Clarke et al. 2015).

Status

The species is most commonly captured in longline, purse seine and gillnet fisheries. Genetic results indicate one global population, however there is some genetic structuring between the Northwest Atlantic and the Pacific Oceans (Rigby et al. 2019). It is listed as vulnerable by IUCN. In the Northwest Atlantic, data from the United States pelagic longline fishery for 1992–2013 indicated that the abundance had stabilized, while noting that fishing pressure had been present for two decades prior to 1992 and that the abundance had likely stabilized at lower abundance than unexploited biomass (Young et al. 2016). In the South Atlantic, CPUE data from a longline fleet indicated a generally decreasing trend from 1971 to 2001 (Mancini 2005), however because the data were not considered robust due to the low catch rates (R. Barreto unpubl. data), they were not analysed over three generations.

Management

In 2009, ICCAT banned retention, transshipment, landing, storage, and sale of bigeye threshers, with a small exception for Mexico. This management action was based on a 2008 Ecological Risk Assessment that ranked the bigeye thresher as the most vulnerable of 16 Atlantic elasmobranch species in terms of overfishing from longlines. Shark finning is prohibited in ICCAT Recommendation 04-10 and under Taiwan legislation (*Regulations for Tuna Longline or Purse Seine Fishing Vessels Proceeding to the Pacific Ocean for Fishing Operation*).

Information

Based on available logbook data from the UoA, 236 bigeye thresher sharks were caught and discarded from the South Atlantic. 15 additional bigeye thresher sharks were present in the observer data, 3 from the North Atlantic and 12 from the South Atlantic. The assessment team has determined that this would likely have no impact on bigeye thresher shark populations in the Atlantic Ocean.

Hammerhead sharks

Biology

Logbook data reported the capture of hammerhead sharks, though no species was identified. Information on the great and scalloped hammerhead is presented here. Great hammerhead (*Sphyrna mokarran*) and Scalloped hammerhead (*Sphyrna lewini*) sharks are long lived, late maturing, and relatively slow growing. Great hammerhead sharks can live to up to 44 years and have a gestation period of 11 months producing 6-33 pups biennially (CMS, nd b). Scalloped hammerhead sharks can live to up to 35 years and have a gestation period of 8-12 months producing 15-31 pups biennially (CMS, nd b).

Status

These species are most often captured in longline or gillnet fisheries. Most information available on the status and trends consists of fisheries catch data for these species. However, catch data are often aggregated due to species identification issues. The current IUCN status for both species is Endangered globally (Baum et al. 2009, Denham et al. 2007). A summary of the stock statuses shows declines throughout the ranges. These species experience very high at-vessel mortality.

Table 26 Hammerhead species stock status in the Atlantic Ocean. Table from CMS Shark MOU group (n.d. b).

Species	Population trend	Region	Time period	Reference
ATLANTIC				
Sphyrna mokarran	3% decrease	NW Atlantic	1995-2012	(Miller et al. 2014)
Sphyrna spp.	50% decline	NE Atlantic	2000-2010	(Diop & Dossa 2011)
Sphyrna lewini	83% decline ➘	NW Atlantic	1981-2005	(Hayes et al. 2009)
Sphyrna spp.	72% decline ➘	NW Atlantic	1981-2005	(Jiao et al. 2008)
Sphyrna mokarran	57% decline ➘	NW Atlantic	1981-2005	(Jiao et al. 2008)

Information

Based on available logbook data from the UoA, a total of 3 hammerhead sharks were caught and all discarded. It is unknown which species of hammerhead were captured. The assessment team has determined that this would likely have no impact on hammerhead shark populations in the Atlantic Ocean.

Shortfin Mako Shark (Northern stock)

Biology

The Northern shortfin mako shark (*Isurus oxyrinchus*) is protected under ICCAT as of 2021 and vessels are required to release any individuals captured. The same protection does not extend to the Southern stock. The shortfin mako is a coastal, oceanic species occurring from the surface to at least 500 m depth and is widespread in temperate and tropical waters of all oceans from about 50°N (up to 60°N in the northeast Atlantic) to 50°S. This species grows slowly, reaching maturity at about 8 years old and living to be more than 30. They reproduce every three years and gestation is 18 months, with a mean litter size of 12.

Status

The latest assessment of the status of North and South Atlantic stocks of shortfin mako shark was conducted in 2017 with updated time series of relative abundance and annual catches, life history metrics, and with the inclusion of length composition data (Anon 2017). For the North Atlantic stock, results of nine stock assessment model runs were selected to provide stock status and management advice. Although all results indicated that stock abundance in 2015 was below B_{MSY}, results of the production models (BSP2JAGS and JABBA) were more pessimistic (B/B_{MSY} deterministic estimates ranged from 0.57 to 0.85), and those of the age-structured model (SS3), which indicated that stock abundance was near MSY (SSF/SSF_{MSY} = 0.95 where SSF is spawning stock fecundity), were less pessimistic. The ratio B_{2015}/B_0 was estimated at to range from 0.34-0.57. Current F was estimated to be well above F_{MSY} (F_{2015}/F_{MSY} = 1.93-4.38), with a combined 90% probability from all the models of being in an overfished state and experiencing overfishing (Figure 26).

Projections indicated that current catch levels (3,600 t and an alternative, 4,750 t, based on catch ratios) in the North Atlantic will cause continued population decline. Catches would need to be reduced to 1,000 t or lower to prevent further population declines. The Kobe II strategy matrices showed that for a constant annual catch of 1,000 t, the probability of being in the Kobe plot green zone would only be 25% by 2040. It was noted that the outlook is probably more pessimistic because the fisheries are removing mostly juveniles and thus it can be anticipated that spawning stock will keep declining for years after fishing pressure has been reduced.

Management

In 2021, ICCAT members approved a two-year no retention policy for shortfin makos in the North Atlantic. It should be noted that the shortfin mako is a slow-growing species, and populations are particularly impacted by the fact that juvenile sharks are subject to high mortality and low post-release survival rates in fishing operations, thwarting recovery rates in fished populations (Byrne et al. 2017).

Information

It is estimated the fishery catches 164 shortfin makos in the North Atlantic per year based on observer data. When compared to the estimated population of the species, and with the knowledge that retention of this species is now prohibited, it is highly likely that the fleet would not hinder recovery of the North Atlantic stock of shortfin mako.

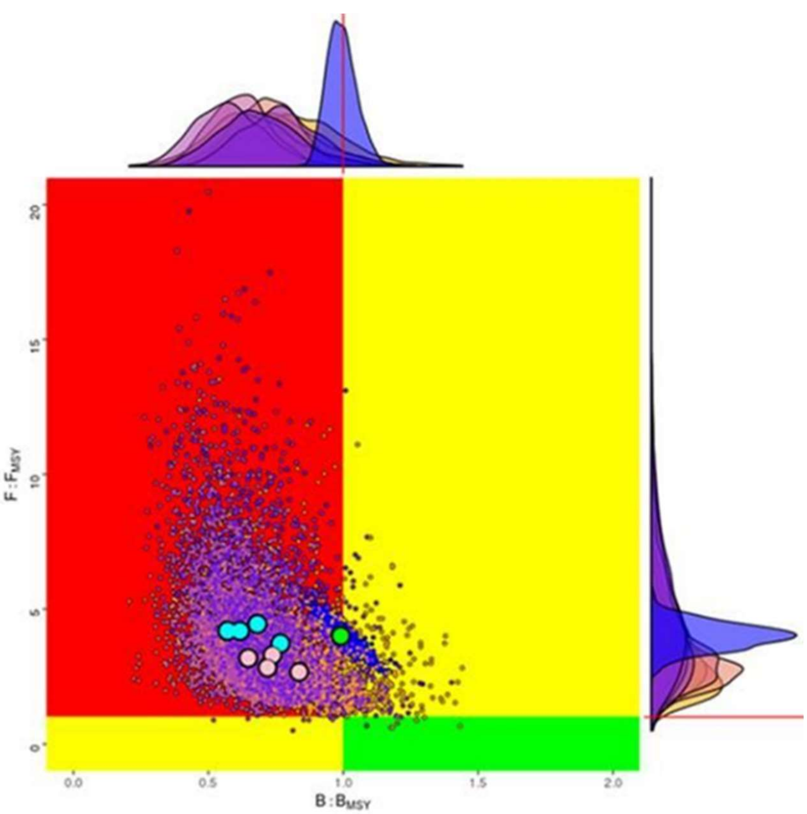


Figure 26. Stock status of North Atlantic shortfin mako based on Bayesian production models (4 BSP2JAGS and 4 JABBA runs) and 1 length-based, age-structured model (SS3). The clouds of points are the bootstrap estimates for all model runs showing uncertainty around the median point estimate for each of nine model formulations (BSP2JAGS: solid pink circles; JABBA: solid cyan circles; SS3: solid green circle). The marginal density plots shown

are the frequency distributions of the bootstrap estimates for each model with respect to relative biomass (top) and relative fishing mortality (right). The red lines are the benchmark levels (ratios equal to 1). PRI is estimated to be ½ BMSY (from ICCAT 2017).

Sea turtles

Loggerhead

Biology

Loggerhead (*Caretta caretta*) turtles are found in the Atlantic, Pacific, and Indian Oceans, as well as the Mediterranean Sea. The species spends most of its life in saltwater and estuarine habitats, with females briefly coming ashore to lay eggs. The loggerhead sea turtle has a low reproductive rate; females lay an average of four egg clutches and then become quiescent, producing no eggs for two to three years. The loggerhead reaches sexual maturity within 17-33 years and has a lifespan of 47-67 years.

The average loggerhead measures around 90 cm (35 in) in carapace length when fully grown. The adult loggerhead sea turtle weighs approximately 135 kg (298 lb), with the largest specimens weighing in at more than 450 kg (1,000 lb). The skin ranges from yellow to brown in color, and the shell is typically reddish brown. No external differences in sex are seen until the turtle becomes an adult, the most obvious difference being the adult males have thicker tails and shorter plastrons (lower shells) than the females.

During their migration from their nests to the sea, hatchlings are preyed on by dipteran larvae, crabs, toads, lizards, snakes, seabirds such as frigate birds, and other assorted birds and mammals. In the ocean, predators of the loggerhead juveniles include portunid crabs and various fishes, such as parrotfishes and moray eels. Adults are more rarely attacked due to their large size, but may be preyed on by large sharks, seals, and killer whales.

Status

It is difficult to estimate the population size of loggerhead turtles and many assessments focus on nesting beach counts of returning females. The Northwest Atlantic loggerhead subpopulation nests throughout the southeast United States and the Caribbean region, with the most significant nesting aggregations in Florida, Georgia, and South Carolina in the United States, and along the Yucatán Peninsula of Mexico. Its marine habitat encompasses nearly the entire Gulf of Mexico, Caribbean Sea, and North Atlantic Ocean. Long-term studies of this large and widespread population show an overall 2% increase, although the population is declining at a number of individual beaches.

The northeast Atlantic loggerhead subpopulation nests in the Cape Verde archipelago, with a few nests also recorded in Mauritania and Guinea. Its marine habitats extend across a large area off northwest Africa, spreading out to the Azores in the northwest down to the coastal areas of Sierra Leone in the southeast. The subpopulation is considered endangered because the vast majority of nesting habitat is concentrated in a relatively small area in Cape Verde and is subject to continuing anthropogenic pressure (e.g., intensive sand extraction and tourism development), which is causing an ongoing decline in habitat area, extent, and quality.

Management

Loggerhead sea turtles are classified as vulnerable by the IUCN and are listed under Appendix I of the CITES, making international trade illegal. ICCAT Recommendation 10-09 requires all CPCs to collect information on the interactions of its fleet with sea turtles in ICCAT fisheries by gear type, including catch rates that take into consideration gear characteristics, times and locations, target species, and disposition status (i.e., discarded dead or released alive). Additionally, purse seine vessels flagged to that CPC operating in the ICCAT Convention area shall require that vessels avoid encircling sea turtles to the extent practicable, release encircled or entangled sea turtles, including on FADs, when feasible, and report interactions between purse seines and/or FADs and sea turtles to their flag CPC so that this information is included in the CPC reporting requirements. For pelagic longline vessels flagged to that CPC operating in the ICCAT Convention area are required to carry on board safe handling, disentanglement, and release equipment capable of releasing sea turtles in a manner that maximizes the probability of their survival.

Information

Based on the allocation of unidentified turtle interactions to turtle species generally found in the region, there were potentially 11 loggerhead turtle interactions in the South Atlantic Ocean during the period 2016-2020. Logbook data provided to the assessment team did not report life status of turtles upon discard. To be precautionary, a 100% mortality was assumed. Noting that the catch of loggerhead turtles by the UoA is significantly less than purse seine catches of loggerhead turtles in the Atlantic Ocean, the assessment team does not consider the loses to pose a risk to the population of loggerhead turtles in the Atlantic Ocean. The assessment team will gather additional information on UoA catches to determine accurate catch levels.

Leatherback Turtles

Biology

The leatherback (*Dermochelys coriacea*) turtle is the largest of all living turtles, reaching lengths of up to 2 meters and weights of 600 kg (WWF 2007). The largest leatherback ever recorded was almost 10 feet (305 cm) from the tip of its beak to the tip of its tail and weighed in at 2,019 pounds (916 kg) (CCC/STSL 2007). This species of marine turtle is primarily found in the open ocean, reaching as far north as Alaska and as far south as the southern tip of Africa, though recent satellite tracking research indicates that leatherbacks spend time feeding in areas just offshore (e.g., Dodge et al. 2014, Wallace et al. 2015). Leatherbacks have delicate, scissor-like jaws, and feed almost exclusively on jellyfish (CCC/STSL 2007).

While leatherback turtles grow faster than hard-shelled turtles, there is uncertainty about the age at which they reach sexual maturity and average estimates range from 9 to 20 years of age. Little is known about their life expectancy, but they are likely long-lived, with longevity estimates of 45 to 50 years, or more.

Nesting beaches are primarily located in tropical latitudes around the world. Globally, the largest remaining nesting aggregations are found in Trinidad and Tobago, West-Indies (Northwest Atlantic) and Gabon, Africa (Southeast Atlantic). Nesting is generally at intervals of 2 to 3 years, though recent research indicates they can nest every year. They can nest between 6-9 times per season, with an average of 10 days between nestings. Adult females lay an average of 80 large, fertilized eggs, the size of billiard balls, and 30 smaller, unfertilized eggs, in each nest. Eggs incubate for about 65 days. Unlike other species of sea turtles, leatherback females may change nesting beaches, though they tend to stay in the same region (CCC/STSL 2007).

Status

It is difficult to estimate the population size of leatherback turtles and many assessments focus on nesting beach counts of returning females. Seven discrete populations (DPS) of leatherback turtle have been identified based on genetic analysis:

- Northwest Atlantic DPS;
- Southwest Atlantic DPS;
- Southeast Atlantic DPS;
- Southwest Indian DPS;
- Northeast Indian DPS;
- West Pacific DPS; and
- East Pacific DPS.

It is estimated that the global population of leatherbacks has declined 40 percent over the past three generations (National Marine Fisheries Service and U.S. Fish and Wildlife Service 2020). The major threats to leatherback turtles worldwide include habitat loss and modification, overutilization, predation, inadequate regulatory mechanisms, fisheries bycatch, pollution, and climate change. For all discrete populations, fisheries bycatch is considered a primary threat. Globally, leatherback status according to IUCN is listed as Vulnerable, but many subpopulations (such as in the Pacific and Southwest Atlantic) are Critically Endangered.

In the Northwest Atlantic, leatherback nesting was increasing; however, there have been significant decreases in recent years at numerous locations, including on the Atlantic coast of Florida, which is one of the main nesting areas in the continental United States. Large but potentially declining nesting populations also occur in the southeast Atlantic, along the west African coastline, but uncertainty in the data limits our understanding of the trends at many of those nesting beaches (National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020).

Management

Globally, leatherback sea turtles are classified as Vulnerable by the IUCN and are listed under Appendix I of CITES, making international trade illegal. As noted, there are 7 discrete populations of leatherback turtle, and the Southwest Atlantic population is categorized as Critically Endangered. ICCAT Recommendation 10-09 requires all CPCs to collect information on the interactions of its fleet with sea turtles in ICCAT fisheries by gear type, including catch rates that take into consideration gear characteristics, times and locations, target species, and disposition status (i.e., discarded dead or released alive). Additionally, purse seine vessels flagged to that CPC operating in the ICCAT Convention area shall require that vessels avoid encircling sea turtles to the extent practicable, release encircled or entangled sea turtles, including on

FADs, when feasible, and report interactions between purse seines and/or FADs and sea turtles to their flag CPC so that this information is included in the CPC reporting requirements. Pelagic longline vessels operating in the ICCAT Convention area are required to carry on board safe handling, disentanglement, and release equipment capable of releasing sea turtles in a manner that maximizes the probability of their survival.

Information

Based on the allocation of unidentified turtle interactions to turtle species generally found in the region, there were potentially 12 leatherback turtle interactions in the Atlantic Ocean during 2016-2020. Logbook data provided to the assessment team did not report life status of turtles upon discard. To be precautionary, 100% mortality was assumed. Noting that the catch of leatherback turtles by the UoA is significantly less than purse seine catches of leatherback turtles in the Atlantic Ocean, the assessment team does not consider the losses to pose a risk to the population of leatherback turtles in the South Atlantic Ocean. The assessment team will gather additional information on UoA catches to determine accurate catch levels.

Olive Ridley Turtles

Biology

The olive ridley (*Lepidochelys olivacea*) is one of the world's smallest sea turtles. There is no information on longevity of olive ridley turtles, but they are likely long-lived. Olive ridleys reach maturity around 14 years of age (Zug et al. 2006). Females nest every year, one to three times a season, laying clutches of approximately 116 eggs (Schulz 1975). In the westerNo. Atlantic there are only three countries in which significant numbers of olive ridley nests (totaling about 1,400-1,600 nests) are made each year:

- Suriname: Principally Eilanti beach, and secondarily Matapica beach;
- French Guiana: Ya:lima:po beach and others, both east and west of Cayenne; and
- Brazil: the beaches of Pirambu, Abaís, and Ponta dos Mangues in the state of Sergipe, in northern Brazil.

In the easterNo. Atlantic, nesting occurs in Africa, particularly in Gabon, but there is only limited long term quantitative information available to determine significance of nesting areas (IUCN 2008).

The olive ridley is omnivorous, feeding on a wide variety of food items, including algae, lobster, crabs, tunicates, and mollusks. Olive ridleys can dive to depths of 500 feet to forage on benthic invertebrates.

Status

It is difficult to estimate the population size of olive ridley turtles and many assessments focus on nesting beach counts of returning females. According to the IUCN, there has been between a 30 to 50 percent reduction in global population size. Although some nesting populations have increased in the past few years or are currently stable, the overall reduction in some populations is greater than the overall increase in others (IUCN 2008).

In the westerNo. Atlantic Ocean, although there has been an 80 percent reduction in certain nesting populations since 1967, Brazil has seen an increase in their nesting population. In the easterNo. Atlantic Ocean, Gabon currently hosts the largest olive ridley nesting population in the region with 1,000 to 5,000 breeding females per year.

The major threats to olive ridley turtles worldwide include habitat loss and modification, overutilization, predation, inadequate regulatory mechanisms, fisheries bycatch, pollution, and climate change. For all populations, fisheries bycatch is considered a primary threat. Globally, olive ridley status according to IUCN is listed as Vulnerable.

Management

Globally, olive ridley turtles are classified as Vulnerable by the IUCN and are listed under Appendix I of CITES, making international trade illegal. ICCAT Recommendation 10-09 requires all CPCs to collect information on the interactions of its fleet with sea turtles in ICCAT fisheries by gear type, including catch rates that take into consideration gear characteristics, times and locations, target species, and disposition status (i.e., discarded dead or released alive). Additionally, purse seine vessels flagged to that CPC operating in the ICCAT Convention area shall require that vessels avoid encircling sea turtles to the extent practicable, release encircled or entangled sea turtles, including on FADs, when feasible, and report interactions between purse seines and/or FADs and sea turtles to their flag CPC so that this information is included in the CPC reporting requirements. Pelagic longline vessels operating in the ICCAT Convention area are required to carry on board safe handling, disentanglement, and release equipment capable of releasing sea turtles in a manner that maximizes the probability of their survival.

Information

Based on the allocation of unidentified turtle interactions to turtle species generally found in the region, there were potentially 20 olive ridley turtle interactions in the Atlantic Ocean during the period 2016-2020. Logbook data provided to the assessment team did not report life status of turtles upon discard. To be precautionary, a 100% mortality was assumed. Noting that the catch of olive ridley turtles by the UoA is less than purse seine catches of olive ridley turtles in the Atlantic Ocean, UoA vessels carry safe handling tools (e.g., turtle de-hooker) on board, and UoA vessels follow handling and release guidelines consistent with the FAO "Best practices for sea turtle handling and release", the assessment team does not consider the loses to pose a risk to the population of olive ridley turtles in the Atlantic Ocean.

Sea birds

Sooty Albatross

Biology

The Sooty albatross (*Phoebetria fusca*) breeds on islands in the South Atlantic and Indian Oceans (BirdLife 2018). The pelagic distribution is mainly between 30°S and 60°S in the southern Indian and Atlantic Oceans, with a southern limit of 65°S near Antarctica and a northern limit of 20°S. Adults move north in winter from sub-Antarctic to subtropical seas, whereas immature birds tend to remain in subtropical seas year-round. The species infrequently disperses eastward to the Tasman Sea and New Zealand waters (ACAP 2009).

Status

This species qualifies as Endangered from the IUCN owing to a very rapid decline over three generations (90 years), probably due to interactions with fisheries. The total annual breeding population is estimated at 10,617-14,328 pairs (ACAP 2012), including c.2.500-5,000 pairs on Gough Island, 3,157 pairs in the Tristan da Cunha group (to the U.K.), c. 1,450 pairs on Prince Edward and c. 1,700 pairs on Marion Island (South Africa), 2,080-2,200 pairs on the Crozet Islands, and 470 pairs on Amsterdam Island (French Southern Territories). However, high variability in population counts between years necessitates caution and further data are required before a change in status should be considered.

Management

Listing by the IUCN and ACAP provides protection and efforts to minimize interactions should be implemented. ICCAT Recommendations 07-07 and 11-09 establish requirements to minimize interactions with seabirds including achieving reductions in levels of seabird by-catch across all fishing areas, seasons, and fisheries through the use of effective mitigation measures and require all longline vessels fishing south of 25° South Latitude to use at least two of the three mitigation measures: night setting, bird-scaring lines (tori lines), or weighted main line. DiNardo et al. (2021) noted that all UoA vessels fishing south of 25° South Latitude use tori lines and weighted main line as specified in Recommendation 11-09. When onboard, observers verify use of the mitigation measures, while for trips without an observer the port inspectors verify the presence of these mitigation gear on the vessel. Note reporting of bird interactions is mandatory by scientific observers in accordance with the Recommendation 10-10.

While not a management measure, Bird Life International has implemented training programs in Taiwan to educate fishers and managers on effective mitigation measures and safe handling practices to minimize mortality due to fishing interactions.

Information

Seabird interactions were reported in logbooks (N = 45) but not at the species level. Observer data reported interaction of 1 individual over the observed trips. Given the lack of species-specific data collection from logbooks, it is unknown how many individuals the fishery would have interacted with. While catch volumes of the fishery are not expected to impact the population, the lack of detailed species-specific information is a problem.

White-chinned petrel

Biology

The white-chinned petrel (*Procellaria aequinoctialis*) breeds on South Georgia (Georgias del Sur), Prince Edward Islands (South Africa), Crozet Islands, Kerguelen Islands (French Southern Territories), Auckland, Campbell and Antipodes Islands (New Zealand), and in small numbers in the Falkland Islands (Islas

Malvinas) (BirdLife 2018c). The species feeds on cephalopods, crustaceans and fish and processing waste from fisheries or discarded longline baits.

Status

The main threat faced by the white-chinned petrel is high rate of incidental mortality in longline fisheries, although bycatch mitigation measures are returning a significant decrease in mortality (BirdLife 2018b). The white-chinned petrel is considered vulnerable by the IUCN. Recently revised global population of 1,200,000 breeding pairs, down from 1,430,000 pairs in the 1980s, is estimated based on figures from 1985-2011. This equates to an estimated global population of 3 million mature individuals, based on the number of breeding pairs extrapolated according to a ratio from Brooke (2004).

Management

Sea bird management measures are the same for birds captured in this fleet in ICCAT. Readers are directed to the management section above for sooty albatross.

Information

Seabird interactions were reported in logbooks (N=45) but not at the species level. Observer data reported interaction of 1 individual over the observed trips. While catch volumes of the fishery are not expected to impact the population, the lack of detailed species-specific information is a concern.

Spectacled petrel

Biology

The spectacled petrel (Procellaria conspicillata) is confined to the South Atlantic Ocean north of the South Polar Front, predominantly between 25-41°S (BirdLife 2018b). It breeds only on the high western plateau of Inaccessible Island, Tristan da Cunha, St Helena (to UK).

Status

The species has experienced historic declines throughout its range though recent population estimates suggest an increasing trend. It is considered Vulnerable by the IUCN. An extrapolation from snapshot censuses conducted in waters off Brazil in 1997-1999 suggested a total population of 38,000 ± 7,000 (BirdLife 2018b). This population increase over time is thought to have been initiated by the eradication of pigs from Inaccessible Island. Between 1999-2004, the species may have increased by up to 45% (BirdLife 2018b), but the toll taken by bycatch in longline fisheries is poorly understood.

Management

Sea bird management measures are the same for birds captured in this fleet in ICCAT. Readers are directed to the management section above for sooty albatross.

Information

Seabird interactions were reported in logbooks (N = 45) but not at the species level. Observer data reported interaction of 8 individuals over the observed trips. While catch volumes of the fishery are not expected to impact the population, the lack of detailed species-specific information is a problem.

Great shearwater

Biology

Great shearwater (*Ardenna gravis*) adults begin a trans-equatorial migration each April, moving north-west to South America, up to Canada, past Greenland and onto the north-east Atlantic before returning south in November to the breeding islands (BirdLife 2021). The species breeds on sloping ground, mainly in areas of tussock grass or Phylica woodland. It feeds mostly on fish, squid and fish offal (attending trawlers, sometimes in large numbers), and also on crustaceans.

Status

The great shearwater is considered Least Concern by the IUCN. The global population is estimated to number more than 15,000,000 individuals, which equates to more than 10,000,000 mature individuals (BirdLife 2021). The population is suspected to be stable in the absence of evidence for any declines or substantial threats.

Management

Sea bird management measures are the same for birds captured in this fleet in ICCAT. Readers are directed to the management section above for sooty albatross.

Information

Seabird interactions were reported in logbooks (N = 45) but not at the species level. Observer data reported interaction of 3 individuals over the observed trips. Given the lack of species-specific data collection from logbooks, it is unknown how many individuals the fishery would have interacted with.

Atlantic yellow-nosed albatross

Biology

The Atlantic yellow-nosed albatross (*Thalassarche chlororhynchos*) is a large seabird that nests in colonies on islands in the mid-Atlantic, including Tristan da Cunha and Gough Island. At sea they range across the South Atlantic from South America to Africa between 15°S and 45°S. They lay their eggs between September and October and resulting chick fledge from late March through to May.

Status

The population trend is decreasing. Population counts from 11 representative areas of Gough Island (approximately 5% of breeding habitat) indicate a decline of 2-3% per year, similar to population modelling with 20 years of demographic data (1982-2001) which predicted annual rates of decrease of between 1.5-2.8% on Gough Island and 5.5% on Tristan da Cunha (Cuthbert et al. 2003), and overall declines are estimated to exceed 70% over 72 years (three generations).

On Gough Island, the population was estimated at 5,300 breeding pairs in 2000-2001 (Cuthbert and Sommer 2004). In 2015, the number of breeding pairs in the Tristan da Cunha group was estimated to be 15,250 on Tristan da Cunha Island, 4,000 on Nightingale Island in 2007, 40 on Middle Island in 2010, 210 on Stoltenhoff Island in 2009 (Fraser et al. 1988, Ryan and Ronconi 2011, RSPB unpubl. data), equating to 52,000 mature individuals (range: 35,000-73,500).

One of the significant threats facing the yellow-nosed albatross is mortality resulting from interactions with fishing gear, especially during longline- and trawl-fishing operations. Based on stock status the IUCN lists the species as endangered and it is listed on Appendix 1 under the Agreement on the Conservation of Albatrosses and Petrels (ACAP).

Management

Sea bird management measures are the same for birds captured in this fleet in ICCAT. Readers are directed to the management section above for sooty albatross.

Information

Seabird interactions were reported in logbooks (N = 45) but not at the species level. Observer data reported interaction of 11 individuals over the observed trips. While catch volumes of the fishery are not expected to impact the population, the lack of detailed species-specific information is a problem.

Black-browed Albatross

Biology

The black-browed albatross (*Thalassarche melanophris*) species feeds mainly on crustaceans, fish, and squid, and also on carrion and fishery discards (BirdLife 2018e). The exact composition of its diet varies depending on locality and year (ACAP 2009).

Status

The black-browed albatross is considered Least Concern by IUCN. This species has an extremely large range, the population size is extremely large and appears to be increasing. The global population estimate is c.700,000 pairs, which equates to 1,400,000 mature individuals.

Management

Sea bird management measures are the same for birds captured in this fleet in ICCAT. Readers are directed to the management section above for sooty albatross.

Information

Seabird interactions were reported in logbooks (N = 45) but not at the species level. Observer data reported interaction of 11 individuals over the observed trips. However, based on the number taken, it is unlikely to impact the species population.

Wandering albatross

Status

The wandering albatross (*Diomedea exulans*) is considered vulnerable by the IUCN. Overall past and predicted future declines amount to a rapid population reduction over a period of three generations, qualifying the species as Vulnerable. At South Georgia, this species is undergoing a rapid decline over three generations (70 years). Longline fishing s likely to be the main cause of decline in this species, causing reductions in adult survival and juvenile recruitment, and this threat is on-going. There are an estimated 20,100 mature individuals globally.

Management

Sea bird management measures are the same for birds captured in this fleet in ICCAT. Readers are directed to the management section above for sooty albatross.

Information

Seabird interactions were reported in logbooks (N = 45) but not at the species level. Observer data reported interaction of 4 individuals over the observed trips. Given the lack of species-specific data collection from logbooks, it is unknown how many individuals the fishery would have interacted with. While catch volumes of the fishery are not expected to impact the population, the lack of detailed species-specific information is a problem.

Marine mammals

A single marine mammal was registered as taken (this aligned both with logbook and observer data). This species was the common bottlenose dolphin (*Tursiops truncatus*). It is considered Least Concern by the IUCN and capture in longline fisheries is not considered a major threat to this species' population status.

4.3.1.7 Habitat Impacts

Overview

When assessing the status of habitats and the impacts of fishing, teams are required to consider the full area managed by the local, regional, national, or international governance body(s) responsible for fisheries management in the area(s) where the UoA operates (this is called the "managed area" for assessment purposes).

According to MSC FCPV2.1 GSA 3.13.3, the assessment team must determine and justify which habitats are commonly encountered, vulnerable marine ecosystems (VMEs), and minor (i.e., all other habitats) for scoring purposes, [where]:

"A commonly encountered habitat shall be defined as a habitat that regularly comes into contact with a gear used by the UoA, considering the spatial (geographical) overlap of fishing effort with the habitat's range within the management area(s) covered by the governance body(s) relevant to the UoA; and A VME shall be defined as is done in paragraph 42 subparagraphs (i)-(v) of the FAO Guidelines (definition provided in GSA 3.13.3.2[2]) [as having one or more of the following characteristics: uniqueness or rarity, functional significance, fragility, Life-history traits of component species that make recovery difficult, and/or structural complexity]. This definition shall be applied both inside and outside EEZs and irrespective of depth."

Both commonly encountered and VME habitats are considered 'main' habitats for scoring purposes (GSA 3.13.3).

Habitat Type: Commonly Encountered

Pelagic longline fishery target albacore and other highly migratory species in the water column. The gear is suspended from floats with hooks about 60-100 meters below the surface. The gear does not come in contact with benthic habitat. The assessment team understands that lost gear is rare and when it is lost, it is usually retrieved because it is valuable.

The characteristics of the pelagic and mesopelagic habitat where the surface longline fishery operates targeting albacore in the North and South Atlantic are well known and have been researched over long periods by Spain and other coastal countries. Extensive bathymetry data on the Atlantic Ocean can be consulted in the GEBCO website (http://www.gebco.net/). The environmental characteristics of the Atlantic Ocean have also been widely studied by national institutions such as AZTI, IEO, CSIC (*Consejo Superior de Investigaciones Científicas*), or international institutions such as NOAA (National Oceanic and Atmospheric Administration). For example, NASA's OceanColor Web (http://oceancolor.gsfc.nasa.gov/cms/) is supported by the Ocean Biology Processing Group (OBPG) provide ocean-related products from a large number of operational, satellite-based remote-sensing

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[2] According to MSC FCPV2.1 GSA 3.13.3.2: VMEs have one or more of the following characteristic, as defined in paragraph 42 of the FAO Guidelines:

- Uniqueness or rarity – an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by similar areas or ecosystems
- Functional significance of the habitat – discrete areas or habitats that are necessary for survival, function, spawning/reproduction, or recovery of fish stocks; for particular life-history stages (e.g., nursery grounds, rearing areas); or for ETP species
- Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities
- Life-history traits of component species that make recovery difficult – ecosystems that are characterized by populations or assemblages of species that are slow growing, are slow maturing, have low or unpredictable recruitment, and/or are long lived
- Structural complexity – an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features"

missions providing ocean color, sea surface temperature and sea surface salinity data to the international research community since 1996.

Based on the Table GSA8, from MSC fisheries standard v2.01, there is little or no known bottom-contact by the gear, except perhaps in cases of gear loss. The species targeted cannot be caught using trawl or other bottom-contacting gear. The use of the gear, the understanding that comes from years of peer reviewed research about its impacts, and the specific management strategy that mandates only its use could be construed as a cohesive and strategic arrangement. This is supported by demonstrable understanding about how the use of pelagic longlines work to avoid impacting benthic habitats specifically, and some understanding about the impacts of lost gear on habitat and the relative effects of such impacts are deemed to be low risk for overall habitat health. Periodic assessments (i.e., directed research and risk assessments) are undertaken to inform management decision makers about lost gear impacts to ensure that management strategies are working and are demonstrably avoiding serious or irreversible harm to "main" habitats and to determine whether changes need to be made to mitigate unacceptable impacts.

Figure 27 and Figure 28 show the protected marine areas in the north and South Atlantic Ocean. The characteristics of each of these areas can be consulted in websites such as the MPAtlas website (http://mpatlas.org/explore/) or the Protected planet website (http://www.protectedplanet.net/). Protected habitats susceptible to being affected by the fleet being assessed are deep, which are unlikely to be impacted by surface longline fishing.

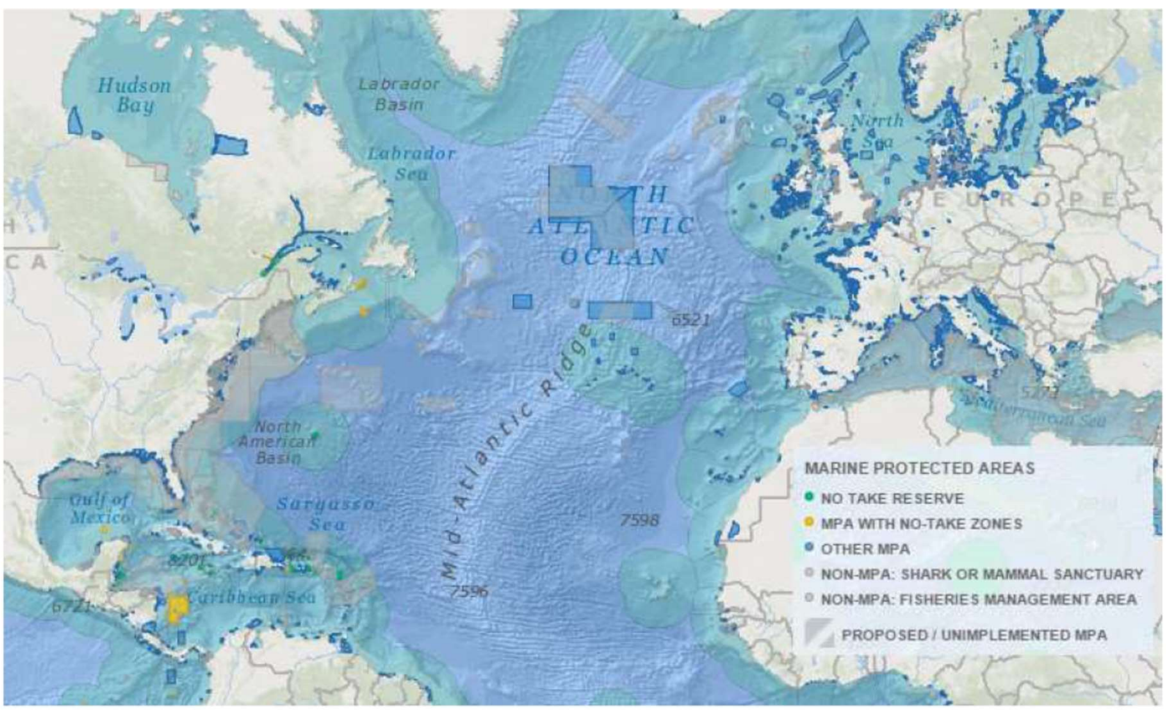

Figure 27. Marine protected areas in the North Atlantic Ocean, extracted from MPAtlas website (http://mpatlas.org/explore/)

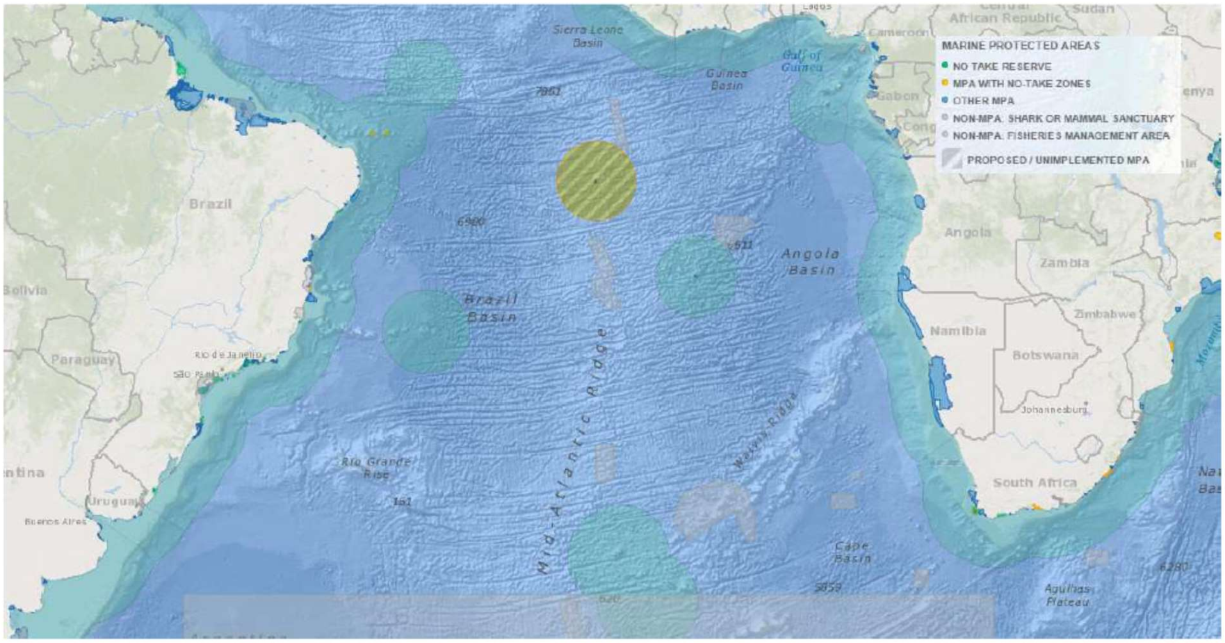

Figure 28. Marine protected areas in the South Atlantic Ocean, extracted from MPAtlas website (http://mpatlas.org/explore/).

Obviously, pelagic longline gear displaces biota from the space occupied by the gear, and it probably interferes with the movement of some organisms in the vicinity of the gear. However, these effects on pelagic habitat are temporary and the assessment team is not aware of any evidence of adverse impacts on the structure or functioning of either benthic or pelagic habitat. The fishery does not change the characteristics of the water column (for example, the temperature, salinity, currents) and it does not come into contact with benthic habitats.

4.3.1.8 Ecosystem Impacts

The Benguela Current Convention also establishes the Benguela Current Commission (BCC), existing since 2007, as a permanent inter-governmental organisation. The convention recognises the need for a Large Marine Ecosystem concept of ocean governance – a move towards managing resources at the larger ecosystem level (rather than at the national level) and balancing human needs with conservation imperatives necessary to maintain the productivity and biodiversity of this unique ocean system. The BCC is based in Swakopmund, Namibia, and is focused on the management of shared fish stocks, environmental monitoring; biodiversity and ecosystem health.

The pelagic longline fishery primarily targets large predatory fish, with the bulk of the catch by weight and numbers comprised of albacore tuna and other species such as tunas, billfish, escolar, oilfish, and dolphinfish. In addition, some shark and smaller pelagic species, sea birds and marine turtles are also caught. The fisheries under assessment take place within the water column with only limited contact on the bottom occurring with longline gear; therefore, ecosystem impacts are considered only to result from removal of species or functional groups from the system.

The impacts of the longline gear are considered minimal due to selective nature of the gear, but impacts from this gear associated with removal of albacore will also contribute to impacts of this species removal.

Ecosystem level impacts resulting from species or functional groups could include:

- Changes to the trophic relationships or structure;
- Changes to the size composition of the ecological community;
- Changes in biodiversity of the ecological community (e.g. alterations to species evenness and dominance) caused by direct or indirect effects of fishing; and
- Changes in the distribution of species.

A fishery can alter the structure and functioning of ecosystems through trophic interactions by removing forage species upon which higher trophic level species depend or through top-down trophic cascades. Based on the proportion of higher-level predators making up the largest proportion of bycatch species, we consider changes to trophic relationships or structure to be the most serious threat from the fishery to the ecosystem.

Much debate continues over the extent to which pelagic longline fisheries impact ecosystem function through removal of top or apex predators and the ability to predict associated impacts remains limited (Myers et al. 2007). The former mechanism is not applicable to this fishery because the fishery does not catch forage species. The second mechanism was described by Andersen and Pedersen (2009) using a size and trait-based model to explore how marine ecosystems might react to perturbations from different types of fishing pressure. They conclude that cascades are damped further away from the perturbed trophic level. Fishing on several trophic levels leads to a disappearance of the signature of trophic cascades. However, Pershing et al. 2015 suggests that trophic cascade regime shifts are rare in open ocean ecosystems and that their likelihood increases as the residence time of water in the system increases.

The ICCAT Sub-Committee on Ecosystems was created in 2005 to integrate the monitoring and research activities related to the ecosystem that are required by the SCRS in fulfilling its advisory role to the Commission, being the scientific cornerstone in support of an Ecosystem Based Fisheries Management (EBFM) approach in ICCAT.

The Sub-Committee's work will encompass the specific tasks listed below:

1) Monitoring:

- Create and maintain an inventory of species caught by fleets targeting tuna and tuna-like species in the Atlantic and Mediterranean.
- Improve conventional statistics (catch, effort, size) of ICCAT target species that are caught incidentally in non-targeted fisheries.

- Monitor and improve information on interactions with non-ICCAT target species, with emphasis on those species of interest to the Commission and for which no Species Group has been established (e.g., sea turtles and sea birds).
- Facilitate access by SCRS scientists to oceanographic and environmental data.

2) Research:

- Evaluate the relative impact of the different abiotic and biotic factors (including oceanographic and climate phenomena, directed and incidental fishing, predation, competition, pollutions and other human impacts) that affect the abundance, distribution and migration of ICCAT target species.
- Characterize main feeding and reproductive habitats of ICCAT target species. Characterize the volume, composition and disposition of non-target species that are caught incidentally in tuna and tuna-like fisheries within the Convention area.
- Investigate trophic interactions of ICCAT target species.
- Investigate the impact that changes in fishing gears or fishing technology have on the catch of target and non-target species.

3) Modeling:

- Develop reference points and indicators that explicitly incorporate ecosystem considerations.
- Develop simulation, dynamic and statistical models focusing on mixed-fisheries, multispecies, bycatch and ecosystem issues.

4) Advice:

- Develop mechanisms which can be used to better integrate ecosystem considerations into the scientific advice provided by SCRS to the Commission, including but not limited to, Precautionary Approaches. Work continues on the development of a "Ecosystem Report Card" that describes the state of the ecosystem and could potentially become an important component of ICCAT's plan to integrate Ecosystem-Based Fisheries Management (EBFM) into its assessment and management process.
- Investigate, through operational models, potential benefits (at an ecosystem level) of alternative management strategies, such as time-area closures.
- Advise on the impacts of tuna and tuna-like fisheries on the populations of non-target species of interest to the Commission
- Since 2007 the Sub-Committee on Ecosystems have an annual Inter-sessional Meeting.

Resolution 15-11, which went into force in 2015, expanded on earlier aspects of the ICCAT Convention by stipulating that when making recommendations pursuant to Article VIII of the ICCAT Convention, the Commission should apply an ecosystem-based approach to fisheries management. The Resolution provides further guidance that when implementing an ecosystem-based approach to fisheries management the Commission should a) consider the interdependence of stocks and species belonging to the same ecosystem or associated with or dependent upon target stocks; b) consider the impacts of fishing, other relevant human activities, and environmental factors on target stocks, non-target species and species belonging to the same ecosystem or associated with or dependent upon target stocks in the Convention area; and c) minimize negative impacts of fishing activities on the marine ecosystem. The ICCAT Sub-Committee on Ecosystems is working to provide the necessary tools to advance these requirements.

4.3.2 Principle 2 Performance Indicator scores and rationales

PI 2.1.1 – Primary species outcome

<table>
<tr><td colspan="2">PI 2.1.1</td><td colspan="3">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</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Main primary species stock status</td></tr>
<tr><td>Guide post</td><td>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.</td><td>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.</td><td>There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.</td></tr>
<tr><td>Met?</td><td>No. Atlantic UoA:
Bigeye tuna: Yes
Blue Shark: Yes

So. Atlantic UoA:
Blue shark: Yes</td><td>No. Atlantic UoA:
Bigeye tuna: No
Blue Shark: No

So. Atlantic UoA:
Blue shark: No</td><td>No. Atlantic UoA:
Bigeye tuna: Not scored
Blue shark: Not scored

So. Atlantic UoA:
Blue shark: No</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">Based on logbook data and observer data from 2016-2020 for the No. Atlantic UoA, bigeye tuna and blue shark are the only main primary species. In the So. Atlantic UoA, blue shark is the only main primary species based on logbook data from 2016-2019. Bigeye tuna in the Atlantic Ocean is managed by ICCAT and considered to be a single stock. Blue shark is considered a main primary species because it is managed by ICCAT, considered less resilient, and its catches are in excess of 2% by volume. Blue shark in the Atlantic Ocean is comprised of two stocks, a North Atlantic and South Atlantic, separated at the equator.

<u>No. Atlantic UoA</u>
<u>Bigeye Tuna (Atlantic)</u>
The latest stock assessment for bigeye tuna in the North Atlantic was conducted in 2018 using similar assessment models to those used in 2015 with updated data through 2017 and a new joint relative abundance (CPUE) index (ICCAT 2018f). Development of the joint standardized CPUE index was motivated to reduce data conflicts that can occur when modelling CPUE trends from different fleets in the same period. It was concluded that the joint index was an improvement over fleet-specific indices because of the integrated temporal and spatial coverage it afforded to index stock biomass, and because it minimizes data conflicts in the stock assessment models. Standardized indices of abundance were developed by national scientists for selected fleets</td></tr>
</table>

for which data were available at finer spatial and/or temporal resolutions and used in different stock assessment methods as sensitivity runs.

Stock status evaluations for Atlantic bigeye tuna in 2018 used several modelling approaches, ranging from non-equilibrium (MPD) and Bayesian state-space (JABBA) production models to integrated statistical assessment models (Stock Synthesis). Note that stock status is based on the stock synthesis model. Although the results of two production models, non-equilibrium and Bayesian state-space, are not used for management advice, they supported the Stock Synthesis stock assessment results.

The following elements are part of a strategy for bigeye tuna in the Atlantic Ocean and pertain to the evaluated fishery:

- ✓ Stock assessments are conducted every 4-6 years by the SCRS (revised and updated annually). This evaluation allows the Committee to establish the status of the resource and issue recommendations for its management.
- ✓ The ICCAT Recommendation 11-13 describes a general framework for decision making aimed at keeping stocks above the MSY level, of not being overfished and avoiding overfishing.
- ✓ For CPC vessels, effort limitations are in place and CPC vessels need to be authorised for fishing on tropical tunas. ICCAT has a list of registered authorised vessels (available on its website: https://www.iccat.int/en/vesselsrecord.asp)
- ✓ CPCs are required to report data to ICCAT annually; catch data (Task I) and catch-effort (Task II). A list of vessels flying their flag and fishing for bigeye and / or yellowfin tuna and / or skipjack in the Convention area is also required.
- ✓ A suite of FAD management measures are implemented; space-time closure in the Gulf of Guinea zone (now extended throughout the Convention Area), limit of 500 (reduced to 350 for 2020) FADs per vessel, management plans, specific data collection and submission of information. Additionally, ICCAT provides guidelines for the construction of non-entangling FADs. During the space-time closure the CPCs must ensure a 100% observer coverage as specified in Rec 16-01 and Rec 19-02.
- ✓ Recognition is given to fleets that implement voluntary observer programs outside the closure time/area. These programs provide ICCAT with data, which is collated and analysed by the SCRS.
- ✓ A port sampling program was developed by the SCRS with the goal of collecting tropical tuna fishery data of tuna captured in the geographic area of the space-time closure.
- ✓ Many of the monitoring and management measures detailed above are integrated into the Multiannual Conservation and Management Program for Tropical Tunas through Recommendation 19-02.
- ✓ During the period 2005-2008 an overall TAC was set at 90,000 t. The TAC was later lowered to 85,000 t. The TAC was again reduced to 65,000 t in Recommendation 15-01 which entered into force in 2016. The TAC was further reduced to 62,500 t in 2020 (Rec 19-02) and 61,500 t in 2021.
- ✓ Concern over the catch of small bigeye tuna partially led to the establishment of spatial closures to surface fishing gear in the Gulf of Guinea (Rec 04-01, Rec 08-01, Rec 11-01, Rec 14-01, Rec 15-01).

The TAC of 65,000 t established in 2016 was exceeded in 2016-2018 by 20% (i.e., catches around 77,000 t), which contributed to a further decline in stock size since the 2015 assessment. Since then, the TAC for bigeye tuna was lowered to 62,500 t in 2020 and 61,500 t in 2021 (Rec 19-02). The TAC for 2022 and future years will be reconsidered in November 2021 during the Commission Meeting on the basis of SCRS advice. In addition, given the life history characteristics of bigeye and the history of fishing on this bigeye stock, the stock has the potential to recover relatively quickly (within a 5–10-year period) with appropriate management measures (Medley et al. 2020).

Moreover, to reduce the fishing mortality of juvenile bigeye and yellowfin tunas, purse seine and bait-boat vessels fishing for, or vessels supporting activities to fish for bigeye, yellowfin and skipjack tunas in association with FADs in the high seas or EEZs was prohibited during a two- and three-month period, split into 2020 and 2021, respectively; 1 January to 28 February for 2020 and 1 January to 31 March in 2021, throughout the Convention area (Rec. 19-02). This will be reviewed and, if necessary, revised based on advice by the SCRS taking into account monthly trends in free school and FAD-associated catches and the monthly variability in the proportion of juvenile tuna in catches.

With these existing and updated developments in the management of bigeye, the assessment team considers there are measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding of bigeye tuna; SG 60 is met.

While the measures outlined above are expected to promote the rebuilding of bigeye, further testing is required to determine if the outcome meets the highly likely requirement. On this basis, SG80 is not met.

SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).

Blue Shark
The last North Atlantic blue shark assessment was conducted in 2015 using a BSP modelling platform. Based on the assessment results the stock is not overfished (B2013/BMSY=1.50 to 1.96) and overfishing is not occurring (F_{2013}/F_{MSY}=0.04 to 0.50). Estimates obtained with SS3 had higher uncertainties, but still predicted that the stock was not overfished (SSF_{2013}/SSF_{MSY}=1.35 to 3.45) and that overfishing was not occurring (F_{2013}/F_{MSY}=0.15 to 0.75). Combining results from the BSP and SS3 models, B_{2013}/B_{MSY}=1.35 to 3.45 and F2013/F_{MSY}=0.04 to 0.75 (Figure 17). Comparison of results obtained in the 2008 assessment and the current assessment indicated that, despite significant differences between inputs and models used (BSP and a catch-free age-structured production model), stock status results did not deviate substantially (B_{2007}/B_{MSY}=1.87-2.74 and F_{2007}/F_{MSY}=0.13-0.17). Stock status determination metrics from the 2015 North Atlantic Ocean blue shark stock assessment are listed in Table 24. Based on this information the stock is likely to be above the PRI; SG60 is met.

The SCRS acknowledged there remains a level of uncertainty in data inputs and model structural assumptions and based on this information the Assessment Team does not consider blue shark are highly likely to be above the PRI; SG80 is not met.

SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).

So. Atlantic UoA

Blue Shark

The latest South Atlantic blue shark assessment was conducted in 2015 using two modelling platforms, including productions model (Bayesian state space and Bayesian surplus production (BSP) models) and stock synthesis (SS3) (ICCAT 2015). Uncertainty in data inputs and model configuration was explored in the latest assessment through sensitivity analysis, revealing that the results were sensitive to structural assumptions of the model (ICCAT 2015). The production models had difficulty fitting the flat or increasing trends in the CPUE series combined with increasing catches. Overall, assessment results are uncertain (e.g., level of absolute abundance varied by an order of magnitude between models with different structures) and should be interpreted with caution. Given the difficulty in determining current stocks status, in particular absolute population abundance for South Atlantic blue shark, the SCRS considered that it was not appropriate to conduct quantitative projections of future stock condition.

The BSP estimated that the stock was not overfished (B_{2013}/B_{MSY}=1.96 to 2.03) and that overfishing was not occurring (F_{2013}/F_{MSY}=0.01 to 0.11). Comparison of results obtained in the 2008 and current assessment were similar for the BSP (B_{2007}/BMSY=1.95 and F_{2007}/F_{MSY}=0.04 for the 2008 base runs). Estimates obtained with the state-space BSP were generally less optimistic, especially when process error was not included, predicting that the stock could be overfished (B_{2013}/B_{MSY}=0.78 to 1.29) and that overfishing could be occurring (F_{2013}/F_{MSY}=0.54 to 1.19).

No analytical determination of the point where recruitment would be impaired (PRI) could be determined. According to GSA2.2.3.1: "In the case where neither BMSY nor the PRI are analytically determined, the following default reference points may be appropriate for measuring stock status depending on the species: B_{MSY}=40%B_0; PRI=20%B_0=½B_{MSY}".

Based on Table SA9 for PI 2.1.1, the probability requirements to meet SG60 is ≥70th %ile, SG 80 is ≥ 80th %ile and to SG100 is ≥ 90th %ile.

Based on the South Atlantic blue shark assessment B2013 is at least 39% of initial biomass B_0 (B_{2013}/B_0 = 0.39-1.0) and on this basis the assessment team concluded that stock biomass is likely above PRI (20%B_0); SG 60 is met. The SCRS acknowledged there remains a high level of uncertainty in data inputs and model structural assumptions. Based on this information, it is not considered highly likely that blue sharks are above the PRI, and SG80 is not met.

SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).

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?			No. Atlantic UoA: Yellowfin tuna: No No. Atlantic Swordfish: No Atlantic blue marlin: No Atlantic white marlin: No So Atlantic UoA: Bigeye tuna: No Yellowfin tuna: No E. Atlantic Skipjack tuna: No W. Atlantic Skipjack tuna: No So. Atlantic Swordfish: No Atlantic blue marlin: No

				Atlantic white marlin: No So. Atlantic Shortfin mako shark: No

Rationale

Logbook and observer data information from 2016-2020 was used to determine minor primary species in both the North and South Atlantic UoAs. For many of the minor primary species both North Atlantic and South Atlantic Ocean stocks, as well as easterNo. Atlantic and westerNo. Atlantic Ocean stocks have been identified. For the No. Atlantic UoA, 4 minor primary species comprising 4 stocks are identified, including:

Yellowfin tuna (*Thunnus albacares*)
No. Atlantic Swordfish (*Xiphias gladius*)
Atlantic blue marlin (*Makaira nigricans*)
Atlantic white marlin (*Kajikia albida*)

For the So. Atlantic UoA, 7 minor primary species comprising 8 stocks are identified, including:

Bigeye tuna (*Thunnus obesus*)
Yellowfin tuna (*Thunnus albacares*)
E. Atlantic Skipjack tuna (*Katsuwonus pelamis*)
W. Atlantic Skipjack tuna (*Katsuwonus pelamis*)
S. Atlantic Swordfish (*Xiphias gladius*)
Atlantic blue marlin (*Makaira nigricans*)
Atlantic white marlin (*Kajikia albida*)
S. Atlantic Shortfin mako shark (*Isurus oxyrinchus*)

To facilitate a determination, all primary minor species have been grouped by UoA and the all-or-none approach to score the group was used by the assessment team. For scoring purposes, the most vulnerable species, Southern shortfin mako shark, was chosen to represent the group. A retention ban was put in place for the North Atlantic stock in 2021, and it is scored as an ETP.

The latest assessment of the status of North and South Atlantic stocks of shortfin mako shark was conducted in 2017 with updated time series of relative abundance and annual catches, life history metrics, and with the inclusion of length composition data (ICCAT 2017). While the status of both stocks varied based on the modelling platform used, the overall results were similar; there is a high probability that the stocks are both overfished and experiencing overfishing though the North Atlantic stock is considered to be in a greater state of decline.

ICCAT recommended that: "*Given that fishery development in the South predictably follows that in the North and that the biological characteristics of the stock are similar, there is a significant risk that this stock could follow a similar history to that of the North stock. If the stock declines it will, like the North stock, require a long time for rebuilding even after significant catch reductions. The ICCAT group recommended that, at a minimum, catch levels should not exceed the minimum catch in the last five years of the assessment (2011-2015; 2,001 t with catch scenario C1s) (ICCAT 2019).*"

Based on this information the assessment team concluded that stock biomass of shortfin mako shark is not highly likely to be above the PRI and based on the all-or-none approach all primary minor species do not meet SG 100.

References	
ICCAT 2017; ICCAT 2015; ICCAT 2019	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	No. Atlantic UoA: 60-79 So. Atlantic UoA: 60-79
Information gap indicator	
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
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?	**No. Atlantic UoA:** Bigeye tuna: Yes Blue Shark: Yes **So. Atlantic UoA:** Blue shark: Yes	**No. Atlantic UoA:** Bigeye tuna: No Blue Shark: No **So. Atlantic UoA:** Blue shark: No	**No. Atlantic UoA:** Bigeye tuna: Not scored Blue shark: Not scored Yellowfin tuna: No No. Atlantic Swordfish: No Atlantic blue marlin: No Atlantic white marlin: No **So. Atlantic UoA:** Blue shark: Not scored Bigeye tuna: No Yellowfin tuna: No E. Atlantic Skipjack tuna: No W. Atlantic Skipjack tuna: No So. Atlantic Swordfish: No Atlantic blue marlin: No Atlantic white marlin: No So. Atlantic Shortfin mako shark: No
Rationale				

The main primary species are bigeye tuna (in the No. Atlantic UoA) and blue shark (in the No. and So. Atlantic UoA). The preamble to the ICCAT Convention states that its objective is to maintain the populations of fishes at levels which will permit the maximum sustainable catch for food and other purposes. This applies to all species subject to ICCAT management, including bigeye tuna and blue shark, as well as all primary minor species.

When ICCAT determines management measures are necessary, ICCAT Rec. [11-13] specifies that "*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, […]*" and management measures shall be designed to result in a high probability of maintaining the stock within the green quadrant of Kobe plot (B>BMSY and F<FMSY). Additionally, ICCAT Rec. [15-12] clarifies that "*In applying a precautionary approach, the*

Commission should take measures to ensure that when limit reference points are approached, they will not be exceeded. If they are exceeded, the Commission should without delay take action to restore the stocks to levels above the identified reference points".

ICCAT has demonstrated that it will adopt management measures and rebuilding plans when necessary (e.g., bluefin tuna, swordfish, albacore, bigeye tuna, and blue and white marlin). The assessment team expects that, when deemed necessary, ICCAT will adopt appropriate management measures for all species, consistent with Rec. [11-13] and Rec [15-07] on the development of harvest control rules and of management strategy evaluation.

MSC specifies a "partial strategy" to represent a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. Further, MSC defines a "strategy" to represent a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome, and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification of fishing practices in the light of the identification of unacceptable impacts.

Specific measures in place for the primary main species, bigeye tuna and blue shark, follow.

Bigeye Tuna
Specifically, for bigeye tuna, ICCAT has adopted Recommendations 16-01 and 18-01 which specified:

- ✓ Total allowable catch for 2016-2019 set at 65,000 t for Contracting Parties and Cooperating non-Contracting Parties, Entities or Fishing Entities.
- ✓ Restricting the number of vessels fishing for bigeye tuna to those registered with ICCAT in 2005.
- ✓ Specific limits of number of longline boats; China (65), Taiwan (75), Philippines (5), Korea (14), EU (269) and Japan (231).
- ✓ Specific limits of number of purse seine boats; EU (34) and Ghana (17).
- ✓ No fishing with natural or artificial floating objects during January and February in the area encompassed by the African coast, 20º W, 5ºN and 4ºS.
- ✓ No more than 500 FADs active at any time by vessel.
- ✓ Use of non-entangling FADs.

Recognizing that the TACs for bigeye tuna were exceeded in 2016 and 2017, and that these overages significantly reduced the probability to reach the Convention objectives by 2028, ICCAT adopted Recommendation 19-02, a comprehensive multi-annual conservation and management program for tropical tunas. This recommendation replaces Recommendation 16-01, entered into force on June 20, 2020, and specified:

- ✓ A multi-annual management, conservation, and rebuilding program with the goal of achieving BMSY with a probability of more than 50% by 2034.
- ✓ Catch limits for bigeye tuna.
- ✓ Procedures for underage or overage of catch of bigeye tuna.
- ✓ Catch monitoring requirements.
- ✓ Development and submission of fishing and capacity management plan.
- ✓ Control measures (vessel registration, observes, IUU, and port sampling).
- ✓ Limitations on fishing capacity for tropical tunas.

- ✓ A Comprehensive FAD management plan, including management objectives, closure periods, limits on the number of FADs, reporting obligations, construction requirements (non-entangling and biodegradable), and submission of FAD management plans from CPCs.
- ✓ Management procedures/management strategy evaluation, including reviews of the current candidate management procedures.

For bigeye tuna the main conservation measures are catch monitoring and limits, control and capacity measures, FAD management plans, and establishment of a rebuilding program (which replaces harvest control rules and harvest strategies). There are measures in place that are expected to maintain or to not hinder rebuilding of bigeye at/to levels which are likely to be above the PRI. SG60 is met.

However, at this stage there is no evidence that the management strategy is responsive to the state of the stock and that the elements of the strategy work together towards achieving stock management objectives. It cannot be said that there is a partial strategy in place that is expected to maintain or to not hinder rebuilding of Bigeye at/to levels which are likely to be above the PRI. SG80 is not met.

SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).

Blue Shark

ICCAT has adopted Recommendations for sharks in general, as well as those for blue, shortfin mako, porbeagle shark. Rec. [04-10] (Recommendation by ICCAT concerning the conservation of sharks caught in association with fisheries managed by ICCAT) and Rec. [07-06] (Supplemental recommendation by ICCAT concerning sharks). These require collecting and maintaining complete Task 1 and Task 2 data, periodic stock assessments, the implementation of measures to reduce the mortality of the sharks, alignment of annual catches to MSY levels, correct identification of similar shark species and release requirements for porbeagle sharks.

Recognizing that Atlantic blue sharks are caught in large numbers in fisheries managed by ICCAT and that the recent stock assessment noted a high level of uncertainty in data inputs, as well as in model structural assumptions and, therefore, the possibility of the stock being overfished and overfishing occurring could not be ruled out, ICCAT adopted Recommendation 19-07 for North Atlantic blue shark and 19-08 for South Atlantic blue shark. The Recommendations specify:

- ✓ TAC and catch limits for Blue Shark;
- ✓ Requirements for recording and reporting of catch information;
- ✓ Undertaking of scientific research; and
- ✓ Potential plan for developing harvest control rules and biological reference points.

These points above constitute measures in place that are expected to maintain or to not hinder rebuilding of blue shark at/to levels which are likely to be above the PRI. SG60 is met.

While plans to develop harvest control rules and harvest strategies for blue shark are established, they have not been finalized nor are they in place. It cannot be said that there is a partial strategy in place that is expected to maintain or to not hinder rebuilding of blue shark at/to levels which are likely to be above the PRI. SG80 is not met.

SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).

Minor species

An all or nothing approach was adopted here, and the Southern shortfin mako shark used as the representative species.
Recommendations (measures) in place covering the shortfin mako (South stock) include:

- [95-02] Resolution by ICCAT on Cooperation with the Food and Agriculture Organization of the United Nations (FAO) with Regard to Study on the Status of Stocks and By-Catches of Shark Species
- [03-10] Resolution by ICCAT on the Shark Fishery
- [04-10] Recommendation by ICCAT Concerning the Conservation of Sharks Caught in Association with Fisheries Managed by ICCAT
- [10-06] Recommendation by ICCAT oNo. Atlantic Shortfin Mako Sharks Caught in Association with ICCAT Fisheries
- [13-10] Recommendation on Biological Sampling of Prohibited Shark Species by Scientific Observers
- [14-06] Recommendation by ICCAT on Shortfin Mako Caught in Association with ICCAT Fisheries

Effect of current regulations: While management measures are in place for the Northern shortfin mako stock (i.e., retention ban), no measures have been adopted for the southern stock. Scientists have recommended installing a TAC of 2,001 t per year to control exploitation (and avoid the southern stock mirroring the status of the northern stock), but no TAC has been implemented. There are no harvest control rules or harvest strategies which the assessment team deems necessary to meet the objectives of the Convention or to constitute a 'strategy'; SG 100 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?	**No. Atlantic UoA:** Bigeye tuna: Yes Blue shark: Yes **So Atlantic UoA:** Blue shark: Yes	**No. Atlantic UoA:** Bigeye tuna: No Blue shark: No **So Atlantic UoA:** Blue shark: No	**No. Atlantic UoA:** Bigeye tuna: Not scored Blue shark Not scored Primary minor: No **So Atlantic UoA:** Blue shark: Not scored Primary Minor: No

Rationale

<u>Primary Main</u>

The more recent adopted measures (overall TAC and CPC catch quotas, capacity management measures, size limits, seasonal closures, control measures, and reporting requirements) are standard fishery management actions that have a proven track record of controlling exploitation, SG 60 is met for all primary main species.

Based on recent assessments, bigeye tuna is overfished and there is considerable uncertainty with stock status determinations for North and South Atlantic blue shark despite adopted management measures over time being more "strict". Recommendation [19-02] established a comprehensive multi-annual conservation and

management program for bigeye tuna, including a rebuilding plan starting in 2020 and continuing through 2034, with the goal of achieving BMSY with a probability of more than 50%. Based on the comprehensive nature of Rec. [19-02], these measures are considered likely to work, based on plausible argument, and SG60 is met. However, the bigeye tuna stock is overfished and overfishing is occurring therefore at this stage no evidence exists that it is achieving its objectives, and it cannot be said there is some objective basis for confidence that the measures/partial strategy will work, SI(b) SG80 is not met. SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218). There are measures in place for blue shark that are considered likely to work based on plausible argument regarding stock assessments and implementing measures to reduce mortality. SG60 is met. While a multi-annual conservation and management program has been proposed for North and South Atlantic blue shark it has yet to specify harvest control rules and associated reference points. Thus, there is no objective basis for confidence that the current measures in place for blue shark will work; SG 80 is not met. SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218). As the status of many primary minor species are either depleted, unknown, or unreliable due to data deficiencies, and testing to determine the efficacy of management measures not conducted, there is no objective basis for confidence that the measures will work. On this basis SG 80 is not 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?		**No. Atlantic UoA:** All elements: No **So. Atlantic UoA:** All elements: No	**No. Atlantic UoA:** No **So. Atlantic UoA:** No
Rationale				
Multiple lines of evidence are available indicating that the measures/partial strategies are being implemented successfully, including stock assessments routinely carried out by the SCRS, collection of observer and logbook information, VMS data, and compliance with catch reporting obligations to ICCAT (Volume 4 of the 2018-2019 ICCAT Biennial Report). The preamble to the ICCAT Convention states that its objective is to maintain the populations of fishes at levels which will permit the maximum sustainable catch for food and other purposes. This has not been the case for the two primary main species and not the case for most of the primary minor species. While the pattern of Recommendations being drafted in response to changes in stock status of these species is consistent with fisheries management methodologies, the observed pattern includes the adoption of stricter management measures through time indicating that the adopted measures are not effective in obtaining the Convention’s objective. Given how RFMOs operate and recognizing that all adopted management measures are a compromise the observed outcomes are expected. Thus, it cannot be said that there is some evidence that the measures/partial strategy are implemented successfully, and SG 80 is not met.				

SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).

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?	**No. Atlantic UoA:** Yes **So Atlantic UoAs:** Yes	**No. Atlantic UoA:** No **So Atlantic UoAs:** No	**No. Atlantic UoA:** Not scored **So Atlantic UoAs:** Not scored

Rationale

Based on logbook and observer data from 2016-2020 blue shark is classified as a primary species, Recommendation 04-10 prohibits the finning of sharks, defined as the removal of fins and discarding the carcass. Additionally, CPCs shall take the necessary measures to require that their fishermen fully utilize their entire catches of sharks if retained. Full utilization is defined as retention by the fishing vessel of all parts of the shark excepting head, guts and skins, to the point of first landing. For vessels retaining sharks, CPCs shall require their vessels to not have onboard fins that total more than 5% of the weight of sharks onboard, up to the first point of landing. No issues of non-compliance were noted in the Taiwan UoA and no incidents of shark finning observed in the Taiwan provided logbook and observer data sets. Additionally, Recommendation 18-06 requires comprehensive reporting by CPCs on their implementation of ICCAT shark measures, while Recommendations 19-07 and 19-08 establish conservation measures and reporting requirements specific to North Atlantic and South Atlantic blue sharks caught by ICCAT fisheries, including the setting of annual TACs and catch limits. We also note that Taiwan, along with other CPCs, voluntarily adopted a fins-naturally-attached policy in the Atlantic Ocean that requires all vessels retaining sharks to land them with fins naturally attached to the body.

MSC provides guidance on the acceptable levels of external validation required to demonstrate the likelihood that shark finning is not taking place (SA2.4.4.1). As it relates to observer coverage, at least 5% observer coverage is required as acceptable evidence to meet SG60 and "the percentage of on-board observer coverage generally refers to coverage of total fishing effort of all vessels in the UoA." Observer longline coverage rates in the Atlantic Taiwanese longline fishery from 2014-2019 ranged from 6.56% to 9.42%, meeting the criterion of external validation at the SG60 level (ICCAT 2015b, ICCAT 2016b, ICCAT 2018e, ICCAT 2020b). Based on this information, as well as existing measures in place (Recommendations 04-10, 18-06, 19-07, and 19-08), Taiwan's voluntary adoption of a fins-naturally-attached policy, and no cited non-compliance regarding shark finning by the UoA the assessment team considers it is likely that shark finning is not taking place and SG 60 is met.

Regarding other measures in place, DiNardo et al. (2021) interviewed Taiwanese Fishing Masters and Port Managers to gather additional qualitative evidence to determine the extent to which port sampling and/or port inspections conducted at the specified landing sites for the UoC could detect shark finning activities. Interviewed participants noted that inspections are routinely conducted, although less so in recent years due to COVID-19, which is consistent with implementation of the Port State Measures Agreement and the Taiwan Distant Water Fishing Act at relevant landing sites. However, the DiNardo et al. (2021) cited a current lack of evidence to suggest that inspectors have full access to vessels at the point of offload at all landing sites and therefore is not consistent with MSC Guidance SA2.4.4.1.

As per MSC Guidance SA2.4.4.1 to meet SG80 requirements, an equivalent to 20% nominal observer coverage is required. Given that low observer coverage rates in the Taiwan longline fleet are less than 20%, it cannot be stated with confidence that it is highly likely that shark finning is not taking place. On this basis SG 80 is not met.

SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).				
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 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 primary species, and they are implemented, as appropriate.
	Met?	**No. and So. Atlantic UoAs:** All elements: Yes	**No. and So. Atlantic UoAs:** All elements: Yes	**No. and So. Atlantic UoAs:** All elements: No
Rationale				
Resolution [05-08] encourages all Contracting Parties, Cooperating non-Contracting Parties, Entities, and Fishing Entities (CPCs) to undertake research trials of appropriate-size circle hooks in commercial pelagic longline fisheries. Both blue marlin and white marlin are currently under a rebuilding plan and the use of circle hooks has been experimentally shown to significantly reduce their post-release mortality. Recommendation [19-07] encourages CPCs to undertake scientific research that would provide information on post-release survivorship and behavioural traits of released blue sharks and such information be reviewed and discussed at SCRS meetings. CPCs are required to use non-entangling FADs and further research on non-entangling FADs is encouraged to mitigate the catch of sharks, sea turtles, marine mammals, and non-target species (including juvenile tropical tunas); all research shall be made available to the SCRS for review and discussion. Recommendation [19-02] stipulates analyses be conducted to determine the efficacy of reducing the catch of juvenile tropical tunas through closures. Safe handling and release protocols for blue shark and billfish are consistently reviewed and updated appropriately and Recommendation [18-04] stipulates that CPCs shall work to minimize the post-release mortality of marlins/spearfish. There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality or unwanted catch of main primary species and SG60 is met. Furthermore, based on information described above, the assessment team concludes 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 are implemented as appropriate; SG 80 is met. As there is not a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species within ICCAT SG 100 is not met.				
References				
MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range	No. Atlantic UoA: 60-79 So. Atlantic UoA: 60-79			

Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

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?	**No. and So. Atlantic UoAs:** All elements: Yes	**No. and So. Atlantic UoAs:** All elements: Yes	**No. and So. Atlantic UoAs:** All elements: No
Rationale				
Quantitative information is collected via observer programs and logbooks for the No. Atlantic and So. Atlantic UoAs and information from 2016 to 2020 was provided to the assessment team. This meets the requirements at SG60 for qualitative information being adequate to estimate impact of UoA on primary main species. The overall level of observer coverage is low in both UoAs and temporal coverage of vessels was minimal and not consistent between years. Furthermore, for the North UoA, there appears to be a discrepancy in the observed fishing activity (compared to logbook data) given the dominant catch of bigeye reported by observer data, as opposed to albacore for logbook data. Thus, the observer data alone may not be representative of actual catches, but when combined with logbook data the reported catches are likely to be representative. On this basis some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status; SG 80 is met. Due to the low observer coverage and unknown coverage of logbooks, information is not adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status; SG 100 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?			**No. and So. Atlantic UoAs:** All elements: Yes

Rationale				
Quantitative information is available for all primary minor species allowing stock assessment to be conducted and stock status with respect to biologically based limits to be determined. Catch (retained and discarded) information is collected via mandatory observer programs and logbooks from all fisheries operating in the ICCAT area, including UoA vessels. While observer coverage for both UoAs was low between 2016 and 2020, logbook information is available for all vessels in the UoA, and this quantitative information is considered adequate to estimate the impact of the full UoA on minor primary species with respect to status. On this basis SG 100 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?	**No. and So. Atlantic UoAs:** All elements: Yes	**No. and So. Atlantic UoAs:** All elements: No	**No. and So. Atlantic UoAs:** All elements: Not scored
Rationale				

ICCAT requires annual reporting of catches and associated fishing effort by CPC and fishery. Size data is collected annually, and stock assessments are routinely conducted for key species. This information supports management decision making by ICCAT. Stock assessments are routinely conducted for all primary species in this assessment on this basis information is adequate to support measures to manage main primary species; SG 60 is met.

Recommendation [19-02] established a comprehensive multi-annual conservation and management program for bigeye tuna, including specified catch limits, reporting requirements, capacity and control measures, fishing plan, FAD measures, and a rebuilding plan starting in 2020 and continuing through 2034, with the goal of achieving BMSY with a probability of more than 50%. However, as this Recommendation just entered into force there is no information to determine and assess adequacy. On this basis SG 80 is not met for bigeye tuna And SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).

Recommendation 19-07 for North Atlantic blue shark and 19-08 for South Atlantic blue shark specified catch limits, requirements for recording and reporting of catch information, need to undertake scientific research, and potential plans for developing harvest control rules and biological reference points. While plans to develop harvest control rules and harvest strategies for blue shark are established, they have not been finalized nor are they in place. The suite of measures that have been adopted but given the uncertainty in recent information considered through ICCAT, the assessment team believes the information is adequate to support measures to manage main primary species (reaching SG60) but information is not is not adequate to support a partial strategy in place for blue sharks for both the northern and southern stocks. On this basis SG 80 is not met. SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).

While quantitative stock assessments have been conducted for all primary minor species, the results were unclear for some species due to scant input data. As a result, projections to evaluate the efficacy of measures could not be conducted for some species. On this basis information is not 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; SG 100 is not met.

References	
MSC interpretation: https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	No. and So Atlantic UoAs: 60-79
Information gap indicator	Information is sufficient to score this PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

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?	**No. Atlantic UoA:** Indian oil sardine: Yes **So. Atlantic UoA** Indian oil sardine: Yes Bali sardinella: Yes	**No. Atlantic UoA:** Indian oil sardine: Yes **So. Atlantic UoA** Indian oil sardine: Yes Bali sardinella: Yes	**No. Atlantic UoA:** Indian oil sardine: No **So. Atlantic UoA** Indian oil sardine: No Bali sardinella: No
Rationale				
The only main secondary species are the bait species: Indian Oil Sardine in both UoAs, and Bali sardinella in the South Atlantic. **Bait Species** **Indian oil sardine**				

The fishery uses Indian oil sardine (*Sardinella longiceps*), sourced from China and Russia. The largest source fishery for this bait is India, and the team has assumed this as the source. It is a highly migratory small pelagic fish distributed on the entire west coast of India from Gujarat to Kerala, and on Tamil Nadu, Pondicherry, Andhra Pradesh and Orisha in the Indian east coast, but the highest abundance is observed off Kerala and Karnataka coasts (FishSource 2022). It is most likely the bait originates from either Indian, Pakistani, or Omani coastal waters where commercial fisheries for this species exist.

The population size is highly variable and impacted by environmental fluctuations, observed by the large variability in FAO reported landings. Fishery output and population parameters are being monitored by the Central Marine Fisheries Research Institute (CMFRI) and used as a proxy for stock survey (Andrews et al. 2008). Rapid stock assessments are conducted frequently for all coastal states by the CMFRI (FishSource 2022).

A stock assessment was carried out for Indian oil sardine in Oman in 2013 (Zaki et al. 2013), reporting an average annual yield at 2,732 tonnes with MSY at 2,886 t. Considering the UoA uses on average 2,500 tonnes annually, the team considered it highly unlikely that this predominantly artisanal fishery with such low yield was the source of the bait. For the Pakistani stock, a stock appraisal was carried out in 2016 (Baset et al. 2017). The average annual landings of Indian oil sardine stocks were 38,353 t while the highest and lowest 65,050 t in 1994 and 26,937 t in 2009 was recorded correspondingly, below the estimated MSY values. Among the five nations which harvest oil sardine (0.572 million tons) from their coastal waters, India's average production is the highest with 65% (376,189 t) followed by Oman, 63,439 t, Yemen, 58,839 t, Iran, 45,800 t, and Pakistan, 27,372 t (FAO, 2016). Major catches (representing >98.5% of the total catches in India including all gears) in the last years occurred off Maharasthra, Goa, Karnataka, Kerala, Tamil Nadu and Andhra Pradesh, whereas catches off Gujarat, Pondicherry, Odisha and West Bengal were much less important (<4000 tons/year; representing <1.5% of the total catches in India including all gears) (analysis presented on FishSource.org, based on CMFRI annual reports). Stock assessments are conducted at the state level and with the exception of Karnataka, considered 'Less abundant' as of 2016, all are either abundant or underexploited (2017).

Given that the client provided annual bait use data for 20 out of the 30 total Taiwanese vessels licensed to fish for albacore in ICCAT, extrapolating reported bait data to the entire fishery would result in 1,500 mt Indian Oil Sardine used annually, which consists of <0.3% of the total annual landings from Indian waters. Based on this volume, it is highly likely the Indian oil sardine is above biologically based limits, SG60 and 80 are met. However, given that the source origin is unknown, there is not a high degree of certainty that the Indian oil sardine is above biologically based limits, and SG100 is not met.

This score is harmonized with the SZLC CSFC & FZLC FSM EEZ Longline Yellowfin and Bigeye Tuna Fishery Public Certification Report (Sieben et al. 2018).

Bali sardinella

The exact origin of Bali sardinella (*Sardinella lemuru*) used as bait by the UoA is known, but the UoA sources it from Japan. It is a coastal small pelagic, schooling, strongly migratory species that inhabit tropical waters of the Indo-Pacific region (Fishsource 2022, Figure 25). It is abundant in parts of its range (i.e., the Philippines and Indonesia) and contributes significantly to industrial and commercial sardine fisheries throughout a majority of its range. PSA data from 2002-2020 for Bali sardinella (*tamban*) showed that it comprised on average of 12% of total national

landings making it in the top two fisheries resource in the Philippines (OpenSTAT). Stock assessments have been conducted in regions across its range (e.g. Gaughan et al. 2000; Purwaningsih et al. 2011). It has experienced overfishing in the past and is currently considered overfished in parts of its range (i.e., east Java, Indonesia and the Philippines). Total landings of Bali sardinella in 2019 exceeded 287,000 mt, with 85% of the catch from the Philippines and the remainder from Indonesia (FAO fish stat J). Thus, the assessment team considers it likely that the bait originated from the Philippines. Stock assessments have been conducted in parts of its range. In the Philippines, the latest stock assessment estimated an optimum exploitation rate (E) of 0.6 for all small pelagic stocks, the value set as the Limit Reference Point (LRP) for these fisheries and E = 0.40 as the minimum exploitation rate. The stock assessment found that stock is performing well in some of its range, but over-exploited in certain areas (e.g., Camotes Sea). Given that the client provided annual bait use data for 20 out of the 30 total Taiwanese vessels licensed to fish for albacore in ICCAT, extrapolating reported bait data to the entire fishery would result in 1,314 mt Bali sardinella used annually. Since the stock origin of the bait species is unknown, it is possible that it may be below biological limits. Since this species comprises <10% of the catch volume, it is classified as 'considerable.' The assessment team is not aware of any other MSC certified fisheries that use this bait in 'considerable' quantities. The UoA's annual bait usage accounts for <0.005% of the total annual catch of the species. This limited volume used by the fishery can be considered a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. SG80 is met. However, given that the source origin is unknown, there is not a high degree of certainty that the species is above biologically based limits, and SG100 is not met.				
b	Minor secondary species stock status			
	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?			**No. And So. Atlantic UoAs:** All elements: No
Rationale				
Catch information for secondary minor species was derived from logbook data from No. and So. Atlantic UoAs from 2016-2020. While the catch of many secondary minor species was minimal (i.e., <0.1% of total catch), it should be noted that all secondary minor species are considered data poor, and, as such, information on stock status is not available. Given the data poor status of the secondary minor species, the assessment team cannot conclude that all minor secondary species are highly likely to be above biologically based limits and took a more precautionary approach when scoring so SG 100 is not met.				
References				
Gaughan et al. 2000, Andrews et al. 2008, Purwaningsih et al. 2011, Zaki et al. 2013, Baset et al. 2017, FishSource 2022, FishStat J 2022.				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	Secondary minor species: ≥ 80 Indian oil sardine: ≥ 80 Bali sardinella: ≥ 80
Information gap indicator	Comprehensive information of bait species, including origin (geographic location) and any additional stock status indicators.
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

Scoring Element	**SI a**	**SI b**	**PI Score**
Indian oil sardine	≥80	n/a	≥80
Bali sardinella	≥80	n/a	
Secondary Minor	n/a	≥80	

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?	**No. Atlantic UoA:** Indian oil sardine: Yes **So. Atlantic UoA** Indian oil sardine: Yes Bali sardinella: Yes	**No. Atlantic UoA:** Indian oil sardine: Yes **So. Atlantic UoA** Indian oil sardine: Yes Bali sardinella: Yes	**No. Atlantic UoA:** Indian oil sardine: No All secondary minor elements: No **So. Atlantic UoA** Indian oil sardine: No Bali sardinella: No All secondary minor elements: No

Rationale

The only main secondary species are the bait species, Indian oil sardine and Bali sardinella. These bait species are particularly difficult to manage given that their dynamics and biomass trajectories are directly linked to environmental conditions.

Indian oil sardine

The Indian oil sardine is sourced from China and Russia but believed to be from waters in India. The volume of bait used by the fishery is small in comparison to the total landings and biomass for the most likely target stock.

There are several management measures and partial strategies in place for the Indian oil sardine fishery (FishSource 2022), including:

- Rapid stock assessments are conducted frequently for all coastal states by the Central Marine Fisheries Research Institute of India (CMFRI).
- The monsoon fishing ban in territorial waters has been recently extended in duration (from 45 to 61 days) and includes all vessels except traditional non-motorized units.
- Managements measures include prohibitions on certain fishing gear, regulations on mesh size, establishment of closed seasons and areas, demarcations of zones for no-trawling.

- A rapid stock assessment conducted in 2016-2017 suggest that the oil sardine populations off Andhra Pradesh are in good health although this assessment is now considered outdated as it is older that the generation time of the species (1 yr).

Despite these strengths, there are several weaknesses that have been outlined by FishSource, the key ones include:

- Assessment is not conducted at the stock level since the number and geographical limits of oil sardine stocks in India is not clearly understood.
- The quality of the rapid stock assessments conducted by CMFRI cannot be evaluated based on the information provided by the CMFRI.
- Presently no clearly stated long-term objectives are established for this fishery. Oil sardine in India is not managed through quotas or total allowable catches.
- There are no formal or routine arrangements in place to create a link between scientific findings.
- There are concerns in all the country that if the level of fishing effort remains unchecked, the fleet may grow to exceed sustainable levels.
- Long time series of state-wise catch data are not publicly available, and the CMFRI website provides catch data only for the last 5 years.
- A minimum landing size for oil sardine has not been set in spite of recent scientific recommendations suggesting that this would be advisable in all Indian maritime States.

As stated in PI2.2.1a, the volume of Indian oil sardine used by the UoA accounts for a fraction of annual landings. There are considered measures in place to maintain/not hinder rebuilding of main secondary species, SG60 is met. The minimal volume used and combined with the fact the UoA is tracking bait usage means that there is a partial strategy 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, reaching SG80. However, this does cannot be considered a cohesive and strategic arrangement based on an understanding of how these measures work to manage impact on the component specifically. SG100 is not met.

Bali sardinella
As with Indian oil sardine, the volume of bait used by the fishery is small in comparison to the total landings and biomass for the most likely target stock (<0.005% of total landings).

The origin for the Bali sardinella used by the fishery is not known, though it given that 85% of the catch from the Philippines, the assessment team considers it the most likely country of origin. The relative management strengths are described by FishSource (2022) as:

- A National sardine management plan (NSMP 2020-2025) to improve the sardine production sector, both at the commercial and municipal level in the Philippines is currently in place.
- Examples of management measures in Indonesia include for Bali, the number of vessels is limited (190 in East Java, 83 units in Bali) and vessels size cannot exceed 30 GT (Purwaningsih et al. 2011).
- Exploitation rate at E=0.6 as limit reference point for this fishery.
- Some management measures established in accordance with the Fisheries Code.
- Marine protected areas (MPAs) established.

The main weaknesses include:

- The last stock assessment available is based on data from 2015.
- No harvest control rules or TACs established for this fishery.

- There are still non-compliance practices taking place in this fishery.
- There is no information on possible effects of the fishery in the environment (e.g., ETP, bycatch, habitats, ecosystems).

There are considered measures in place to maintain/not hinder rebuilding of main secondary species and SG60 is met. The minimal volume used and combined with the fact the UoA is tracking bait usage means that there is a partial strategy that is expected to maintain or not hinder rebuilding of Bali sardinella at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery, reaching SG80. However, this does cannot be considered a cohesive and strategic arrangement based on an understanding of how these measures work to manage impact on the component specifically. SG100 is not met.

All Secondary Minor Species

Most of the secondary minor species are data poor. Assessments have not been conducted and there are no management strategies in place. On this basis SG 100 is not met as there is no strategy in place for managing main and minor secondary species.

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/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?	**No. Atlantic UoA:** Indian oil sardine: Yes **So. Atlantic UoA** Indian oil sardine: Yes Bali sardinella: Yes	**No. Atlantic UoA:** Indian oil sardine: Yes **So. Atlantic UoA** Indian oil sardine: Yes Bali sardinella: Yes	**No. Atlantic UoA:** Indian oil sardine: No All secondary minor elements: No **So. Atlantic UoA** Indian oil sardine: No Bali sardinella: No All secondary minor elements: No

Rationale

Indian oil sardine & Bali sardinella
The measures/partial strategy employed by the UoA includes the tracking of annual bait volumes and the minimal use of bait in relation to total annual landings. Measures are considered likely to work, reaching SG60, and there is an objective basis of confidence that these measures/partial strategy will work based on the species involved (i.e. short life history, highly fecund), reaching SG80 for both species. However, there has not been any testing to support high confidence, and the uncertainty regarding the exact source area of bait means that SG100 is not met for either species.

Secondary Minor Species

Most of the secondary minor species are data poor. As such, no assessments have been conducted and no strategies proposed. Therefore, no testing has been conducted to support a high confidence that the partial

strategy/strategy will work, based on information directly about the UoA and/or species involved. On this basis SG 100 is not 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 objective as set out in scoring issue (a).
	Met?		**No. Atlantic UoA:** Indian oil sardine: Yes **So. Atlantic UoA** Indian oil sardine: Yes Bali sardinella: Yes	**No. Atlantic UoA:** Indian oil sardine: No All secondary minor elements: No **So. Atlantic UoA** Indian oil sardine: No Bali sardinella: No All secondary minor elements: No
Rationale				
Indian oil sardine & Bali sardinella The quantity of bait used is known, as are total landings from the most likely source stocks and there is some evidence that measures/partial strategy are being implemented successfully. SG80 is met. In the absence of a strategy or a partial strategy which also covers minor species and better information on the specific source stocks for Indian oil sardine and Bali sardinella, SG100 is not met since there is not clear evidence of successful implementation to achieve overall objectives set out in scoring issue a.				
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?	**No. and So. Atlantic UoAs:** Yes	**No. and So. Atlantic UoAs:** No	**No. and So. Atlantic UoAs:** No
Rationale				
Secondary minor sharks include common thresher shark, crocodile shark, and longfin mako shark. Catch volumes of all secondary minor sharks are low, less than 0.01%. Recommendation 04-10 prohibits the finning of sharks, defined as the removal of fins and discarding the carcass. Additionally, CPCs shall take the necessary measures to require that their fishermen fully utilize their entire catches of sharks if retained. Full utilization is defined as retention by the fishing vessel of all parts of the shark excepting head, guts and skins, to the point of first landing. For vessels retaining sharks, CPCs shall require their vessels to not have onboard fins that total more than 5% of the weight of sharks onboard, up to the first point of landing. No issues of non-compliance were noted in either the North Atlantic or South Atlantic UoAs and no incidents of shark finning were observed in the logbook or observer data sets. Observer coverage of the Taiwan longline UoA operating in the Atlantic Ocean from 2016-2020 is reported to range from 6.56% to 9.42%				

and is above the required 5% coverage rate stipulated by ICCAT and MSC SA2.4.4.1 to assume it is likely that shark finning is not taking place. On this basis SG60 is met.

In an MSC assessment of other Taiwanese longline vessels that targeted albacore in the North and South Atlantic, DiNardo et al. (2021) interviewed Taiwanese Fishing Masters and Port Managers to gather additional qualitative evidence to determine the extent to which port sampling and/or port inspections conducted at the specified landing sites for the UoC could detect shark finning activities. Interviewed participants noted that inspections are routinely conducted, although less so in recent years due to COVID-19, which is consistent with implementation of the Port State Measures Agreement and the Taiwan Distant Water Fishing Act at relevant landing sites. However, DiNardo et al. (2021) concluded there was currently insufficient evidence to suggest that inspectors have full access to vessels at the point of offload at all landing sites and therefore is not consistent with MSC Guidance SA2.4.4.1.

As per MSC Guidance SA2.4.4.1 SG80 requires 20% coverage. Given the low observer coverage rates in the Taiwanese longline fleet and in both UoAs, it cannot be stated with confidence that it is highly likely that shark finning is not taking place. On this basis SG 80 is not met.

To meet the SG100 scoring level requirements outlined for the SG80 scoring level must be met, as well as imposed port measures and port inspections to address shark finning. As a result, SG100 is not 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?	**No. and So. Atlantic UoAs:** Indian oil sardine: Yes Bali sardinella: Yes	**No. and So. Atlantic UoAs:** Indian oil sardine: Yes Bali sardinella: Yes	**No. and So. Atlantic UoAs:** Indian oil sardine: Yes Bali sardinella: Yes All secondary minor species: No

Rationale

Indian oil sardine & Bali sardinella
For all bait species, from the source fisheries there is no unwanted catch as no size limits apply and all fish captured are marketed SG60 and SG80 is met. Within the UoA the bait purchase decision is made based on quality and price by the sourcing staff who is consistently (annually) reviewing the most reasonable bait supply in the market. As only the required bait volume is purchased each year there is no unwanted catch and SG 100 is met.

Secondary Minor Species
Resolution [05-08] encourages all Contracting Parties, Cooperating non-Contracting Parties, Entities, and Fishing Entities (CPCs) to undertake research trials of appropriate-size circle hooks in commercial pelagic longline fisheries. Both blue marlin and white marlin are currently under a rebuilding plan and the use of circle hooks has been experimentally shown to significantly reduce their post-release mortality. Recommendation [19-07] encourages CPCs to undertake scientific research that would provide information on post-release survivorship and behavioural traits of released sharks and such information be reviewed and discussed at SCRS meetings.

CPCs are required to use non-entangling FADs and further research on non-entangling FADs is encouraged to mitigate the catch of sharks, sea turtles, marine mammals, and non-target species (including juvenile tropical tunas); all research shall be made available to the SCRS for review and discussion. Recommendation [19-02] stipulates analyses be conducted to determine the efficacy of reducing the catch of juvenile tropical tunas through closures. Safe handling and release protocols for blue shark and billfish are consistently reviewed and updated appropriately and Recommendation [18-04] stipulates that CPCs shall work to minimize the post-release mortality of marlins/spearfish. As there is not a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species within ICCAT, SG 100 is not met.
References
Purwaningsih et al. 2011, FishSource 2022; MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	No. and So. Atlantic UoAs: 60-79
Information gap indicator	Additional evidence that shark finning is not occurring (e.g., port sampling records). Any information regarding stock origin for Indian oil sardine or Bali sardinella.

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

North and South Atlantic Ocean scores for each scoring element in PI 2.2.2

Scoring Element	SI a	SI b	SI c	SI d	SI e	Score	Overall PI Score
Indian oil sardine	≥80	≥80	≥80	n/a	≥80	≥80	60-79
Bali sardinella	≥80	≥80	≥80	n/a	≥80	≥80	
Secondary Minor	>80	Default 80	Default 80	60-79	Default 80	60-79	

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?	No. and So. Atlantic UoAs: Main secondary species: Yes	No. and So. Atlantic UoAs: Main secondary species: Yes	No. and So. Atlantic UoAs: Main Secondary species: No
Rationale				
Indian oil sardine & Bali sardinella The volume of bait used annually by the UoAs is known and for Indian oil sardine and Bali sardinella it is 0.3% and 0.4% of landings in India and Philippines, the presumed source origin fishery, respectively. Thus, for all three species of bait quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status; SG 60 and SG 80 is met. Since the specific origin area of bait species used in the fishery is not known at this time, adequate information is not available to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status, SG 100 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				
Catches of secondary minor species in the two UoAs are reported in logbooks and observer records that spans the period 2016 to 2020. Given the low observer coverage rates in both UoAs the assessment team did not consider these data to be representative of actual catches. Instead, the assessment team considers reported catches in the logbook data to be more representative of catches in the UoAs. The result suggests there is very				

little secondary species bycatch. The low rates demonstrated in the number of reported minor secondary species shows that information is adequate to estimate the minimal impact of UoAs on these species, SG100 is met.				
c	Information adequacy for management strategy			
	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?	**No. and So. Atlantic UoAs:** Indian oil sardine: Yes Bali sardinella: Yes	**No. and So. Atlantic UoAs:** Indian oil sardine: Yes Bali sardinella: Yes	**No. and So. Atlantic UoAs:** Indian oil sardine: No Bali sardinella: No All secondary minor species: No
Rationale				
Observer data and logbook information is available for 5 years from 2016 to 2020 for the UoAs which supports the partial strategy to manage main secondary species. Secondary sources of information is available for bait species including fishery-independent data (biological sampling) and fishery-dependent data (relative abundance series and catch sampling), which support current management measures/partial strategy listed in PI2.2.2. SG60 and SG80 is met. Given the low observer coverage of both UoAs and no information on the exact source origin for bait used by the UoAs, information is presently not adequate to support a strategy to manage all main secondary species and evaluate with a high degree of certainty whether the strategy is achieving its objective. SG 100 is not met. **Secondary Minor Species** Observer reports provide information to evaluate with a high degree of certainty whether a strategy to minimize bycatch of secondary minor species is effective. Unfortunately, observer coverage in both UoAs is low and the ability to use observer records as a basis to evaluate the utility of a strategy to minimize bycatch is not adequate. SG 100 is not met.				
References				
None				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	No. and So. Atlantic UoAs: Main secondary species >80 Minor secondary species: >80
Information gap indicator	Coverage rate of logbooks for the North and South Atlantic UoAs. Source origin for bait species.
Overall Performance Indicator scores added from Client and Peer Review Draft Report	

Overall Performance Indicator score	
Condition number (if relevant)	

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?	Not relevant	Not relevant	Not relevant
Rationale				
There are no national and/or international requirement that set limits for the ETP species that interact with the UoA. This SI is therefore considered to be not relevant.				
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?	**No. Atlantic UoA:** Oceanic whitetip: Yes Bigeye thresher: Yes No. Atl shortfin mako: Yes Marine mammal: Yes **So. Atlantic UoA:** Silky shark: Yes Oceanic whitetip: Yes Bigeye thresher: Yes Hammerhead: Yes Loggerhead turtle: Yes Leatherback turtle: Yes Olive ridley turtle: Yes Seabirds: Yes Marine mammal: Yes	**No. Atlantic UoA:** Oceanic whitetip: Yes Bigeye thresher: Yes No. Atl shortfin mako: Yes Marine mammal: Yes **So. Atlantic UoA:** Silky shark: Yes Oceanic whitetip: Yes Bigeye thresher: Yes Hammerhead: Yes Loggerhead turtle: Yes Leatherback turtle: Yes Olive ridley turtle: Yes Seabirds: Yes Marine mammal: Yes	**No. Atlantic UoA:** Oceanic whitetip: No Bigeye thresher: No No. Atl shortfin mako: No Marine mammal: No **So. Atlantic UoA:** Silky shark: No Oceanic whitetip: No Bigeye thresher: No Hammerhead: No Loggerhead turtle: No Leatherback turtle: No Olive ridley turtle: No Seabirds: No Marine mammal: No
Rationale				

The ETP species considered here are listed in Table 22 for the South Atlantic UoA and Table 23 for the South Atlantic UoA and both the species composition and number of interactions are based on a combination of logbook and observer data sets. There were limited ETP interactions reported in the North Atlantic (both logbook and observer data) but more in the South Atlantic. The main species groups were seabirds (not reported at the species level in logbooks), bigeye thresher sharks, sea turtles, and two marine mammal interactions (one North and one South Atlantic). Annual estimates of ETP interactions are also shown in (Table 22, Table 23) and are derived solely from observer data to provide a very coarse estimate of potential interactions.

The number of interactions were extrapolated from observer data to estimate annual encounters. Estimates were calculated by multiplying the number of sets recorded in logbooks from 2016-2020 (South Atlantic = 16,577, North Atlantic = 8,992) by the interaction rate recorded by observers (sets observed included South Atlantic = 1,203, North Atlantic = 146). Given that UoC logbook data covers only 66% of the fleet, effort was upscaled by 33% to account for vessels in which no catch information was available. Given the coarse method for calculating total ETP interactions, and the rare encounters and low observer coverage, the assessment team urges caution in interpretation of these estimates. Regardless, they are useful in providing an estimate to judge the annual range of interactions.

In the South Atlantic, there were interactions with four shark species (oceanic whitetip, silky shark, bigeye thresher and a hammerhead species), two sea turtle species (loggerhead and leatherback, and unknown species), seven seabird species, and a single dolphin interaction reported in the logbook data. Since no species identification for the dolphin was not provided, it is not considered further. Of the 11 oceanic whitetip sharks caught, 5 were retained and 6 discarded. All reported turtles interacting with fishing operations were released, as were all seabirds and sharks.

Oceanic Whitetip Shark

While there is no stock assessment of oceanic whitetip shark in the Atlantic Ocean, the species is protected as stipulated in ICCAT Recommendations 10-07. ICCAT Recommendation 10-07 states that "Contracting Parties, and Cooperating non-Contracting Parties, Entities or Fishing Entities (hereafter referred to as CPCs) shall prohibit retaining onboard, transhipping, landing, storing, selling, or offering for sale any part or whole carcass of oceanic whitetip sharks in any fishery." Based on logbook data a total of 11 oceanic whitetip shark were reported caught by the Taiwan UoA from 2016 to 2020, of which 6 animals were retained. Fate data was not provided for the discarded animals, but post release survival has been estimated to range from 68%-92% depending on the condition of the animal prior to release (Hutchinson and Bigelow 2019). While the catch rate of oceanic whitetip shark by the UoA of 32 per year, is considered low, the application of the worst-case survival scenario results in thirty sharks dying annually. As survival is likely higher than 68%, the number of sharks dying annually is likely less. On this basis the direct effects of the UoA are known and it is highly likely not to hinder recovery of oceanic whitetip shark in the North and South Atlantic UoAs; SG 60 and SG 80 are met. Given the rather low observer coverage in both UoAs the assessment team does not consider there to be a high degree of confidence that there are no significant detrimental direct effects of the North and South Atlantic UoAs on oceanic whitetip shark; SG100 is not met.

The retention of oceanic whitetip sharks contradicts protection afforded under Recommendation 10-07 and this issue will be addressed under PI 2.3.2d and in P3.

Silky Shark

While there is no stock assessment of silky shark in the Atlantic Ocean, this species is protected as stipulated in ICCAT Recommendation 11-08. ICCAT Rec. 11-08 states that "Contracting Parties, and Cooperating non-Contracting Parties, Entities or Fishing Entities (hereafter referred to as CPCs) shall require fishing vessels flying their flag and operating in ICCAT managed fisheries to release all silky sharks whether dead or alive, and prohibit retaining on board, transshipping, or landing any part or whole carcass of silky shark."

Logbook data recorded no interactions with silky sharks. However, observer data in the South Atlantic recorded 2 interactions, which could be extrapolated to 32 individuals per year. Although life status information was not provided for the discarded animals, post release survival has been estimated at approximately 95%-100% (Hutchinson and Bigelow, 2019). Given the low reported catch rate of silky sharks in the South Atlantic UoA and anticipated high post release survival, the direct effects of the UoA are known and it is highly likely not to hinder recovery of silky shark in the South Atlantic UoA; SG 60 and SG 80 are met. Given the rather low observer coverage in the South Atlantic UoA the assessment team does not consider there to be a high degree of confidence that there are no significant detrimental direct effects of the South Atlantic UoA on silky shark; SG100 is not met.

Bigeye thresher

The bigeye thresher shark is a circumglobally distributed species, commonly with an oceanic distribution. It is one of the less productive pelagic shark species, due to the very low fecundity (2 pups per cycle) and late maturity (12–13 years for females) (Sharks MOU, nd). It occurs mostly below 100 m depth but has been recorded to 955 m (Compagno 2001, Coelho et al. 2015). It is present near the surface at night and makes deep dives during the day (Clarke et al. 2015). The species is most commonly captured in longline, purse seine and gillnet fisheries. Genetic results indicate one global population, however there is some genetic structuring between the Northwest Atlantic and the Pacific Oceans (Rigby et al. 2019). It is listed as vulnerable by IUCN. In the Northwest Atlantic, data from the United States pelagic longline fishery for 1992–2013 indicated that the abundance had stabilized, while noting that fishing pressure had been present for two decades prior to 1992 and that the abundance had likely stabilized at lower abundance than unexploited biomass (Young et al. 2016). In the South Atlantic, CPUE data from a longline fleet indicated a generally decreasing trend from 1971 to 2001 (Mancini 2005), however because the data were not considered robust due to the low catch rates (R. Barreto unpubl. data), they were not analysed over three generations.

In 2009, ICCAT banned retention, transshipment, landing, storage, and sale of Bigeye Threshers, with a small exception for Mexico. This management action was based on a 2008 Ecological Risk Assessment that ranked the Bigeye Thresher as the most vulnerable of 16 Atlantic elasmobranch species in terms of overfishing from longlines. Shark finning is prohibited in the ICCAT (Recommendation 04-10) and under Taiwan legislation (Regulations for Tuna Longline or Purse Seine Fishing Vessels Proceeding to the Pacific Ocean for Fishing Operation). Bigeye thresher sharks were shown to have relatively high post-release survival at 82% (Hutchinson et al. 2021).

Based on extrapolated observer data from the North and South Atlantic, 49 and 44 individuals are estimated to be captured each year, with 9 and 8 mortalities estimated per annum. Based on the catch volume of the species and anticipated high post release survival, the direct effects of the UoA are known and it is highly likely not to hinder recovery of bigeye thresher in the South Atlantic and North Atlantic UoAs; SG 60 and SG 80 are met. Given the rather low observer coverage in both UoAs the assessment team does not consider there to be a high degree of confidence that there are no significant detrimental direct effects of the bigeye thresher shark; SG100 is not met.

Shortfin Mako (North Atlantic)

The Northern shortfin mako shark is protected under ICCAT as of 2021 and vessels are required to release any individuals captured. The same protection does not extend to the Southern stock. The shortfin mako is a coastal, oceanic species occurring from the surface to at least 500 m depth and is widespread in temperate and tropical waters of all oceans from about 50°N (up to 60°N in the northeast Atlantic) to 50°S. The latest assessment of the status of North and South Atlantic stocks of shortfin mako shark was conducted in 2017 with updated time series of relative abundance and annual catches, life history metrics, and with the inclusion of length composition data (ICCAT 2017). For the North Atlantic stock, results of nine stock assessment model runs were selected to provide stock status and management advice. Although all results indicated that stock abundance in 2015 was below B_{MSY}, results of the production models (BSP2JAGS and JABBA) were more pessimistic (B/B_{MSY} deterministic estimates ranged from 0.57 to 0.85) and those of the age-structured model (SS3), which indicated that stock abundance was near MSY (SSF/SSF_{MSY} = 0.95 where SSF is spawning stock fecundity), were less pessimistic. The ratio B_{2015}/B_0 was estimated at to range from 0.34-0.57. Current F was estimated to be well above FMSY (F_{2015}/F_{MSY} = 1.93-4.38), with a combined 90% probability from all the models of being in an overfished state and experiencing overfishing ().

Projections indicated that current catch levels (3,600 t and an alternative, 4,750t, based on catch ratios) in the North Atlantic will cause continued population decline. Catches would need to be reduced to 1,000 t or lower to prevent further population declines. The Kobe II strategy matrices showed that for a constant annual catch of 1,000 t, the probability of being in the Kobe plot green zone would only be 25% by 2040. It was noted that the future outlook is probably more pessimistic because the fisheries are removing mostly juveniles and thus it can be anticipated that spawning stock will keep declining for years after fishing pressure has been reduced.

It is estimated the fishery catches 164 shortfin makos in the North Atlantic per year based on observer data. When compared to the estimated population of the species, and that retention is now prohibited for the species, it is highly likely that the fleet would not hinder recovery of the ETP species, reaching SG60 and 80. Given the rather low observer coverage in both UoAs the assessment team does not consider there to be a high degree of confidence that there are no significant detrimental direct effects of the shortfin mako shark; SG100 is not met.

Hammerhead spp

Logbook data reported the capture of hammerhead sharks in the South Atlantic, though no species was identified. Information on the great and scalloped hammerhead is presented here. Great hammerhead (*Sphyrna mokarran*) and scalloped hammerhead (*Sphyrna lewini*) sharks are long lived, late maturing, and relatively slow growing. Most information available on the status and trends consists of fisheries catch data for these species. However, catch data are often aggregated due to species identification issues. The current IUCN status for both species is Endangered globally (Baum et al. 2009, Denham et al. 2007). A summary of the stock statuses shows declines throughout the ranges. These species experience very high at vessel mortality. Regardless, the low levels of reported interactions with hammerheads (and that no interactions were observed in either UoA), it is highly likely that the fleet would not hinder recovery of the ETP species, reaching SG60 and 80. Given the rather low observer coverage in both UoAs the assessment team does not consider there to be a high degree of confidence that there are no significant detrimental direct effects on great or scalloped hammerhead species; SG100 is not met.

Sea Turtles

While there does not appear to be an assessment of loggerhead turtles in the Atlantic Ocean, the species is listed as endangered in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Additional protection is afforded through ICCAT Recommendations 03-11, 10-09 and 13-11 aimed at mitigating interactions and mortality, and implementing reporting requirements. Based on logbook and observer data from vessels operating in the South Atlantic UoA, 7 loggerhead turtles were caught, and all turtles were released. There were 5 sea turtles captured but no species identification made. Logbook data reported capture of 34 sea turtles but no species identification was included. Historical ICCAT observer information accessed through their online Meta By-Catch Database reported interactions with leatherback, loggerhead, and olive ridley turtles from 2000-2013. Based on the historical observer information the 5 interactions with unidentified marine turtles were allocated to these 3 turtle species as 2 loggerhead turtle interactions, 2 olive ridley turtle interactions, and 1 leatherback turtle interactions between from observer data. Past studies on the incidental catch of sea turtles on the Taiwan longline vessels operating in the Atlantic Ocean from 2004 to 2011 (Huang 2013) estimated an interaction rate of 8 loggerhead turtles annually. This is significantly lower than would be suggested by observer data records here. From observer records, we would estimate interaction rates of 26 loggerheads per year, with 7 potentially dying when post-capture mortality is factored in. An estimated 11 leatherbacks are captured annually, with 3 mortalities per year and 4 olive ridley turtles and 1 mortality per year. Recalling that ICCAT Rec. 13-11 requires all fisheries to follow safe handling practices specified in the Recommendation which are consistent with FAO's Guidelines to Reduce Sea Turtle

Mortality in Fishing Operations, and noting that longline vessels operating in the ICCAT Convention area are required to carry on board de-hooking devices to effectively remove hooks from sea turtles and line-cutters to use when de-hooking is not possible, there is a high probability that the estimated post release mortality (28%) has been reduced further assuming the safe handling practices and provided equipment are used effectively.

Based on this information, direct effects of the UoA can be assumed known and are likely to not hinder recovery of this ETP species; SG 60 is met. As the majority of turtles interacting with the South Atlantic UoA were not identified, we employed a precautionary approach to allocate contemporary interactions to turtle species known to inhabit the region. Even so, an annual potential UoA mortality of 7 loggerhead turtle per year, 3 leatherback turtles per year and 1 olive ridley, it is considered highly likely not to hinder the recovery of any marine turtle species and SG80 is met.

Given the rather low observer coverage in the South Atlantic UoA the assessment team does not consider there to be a high degree of confidence that there are no significant detrimental direct effects of the South Atlantic UoA on marine turtles; SG100 is not met.

Seabirds

No seabirds were recorded as captured in logbook or observer data in the North Atlantic. There were 7 species identified by observers in the South Atlantic, and 45 birds recorded as captured between 2016-2020 in logbook data with no determination of species. Annual estimates based on extrapolated observer records are provided in Table 22. Estimates range from a high of 40 for the Atlantic yellow-nosed albatross and a low of 4 for the sooty albatross and white-chinned petrel.

The yellow-nosed albatross is listed as endangered in Appendix I of the Agreement on the Conservation of Albatrosses and Petrels (ACAP). The species has a very small breeding range in the South Atlantic Ocean and is estimated to be undergoing a decline projected over three generations (72 years) owing potentially to incidental mortality in longline fisheries (http://datazone.birdlife.org/species/factsheet/atlantic-yellow-nosed-albatross-thalassarche-chlororhynchos). Current population size is estimated to range between 35,000 and 73,500 animals. Given that 11 yellow-nosed albatross interactions were observed in 1,203 sets and an estimated 22,097 sets were deployed in the South Atlantic UoA between 2016 and 2020 the total number of interactions was estimated to be 202 for the 5-year observer period or approximately 40 animals annually. Taking a precautionary approach and assuming a population size of 35,000 animals and that all interactions result in death, the direct effects of the UoA are known as is the impact to the population; the UoA removes approximately 0.1% of the population. The assessment team considers the impact to the population to be minimal and that the UoA is likely to not hinder recovery of this ETP species. On this basis SG 60 and SG 80 are met. Based on available information the assessment team does not have a high degree of confidence that there are no significant detrimental direct effects of the UoA on this ETP species; SG 100 is not met.

Based on observer information, three greater shearwaters were caught by the South Atlantic UoA and all birds were discarded. Greater Shearwaters are not globally threatened. They are abundant with enormous total populations of a minimum five million breeding pairs on Tristan da Cunha, 600,000 to three million pairs on Gough Island, and small numbers on Falkland Islands (https://animaldiversity.org/accounts/Puffinus_gravis/). Their breeding range is restricted with only 4 sites known. Following the same analytical approach to estimate total annual interactions and assuming a precautionary approach with all interactions resulting in death a total of eleven shearwaters are killed annually by the South Atlantic UoA. Assuming a total population size of 300,000 animals the UoAs impact would be negligible.

For the remaining seabird species, the population status, annual estimated catch rates, and likelihood of impacts can be summarized as:

- Wandering albatross - The wandering albatross is considered vulnerable by the IUCN. Overall past and predicted future declines amount to a rapid population reduction over a period of three generations, qualifying the species as Vulnerable. At South Georgia, this species is undergoing a rapid decline over three generations (70 years). Longline fishing s likely to be the main cause of decline in this species, causing reductions in adult survival and juvenile recruitment, and this threat is on-going. There are an estimated 20,100 mature individuals globally. It is estimated that the UoA captures 15 individuals a year. Based on the catches of the fishery and population estimates, the assessment team considers the impact to the population to be minimal and that the UoA is likely to not hinder recovery of this ETP species.

- Sooty albatross - The total annual breeding population is estimated at 10,617 - 14,328 pairs (ACAP 2012), including c.2.500-5,000 pairs on Gough Island, 3,157 pairs in the Tristan da Cunha group (to the U.K.), c. 1,450 pairs on Prince Edward and c. 1,700 pairs on Marion Island (South Africa), 2,080- 2,200 pairs on the Crozet Islands, and 470 pairs on Amsterdam Island (French Southern Territories). It is estimated that the UoA captures 4 individuals a year. Based on the catches of the fishery and population estimates, the assessment team considers the impact to the population to be minimal and that the UoA is likely to not hinder recovery of this ETP species.
- White-chinned petrel - The white-chinned petrel is considered vulnerable by the IUCN. Recently revised global population of 1,200,000 breeding pairs, down from 1,430,000 pairs in the 1980s, is estimated based on figures from 1985-2011. This equates to an estimated global population of c.3 million mature individuals, based on the estimated number of breeding pairs extrapolated according to a ratio from Brooke (2004). It is estimated that the UoA captures 4 individuals a year. Based on the catches of the fishery and population estimates, the assessment team considers the impact to the population to be minimal and that the UoA is likely to not hinder recovery of this ETP species.
- Spectacled petrel - The species has experienced historic declines throughout its range though recent population estimates suggest an increasing trend. It is considered Vulnerable by the IUCN. An extrapolation from snapshot censuses conducted in waters off Brazil in 1997-1999 suggested a total population of 38,000 ± 7,000 (BirdLife 2018b). This population increase over time is thought to have been initiated by the eradication of pigs from Inaccessible Island. Between 1999-2004, the species may have increased by up to 45% (BirdLife 2018b), but the toll taken by bycatch in longline fisheries is poorly understood. It is estimated that the UoA captures 30 individuals a year. Based on the catches of the fishery and population estimates, the assessment team considers the impact to the population to be minimal and that the UoA is likely to not hinder recovery of this ETP species.
- Black-browed Albatross - The black-browed albatross is considered Least Concern by IUCN. This species has an extremely large range, the population size is extremely large and appears to be increasing. The global population estimate is c.700,000 pairs, which equates to 1,400,000 mature individuals. It is estimated that the UoA captures 40 individuals a year. Based on the catches of the fishery and population estimates, the assessment team considers the impact to the population to be minimal and that the UoA is likely to not hinder recovery of this ETP species.

Based on the information provided and precautionary estimates of total mortality, direct effects of both UoAs are highly likely to not hinder recovery of all seabird ETP species. SG 60 and SG 80 are met. Due to limitations on data the assessment team could not state with certainty there is a high degree of confidence that there are no significant detrimental direct effects of UoAs on this ETP species. SG 100 is not met.

Marine mammals

Only a single marine mammal was registered as taken (this aligned both with logbook and observer data). This species was the common bottlenose dolphin. It is considered Least Concern by the IUCN and capture in longline fisheries is not considered a major threat to this species population status (Wells et al. 2019). The annual catch estimates from the fleet are 4 individuals, which even if complete mortality were assumed, would be highly unlikely to hinder recovery of the species, and SG60 and SG80 is met. Due to limitations on data the assessment

<table>
<tr><td colspan="5">team could not state with certainty there is a high degree of confidence that there are no significant detrimental direct effects of UoAs on this ETP species. SG 100 is not met.</td></tr>
<tr><td rowspan="3">C</td><td colspan="4">Indirect effects</td></tr>
<tr><td>Guide post</td><td></td><td>Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.</td><td>There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.</td></tr>
<tr><td>Met?</td><td></td><td>No. and So. Atlantic UoAs
All ETP species: Yes</td><td>No. and So. Atlantic UoAs
All ETP species: No</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">North and South Atlantic UoAs

Potential indirect impacts on ETP species could result if they become accidentally entangled in the gear, or by biting/ingesting lost gear. Given that longline gear represents a significant monetary investment and most vessels carry only a single longline spool, GPS beacons are used to track longline gear thus minimizing the chances of gear being lost. When a loss does occur, the lines quickly sink to the bottom of the sea instead of remaining available to ETP and other pelagic species, and once the bait falls off it does not impact the bottom species. Based on the characteristics of the gear and fishing operations, the assessment team considers that indirect effects caused by the UoA are thought to be highly likely to not create unacceptable impacts; SG 80 is met.

As information from monitoring and/or research on this issue is not available, there is not a high degree of confidence that no significant detrimental indirect effects of the UoA on ETP species is occurring. Therefore, SG100 is not met.</td></tr>
<tr><td colspan="5">References</td></tr>
<tr><td colspan="5">Hutchinson and Bigelow 2019, Swimmer et al. 2013, Huang 2013, Curtis et al. 2014, BirdLife International 2018a, b, c, d, e, Wells et al. 2019, BirdLife International 2021

https://animaldiversity.org/accounts/Puffinus_gravis/; http://datazone.birdlife.org/species/factsheet/atlantic-yellow-nosed-albatross-thalassarche-chlororhynchos;</td></tr>
<tr><td colspan="5">Draft scoring range and information gap indicator added at Announcement Comment Draft Report</td></tr>
<tr><td colspan="3">Draft scoring range</td><td colspan="2">No. Atlantic UoA: ≥ 80
So. Atlantic UoA: ≥ 80</td></tr>
<tr><td colspan="3">Information gap indicator</td><td colspan="2">Information on ETP catch in the South Atlantic UoA.
Information on the frequency of longline gear being lost.
Life status of animals post release.
Low observer coverage.</td></tr>
<tr><td colspan="5">Overall Performance Indicator scores added from Client and Peer Review Draft Report</td></tr>
<tr><td colspan="3">Overall Performance Indicator score</td><td colspan="2"></td></tr>
</table>

Condition number (if relevant)	

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				
There are no national and/or international requirement that set limits for the ETP species that interact with the UoA. This SI is therefore considered to be not relevant.				
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?	**No. and So. Atlantic UoAs:** All ETP species: Yes	**No. and So. Atlantic UoAs:** All ETP species: Yes	**No. and So. Atlantic UoAs:** All ETP species: No
Rationale				
North and South Atlantic UoAs According to the ACAP the combined use of some of these measures (weighted branch lines, bird scaring lines [tori lines], and night setting) represents best practice to mitigate seabird bycatch in pelagic longline fisheries. The three mitigation measures are a requirement listed in ICCAT Recommendation 11-09 and longline vessels fishing south of 25° South latitude must use at least two of the mitigation measures. UoA vessels fishing in the South Atlantic use weighted main lines and tori lines. When present, observers record their use, and for unobserved vessels port inspectors verify that the gear is onboard the vessel. Additionally, Bird Life International has implemented training programs in Taiwan to educate fishers and managers on effective mitigation measures to reduce seabird interactions and implement safe handling practices.				

ICCAT has adopted several recommendations for sharks, either in a general or species-specific manner, in accordance with an ecosystem approach. Recommendation by ICCAT on Compliance with Existing Measures on Shark Conservation and Management (Rec. 12-05) and Recommendation by ICCAT on Improvement of Compliance Review of Conservation and Management Measures regarding Sharks Caught in Association with ICCAT Fisheries (Rec. 16-13), requires CPCs to report on their implementation of and compliance with the shark conservation and management measures. Recommendation 18-06 requires CPCs to submit to the ICCAT Secretariat, with their Annual Reports, details of their implementation of and compliance with all shark conservation and management measures. ICCAT Recommendation 10-07 prohibits retaining onboard, transhipping, landing, storing, selling, or offering for sale any part or whole carcass of oceanic whitetip sharks in any fishery, and requires observers to record the number of discards and releases of oceanic whitetip sharks with indication of status (dead or alive) and report this information to ICCAT. Similarly, Recommendation 11-08 prohibits the retention of silky sharks by CPCs.

Recommendation 10-09 and 13-11 (which replaced Rec. 10-09) specify reporting requirements for vessels that encounter sea turtles (including entanglements with FADs), requires safe handling and release procedures consistent with FAO's Guidelines to Reduce Sea Turtle Mortality in Fishing Operations, and specifies required equipment to be carried on vessels. Additionally, Resolution 03-11 encourages "technical measures to reduce the incidental catch of turtles" and resolves to "support efforts by FAO to address the conservation and management of sea turtles, through a holistic approach". Resolution 05-08 encourages all CPCs to undertake research trials of appropriate-size circle hooks in commercial pelagic longline fisheries.

Noting there are binding international agreements aimed at protecting ETP species that apply to the UoAs seeking MSC certification in the ICCAT Convention area, neither the flag state of the UoA, nor the state in which fishing takes place, need be a signatory to these agreements for it to be applicable to MSC certified UoAs. Several Agreements have been developed under the aegis of the Convention of Migratory Species (CMS). The CMS is an intergovernmental treaty under which legally binding global or regional Agreements can be developed. Parties to the CMS are required to "endeavour to provide immediate protection for migratory species included in Appendix I of the CMS" and to "endeavour to conclude Agreements covering the conservation and management of migratory species included in Appendix II". Several of the shark species, as well as seabirds and marine turtles caught by UoA vessels are listed in Appendix I of CMS or other binding agreements concluded under the CMS (Annex 1 of the Agreement on the Conservation of Albatrosses and Petrels (ACAP)).

The ICCAT Sub-Committee on Ecosystems integrates the monitoring and research activities related to the ecosystem that are required by the SCRS in fulfilling its advisory role to the Commission, including the following tasks related to incidentally caught non-target species:

- Monitor and improve information on interactions with non-ICCAT target species, with emphasis on those species of interest to the Commission and for which no Species Group has been established
- Characterize the volume, composition and disposition of non-target species that are caught incidentally in tuna and tuna-like fisheries within the Convention area
- Investigate the impact that changes in fishing gears or fishing technology have on the catch of target and non-target species
- Investigate, through operational models, potential benefits (at an ecosystem level) of alternative management strategies, such as time-area closures.

Lastly, the UoA vessels are required to submit logbooks of fishing activities, collect VMS information, and carry observers, albeit at a minimum 5% coverage rate. Taiwan UoA vessels are prohibited from finning based on National Laws.

Thus, there is a strategy in place for managing the UoA's impact on ETP species proposed by ICCAT and Taiwan authorities, including measures to minimise mortality designed by ICCAT and implemented by Taiwan

authorities, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species. On this basis, SG80 is met. For there to be a comprehensive strategy in place, its attributes, including monitoring, analyses and management responses should be integrated and tested for efficacy. The assessment team considers that more effort on testing alternatives is needed, also there is a need for standardized responses if measures in place are identified as inefficient. Therefore, 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?	**No. and So. Atlantic UoA:** All ETP species: Yes	**No. and So. Atlantic UoA:** All ETP species: Yes	**No. and So. Atlantic UoA:** All ETP species: No
Rationale				
Conservation measures aimed at reducing ETP interactions with fisheries and ensuring their survival upon release have been adopted internationally by all tuna RFMOs. Reducing the removal of animals from populations generally benefits the population and is the rationale behind many of the conservation measures. These measures are considered likely to work based on theory, as well as past experience; requirements for the SG60 level are met for both the North Atlantic and South Atlantic UoAs. Measures within ICCAT have been established and applied directly to the UoA, including non-retention policies, mandatory logbooks, observer coverage (albeit only 5%), skipper training and workshops, detailed release procedures, requirements for the carriage and use of specific equipment to aid release of ETP species, and formal reporting requirement. These activities and measures outlined in SIb and applied to the North and South Atlantic UoAs constitute a collection of measures/strategy and provide an objective basis that the strategy will work based on information directly about the fishery/species involved, thus meeting requirements at the SG80 level. However, there has been no quantitative analysis of the strategies to support high confidence that they will work, SG 100 is not met.				
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?		**North Atlantic UoA** Oceanic whitetip shark: No All ETP Species: Yes **So. Atlantic UoA** Oceanic whitetip shark: No	**No. And So. Atlantic UoA** All ETP species: No

			All other ETP species: Yes	
Rationale				

South Atlantic UoA

Some evidence that elements of the strategy are being implemented successfully do exist, including the collection and submission of observer records and logbooks, as well as the adoption of best practices by the UoA, this is not the case for all ETP species. Five oceanic whitetip sharks were retained in the South Atlantic UoA despite retention being prohibited under Recommendation 10-07. On this basis oceanic whitetip shark does not meet SG 80. For all other ETP in the South Atlantic UoA there is some evidence that measures as outlined in SI-b are being implemented successfully; SG 80 is met. However, there is room for additional improvement before it can be said there is clear evidence that the strategy is being implemented successful. Thus, SG 100 is not met.

North Atlantic UoA

Some evidence that elements of the strategy are being implemented successfully do exist for the North Atlantic UoA, including the collection and submission of observer records and logbooks. For all other species there has been no non-compliance with adopted measures and this constitutes some evidence that strategies are being implemented successfully, SG 80 is met. As there is still room for additional improvement before it can be said there is clear evidence that the strategy is being implemented successfully, SG 100 is not met.

For oceanic whitetip shark it cannot be stated that there is some evidence that the strategy is being implemented successfully. There appears to be a propensity to retain oceanic whitetip shark by the UoA as noted in the South Atlantic and there is no reason to conclude that it is not occurring in the North Atlantic, therefore SG 80 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?	**No. and So. Atlantic UoAs** All ETP species: Yes	**No. and So. Atlantic UoAs** All ETP species: Yes	**No. and So. Atlantic UoAs** All ETP species: No
Rationale				

North and South Atlantic UoAs

The ICCAT Sub-Committee on Ecosystems integrates the monitoring and research activities related to the ecosystem that are required by the SCRS in fulfilling its advisory role to the Commission, including investigating the impact that changes in fishing gears or fishing technology have on the catch of target and non-target species and, through operational models, exploring the potential benefits (at an ecosystem level) of alternative management strategies, such as time-area closures. The Committee meets regularly, and conclusions and recommendations are presented during annual meeting of the ICCAT Commission for further discussion and consideration. 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. Thus, requirements

for SG 60 and SG 80 are met for both UoAs. As there is no biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species SG 100 is not met.	
References	
None	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	**No. Atlantic UoA:** Oceanic whitetip: 60-79 Bigeye thresher: ≥80 No. Atl shortfin mako: ≥80 Marine mammal: ≥80 **So. Atlantic UoA:** Silky shark: ≥80 Oceanic whitetip: 60-79 Bigeye thresher: ≥80 Hammerhead: ≥80 Loggerhead turtle: ≥80 Leatherback turtle: ≥80 Olive ridley turtle: ≥80 Seabirds: ≥80 Marine mammal: ≥80
Information gap indicator	Rationale for the retention of oceanic whitetips. The coverage rate of submitted logbook data (e.g., 70%, 80%, etc. of fishing activity).
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

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?	**No. and So Atlantic UoAs** All ETP species: Yes	**No. and So Atlantic UoAs** All ETP species: No	**No. and So Atlantic UoAs** All ETP species: Not scored
Rationale			

The information collected on ETP species from logbooks and by the observer program is adequate to estimate the UoA related mortality for all ETP species. By testing various assumptions about the fate of ETP species (e.g., all dead, all alive, etc.) risk profiles can be developed. For some of the ETP species post release mortality estimates are available and can be applied, while in cases where information is lacking a mortality profile can be applied to assess risk. On this basis, qualitative information is considered adequate to estimate the UoA related mortality on ETP species and the requirements at the SG60 level are met.

SG80 requires population-level as well as fishery-level information, and due to a lack of sufficient information for both sources quantifying UoA related mortality analytically relevant to stock status is not possible for sharks, cetaceans, marine turtles, and seabirds. For many of the ETP species interacting with vessels from the North and South Atlantic UoAs, population-level estimates of abundance are not available. Also, for many of the interactions the animal was either not identified or mis-identified. Information is not adequate to assess the UoA related mortality and impact, and to determine whether the UoA may be a threat to protection and recovery of these ETP species. There is no adequate quantitative information to assess the impact of the UoA related mortality and on this basis SG 80 is not met.

SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).

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?	**No. and So. Atlantic UoA** All ETP species: Yes	**No. and So. Atlantic UoA** All ETP species: No	**No. and So. Atlantic UoA** All ETP species: Not scored

Rationale

Catch data from both logbooks and observer programs are provided annually to the ICCAT as mandated by ICCAT Recommendations. Both data sets routinely indicate the fate of the catch (retained or discarded), and for ETP species their status when released (dead or alive) is indicated for most animals. When status information was not provided, the assessment team took a precautionary approach when assessing impacts and assumed 100% mortality for all released animals. It is considered that information is adequate to support one or more measures, an understanding of how they work to achieve an outcome, and which are designed to manage impacts on the UoA related mortality of ETP species. On this basis SG60 is met.

ICCAT Recommendation 16-14 specifies minimum standards for observer programs and requires at least 5% observer coverage of longline fishing effort. CPCs are also required to report observer coverage rates to the ICCAT annually. In 2017, Taiwan reported an observer coverage rate of 7.27% for vessels targeting albacore tuna in the ICCAT Convention area. While this meets the requirement specified in Rec. 16-14, observer coverage rates of UoA vessels is somewhat lower and at lower coverage rates the ability of collected data to accurately reflect ETP interactions on unsampled segments of a fleet can be problematic. While the estimates of UoA related mortality are sufficiently precise and quantitative to manage impacts on ETP species, the data may not be adequate to measure trends.

Furthermore, based on the analysis of historical observer/logbook data assembled by the assessment team via the ICCAT By-catch Meta-Database from 2000-2013, approximately 197 seabird interactions occurred in the South Atlantic Ocean. While the observed reductions in seabird interactions through time (197 historically vs 5 recently) in the South Atlantic may result from the adoption of stricter conservation measures, all other factors being equal, the lack of species specificity in the historical observer data hampers the assessment's team ability to make direct comparisons over time with the contemporary observer and logbook data provided. As a result, seabird information is not adequate to measure trends and support a strategy to manage impacts on ETP species. On this basis and the rationale above, SG 80 is not met.

SG100 is not scored as not all SG80 requirements are met (see MSC interpretation https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218).

References

None

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	No. and So. Atlantic UoA All ETP species: 60-79
Information gap indicator	Logbook and observer program protocols and reporting requirements at both the UoA level and management bodies (TFA and ICCAT).
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

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 be serious or irreversible harm.	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.	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.
	Met?	Both UoAs - Yes	Both UoAs - Yes	Both UoAs - Yes
Rationale				
As the pelagic longline fishery sets gear in the upper portions of the water column, there is no possibility for the gear to contact demersal habitats. Gear in the UoA is set around 45 m to 58 m depth from the ocean surface away from the continental shelf. As a result, there is no contact with the benthic habitat and therefore impacts are considered minimal. The UoA only operate in the high seas and therefore do not operate in shallow waters and this can be confirmed by logbooks and VMS records. Recent reports of analogous long fisheries confirm that these fisheries do not negatively impact benthic substrates (Monterey Bay Aquarium 2021). The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. SG60 is met. 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. SG80 is met. 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. SG100 is 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?	Both UoAs - Yes	Both UoAs - Yes	Both UoAs - Yes
Rationale				
As noted in the background, the fishery does not interact directly with any VMEs given sets are deployed in the epipelagic zone. The pelagic habitat does not have any of the characteristics of VMEs outlined in GSA3.13.3.2. Multiple studies summarized in a recent Seafood Watch Report indicate that pelagic longline gear result in no				

negatively impact bottom habitat (Monterey Bay Aquarium 2021). As a result, 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. This meets the requirements of the SG 60, SG 80, and SG100 levels.				
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?			Both UoAs - Yes
Rationale				
As noted above in Si a, there is no possibility that the UoA would cause any harm on demersal or pelagic habitats and on this basis SG 100 would be met. As permitted through the MSC interpretation log, the assessment team has verified this evidence through review of analogous fisheries (Monterey Bay Aquarium 2021). Therefore, 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 and SG 100 level is met.				
References				
Monterey Bay Aquarium 2021				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.2 – Habitats management strategy

<table>
<tr><td colspan="2">PI 2.4.2</td><td colspan="3">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</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Management strategy in place</td></tr>
<tr><td>Guide post</td><td>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</td><td>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</td><td>There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.</td></tr>
<tr><td>Met?</td><td>Yes</td><td>Yes</td><td>Yes</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">Pelagic longlines do not interact with any seafloor habitat and do not harm the pelagic habitat. A fully rigged longline (floats, float-line, branch-lines, and hooks) is very valuable, and loss of the longline generally means the end of fishing (fishing vessels generally carry only one longline spool). As a result fishers take extraordinary measure to retrieve all gear. Considering that this fishery is unlikely to impact benthic habitats, the term ‘if necessary’ applies here and management measures should not be required. SG 60 and SG80 are therefore met.

Table GSA8 from MSC Fisheries standard v2.01 provides guidance to determine if a strategy could be considered in place for pelagic longlines in relation to habitat impacts. It states: “The use of the gear, the understanding that comes from years of peer-reviewed research about its impacts, and the specific management strategy that mandates only its use could be construed as a cohesive and strategic arrangement. This is supported by demonstrable understanding about how the use of pelagic longlines work to avoid impacting benthic habitats specifically, and some understanding about the impacts of lost gear on habitat and the relative effects of such impacts are deemed to be low risk for overall habitat health. Periodic assessments (i.e., directed research and risk assessments) are undertaken to inform management decision makers about lost gear impacts to ensure that management strategies are working and are demonstrably avoiding serious or irreversible harm to “main” habitats and to determine whether changes need to be made to mitigate unacceptable impacts”.

The negligible impact of the fishery on the habitat was considered in previous MSC assessment and the fishery could be considered an operational strategy for managing the impact of the fishery on habitat types (Albacore Fishing Association South Pacific Albacore Troll/Jig Fishery, and American Albacore Fishing Association North Pacific Albacore Pole & Line and Troll/Jig Fishery). Moreover, stakeholders consulted stated that the fishery does not have any impacts on the habitat and therefore, a strategy itself did not need to be created.

Based on the totality of the information, there is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats. SG100 is met.</td></tr>
<tr><td rowspan="2">b</td><td colspan="4">Management strategy evaluation</td></tr>
<tr><td>Guide post</td><td>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).</td><td>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.</td><td>Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.</td></tr>
</table>

	Met?	Yes	Yes	No
Rationale				
Knowledge in relation to the way longline fishing gear is fished as well as the sea areas where the fleet operates (open ocean, deep waters) is sufficient to discount any significant impacts on seabed habitats from the fishery and because of the low catch rates for most secondary species it is not considered capable of affecting the epipelagic habitat. Monitoring of catches and fishing practices, as well as fishing locations provides high confidence on information from the fishery and the habitats encountered. Such data helps confirm that catches are only taken from surface waters and in offshore locations as expected for the UoA. As stated in Si-a above, management measures as described under SGs 60 and 80 are not required and these are automatically met. As there is no testing to support with high confidence that the partial strategy/strategy will work, SG100 is not 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	Yes
Rationale				
Knowledge in relation to the way longline fishing gear is fished as well as the sea areas where the fleet operates (open ocean, deep waters) is sufficient to discount any impacts on seabed habitats from the fishery. While this information was verified during stakeholder interviews it will be checked again with this fishery relevant stakeholders during the next site visit. Monitoring of catches and fishing practices, as well as fishing locations via mandatory logbook, VMS, and observer requirements provides clear quantitative evidence that the partial strategy/strategy is being implemented successfully and achieving objectives as outlined in Si-a; SG 80 and SG100 are 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?	Yes	Yes	Yes
Rationale				
In the absence of interactions with VMEs (see PI 2.4.1), this issue is met by default. SG100 is met.				
References				

None	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

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				
Following GPF7.1.5 "main" habitats includes habitats that are commonly encountered by the UoA or VMEs. Commonly encountered habitats: Fishing takes place in the epipelagic habitat and so longlines themselves do not interact with benthic habitat during its operation. The distribution of the pelagic habitat is known over the spatial range within which the fishery operates from widely available sea charts and bathymetric maps of the Atlantic Ocean. VMEs: As described above, derelict longlines potentially impact coral reefs. While the distribution of coral reefs throughout the Atlantic Ocean has generally been mapped, potential habitats impacted by derelict longlines is not well known. The types and distribution of the main habitats are broadly understood, SG 60 is met. 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, SG 80 is met. The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats, SG 100 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	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there	The physical impacts of the gear on all habitats have been quantified fully.

		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.	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 estimate the consequence and spatial attributes of the main habitats.	
	Met?	Yes	Yes	No
Rationale				
Information on the spatial extent and on the timing and location of use of the fishing gear is collected by VMS (100% coverage) and thus there is accurate, near real-time monitoring of the spatial extent of interaction, and the timing and location of use of the fishing gear. Logbook data is collected from the UoA allowing for the spatial assessment of main impacts on 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. This meets the requirements of the SG 60 and SG 80 levels. However, reliable data on the location of lost longlines that become beached is not available and this hinders a full understanding of the nature of the impacts of the gear on these habitats. It cannot be said the physical impacts of the gear on all habitats have been quantified fully. Thus requirements at the SG 100 level are not met.				
c	Monitoring			
	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	Yes
Rationale				
For the UoA, the habitat under consideration is the pelagic water column and no hard substrate is impacted by the fishery. The physical, chemical and biological properties of the Atlantic Ocean are regularly monitored. The client vessels all operate under a VMS scheme and thus there is accurate, near real-time monitoring of the spatial extent of interaction, and the timing and location of use of the fishing gear. Adequate information continues to be collected to detect any increase in risk to the main habitats. SG 80 is met. Changes in all habitat distributions over time are measured. SG 100 requirements are met.				
References				

None	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	More information is sought on the frequency of lost gear by the UoA and what are the reporting requirements when gear is lost.
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

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	No
Rationale				
The element considered of primary importance and most likely to be threatened by the fishing activities is that of trophic structure. A fishery can alter the structure and functioning of ecosystems by removing forage species upon which higher trophic level species depend, or through top-down trophic cascades or fishing down the food web. Andersen and Pedersen (2009) use a size- and trait-based model to explore how marine ecosystems potentially react to different types of fishing pressure and conclude that cascades are damped further away from the perturbed trophic level. Fishing on several trophic levels leads to a disappearance of the signature of trophic cascades. Management of tuna fisheries by ICCAT potentially mitigate depletion of top predators and make it highly unlikely that the underlying ecosystem structure and function will be disrupted to a point of serious or irreversible harm. Furthermore, Pershing et al. 2015 noted that trophic cascade regime shifts are rare in open ocean ecosystems. We consider that the fishery is highly unlikely to disrupt trophic structure of the ecosystem to extreme irreversible levels, due to the scale at which the fishery operates relative to the scale of species distributions impacted by the fishery. The fishery does not remove a substantial amount of high trophic level species (retained or discarded) relative to the overall abundance of these species, nor does the fishery impact lower trophic levels. The assessment team concludes that it is highly unlikely that the UoA disrupts key elements of ecosystem structure and function to the point where there would be serious or irreversible harm; SG 80 is met. Recent evidence indicates that it is highly unlikely (i.e. <20th %tile, in TableSA9) that pelagic longline fisheries impact key elements of ecosystem structure and function to the point where there would be serious or irreversible harm (Pershing 2015). However, there is no direct evidence that the UoA has no impact. On this basis SG 100 is not met.				
References				
Andersen and Pedersen (2009); Pershing (2015)				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range			≥80	

Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

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				
At the regional level, the 1995 FAO Code of Conduct for Responsible Fisheries is used as the framework for sustainable fisheries for an "Ecosystem Approach to Fisheries Management (EAFM)". The RFMOs application of the FAO code extends to the highly migratory fish species including tuna through adopted conservation measures for bigeye, yellowfin and skipjack, as well as to the management and protection of non-target species, in particular sharks and bycatch species. Although not specifically designed to manage impacts on the ecosystem, the range of measures in place is considered to represent a strategy that works to achieve the intended outcome. We note that there is no specific ecosystem management plan in the RFMOs but SA3.17.3.2 states that 'It may not be necessary to have a specific "ecosystem strategy" other than that which comprises the individual strategies for the other components under P1 and P2." 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. This meets the SG 60 and SG 80 levels. As there is no 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, the SG 100 level 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/ 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	No
Rationale				
The regional stock assessments indicate that current harvest strategies and management measures have been successful in generally maintaining the target species around the BMSY level (we note this may not be the case				

for all species). The strategy considers the significant sources of fishery related risks to the Atlantic Ocean ecosystem, namely the removal of the target species, risks associated with impacts of bycatch, and discarding of a wide range of non-target species. Overall, the strategy is considered likely to work. The ecosystem modelling (described under PI 2.5.1), together with the current and projected future healthy status of the key tuna species, are results of a form of testing for the specific ecosystem that provides an objective basis for confidence that the measures will work. On this basis, the SG 60 and SG 80 levels are met. Given that there has been no testing, requirements at the SG100 level are not 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 objective as set out in scoring issue (a).
	Met?		Yes	Yes
Rationale				
As previously indicated, regional stock assessments show that current harvest strategies and management measures have largely been successful in maintaining target species at around the BMSY level. Available ecosystem modelling suggests it is unlikely the client fishery is having an irreversible impact on ecosystem functioning. Improved observer coverage for the longline fishery would provide better information relevant to monitoring ecosystem impacts from that sector. Nevertheless, overall, there is evidence that measures are being implemented successfully. There is some evidence that the measures/partial strategy is being implemented successfully. SG 80 is met. 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), SG 100 requirements are met.				
References				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	More information sought on bycatch handling practices, future observer coverage decisions and measures to collect fate data associated with released animals.
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.3 – Ecosystem information

<table>
<tr><td colspan="2">PI 2.5.3</td><td colspan="3">There is adequate knowledge of the impacts of the UoA on the ecosystem</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Information quality</td></tr>
<tr><td>Guide post</td><td>Information is adequate to identify the key elements of the ecosystem.</td><td>Information is adequate to broadly understand the key elements of the ecosystem.</td><td></td></tr>
<tr><td>Met?</td><td>Yes</td><td>Yes</td><td></td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">Information is adequate to broadly understand the key elements of the North and South Atlantic Ocean ecosystems. Key elements include the trophic structure of the North and South Atlantic Ocean ecosystems such as key prey, predators and competitors, community composition, productivity patterns and characteristics of biodiversity and is accessible through the Large Marine Ecosystems Hub (https://www.lmehub.net/) and Kelley (2016). This meets requirements at the SG60 level. We note information relevant to the management of fisheries impacts in the Atlantic Ocean is available through various ICCAT tuna species working groups (e.g., Bluefin Tuna Species Group) and the Sub-Committee on Ecosystems, allowing ecoregions suitable for management of species managed by ICCAT to be defined. Sherman et al. (2013) investigated changing states of North Atlantic large marine ecosystems and Forrestal (2016) developed a provisional Atlantic Ocean ecosystem model based on purse seine data from the Atlantic Ocean. While the ecosystem model by Forrestal (2016) has not been adopted for use by ICCAT for management purposes it does identify and specify the key ecosystem elements and their major interrelationships.

Information is adequate to identify the key elements of the ecosystem. SG60 is met.

Information is adequate to broadly understand the key elements of the ecosystem. On this basis SG80 is met.</td></tr>
<tr><td rowspan="3">b</td><td colspan="4">Investigation of UoA impacts</td></tr>
<tr><td>Guide post</td><td>Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.</td><td>Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.</td><td>Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail.</td></tr>
<tr><td>Met?</td><td>Yes</td><td>Yes</td><td>No</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">The main interaction between the fishery on key elements of the ecosystem can be inferred from existing information (logbook and observer data), The main impacts of the fishery on key elements of the ecosystem are mortality of top predators with the potential for altering the food web. The food web of the ecosystems in the areas where the fishery occurs is broadly understood and some ecosystems have been investigated in detail (Sherman et. al., 2013).

Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail. SG60 is met.

Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail. SG80 is met.</td></tr>
</table>

While inferences on impacts to the ecosystem resulting from the removal of top predators can be inferred from existing information, a detailed or comprehensive investigation has not been conducted. On this basis SG100 is not met.				
c	Understanding of component functions			
	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				
Information on target and non-target species is gathered through logbook data and the regional observer programs, as well as being available via a number of historical research projects. The main functions of the components of the ecosystem (P1 target species, primary, secondary and ETP species and Habitats) are known and sufficient information is available to identify the range of species that are impacted and their respective roles. This has led to the development of a provisional ecosystem model (Ferrestal 2016). The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known. On this basis SG80 is met. Ecosystem plans based on proposed delineated ecoregions in the Atlantic Ocean (Juan-Jorda et al. 2019) have been investigated and provisional ecosystem indicators developed (Juan-Jorda et al. 2020) allowing ecological impacts from fishing to be inferred due to fishing. 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. On this basis SG100 is met.				
d	Information relevance			
	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	Yes
Rationale				
Information on target and non-target species (bycatch and ETP species) is gathered through logbook data and the regional observer programme, as well as being available via a number of historical research projects. Sufficient information is available to identify the range of species that are impacted and to potentially determine their respective roles--e.g. their trophic level and potential roles in transfer of energy and nutrients between various pelagic habitats (epipelagic, mesopelagic and bathypelagic) or between pelagic and demersal habitats. In order to improve the availability of data, the Kobe Bycatch Technical Working Group (KBTWG) was established in 2009 to identify, compare and review the data fields and collection protocols of logbook and observer bycatch data being employed by each tuna RFMO. The KBTWG provides guidance for improving data collection efforts and, to the extent possible, the harmonization of data collection protocols among tuna RFMOs. These data are intended to improve future analysis of ecosystem functions. 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. On this basis SG80 is met. Since 2017 the ICCAT Sub-Committee on Ecosystems is working on developing an Ecosystem Report Card. This Report Card aims to highlight and monitor the state of several components of the ecosystem impacted by, or important to, the operation of ICCAT fisheries. The Ecosystem Report Card intents to be used as a tool to report on the				

sustainability of species and stocks under ICCAT management responsibilities and the impact of their fisheries on the structure and function of marine ecosystems to the Commission. The Subcommittee on Ecosystems has defined broad operational components of the ecosystem to be highlighted and monitored in the Ecosystem Report Card. These include: retained species, non-retained species including seabirds, marine turtles, marine mammals and sharks, food-webs/trophic relationships, socio economic, fishing pressure, environment and habitats. In 2018 a series of indicator-based assessments were produced for each of these operational ecosystem components and reviewed by the Sub-Committee on Ecosystems. Each assessment proposed and calculated a series of indicators that could potentially be used to monitor the state of that particular ecosystem component. Based on these indicator-based assessments, the first example of Ecosystem Report Card was produced in 2018. On this basis the assessment team considers 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; SG100 is met.				
e	Monitoring			
	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				
Data are collected on the key target and non-target tuna and billfish species taken by the fishery through logbooks and the regional observer program and are submitted to the ICCAT annually. On this basis, adequate data continue to be collected to detect any increase in risk level; SG80 is met. In addition, sufficient and adequate information is now being collected to detect any increase in risk to main bycatches of commercial and non-commercial species, and when integrated with abiotic data is adequate to support the development of strategies to manage ecosystem impacts hence, permitting the development of strategies to manage ecosystem impacts (Morato et al. 2016). On this basis SG100 is met.				
References				
Sherman et al. 2013, Morato et al. 2016; Kelley 2016; Forrestal et al. 2016; Juan-Jorda et al 2019; Juan-Jorda et al. 2020				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

4.4 Principle 3

4.4.1 Principle 3 background

4.4.1.1 Area of Operation and Relevant Jurisdictions

The Atlantic Albacore pelagic longline fishery component for this Tuna Alliance Unit of Assessment operates on the high seas within the North and South Atlantic Ocean area. The UoA does not include fishing operations within adjacent EEZ's. There are 19 vessels; flagged to Taiwan.

For the UoA, a typical fishing trip lasts for 3-4 months; with port calls for around 1 week; there are usually 3-4 trips each year. At the end of the calendar year, once vessels have exhausted their Albacore quota, they would usually remain in port for around a month. Albacore are the primary target species, accounting for around 60% of landed catch; these are unloaded in containers and shipped, frozen, to buyers. Commercially valuable bycatch is predominantly comprised of bigeye and yellowfin tuna, swordfish, marlin, and sharks. All of these species are recognised as Highly Migratory Species under UNFSA, and all are managed via the relevant regional fisheries management organisations for the areas they are taken.

The International Commission for the Conservation of Atlantic Tunas (ICCAT) is the relevant RFMO for the fishery's UoA. Southern Bluefin Tuna (SBT) are also taken by pelagic longline in the UoA area, and all catches must be covered by quota allocated and managed by the Commission for the Conservation of Southern Bluefin Tuna (CCSBT).

The main ports used for unloading include Port of Spain (Trinidad); Cape Town (South Africa) and Montevideo (Uruguay). Vessels may also unload in Dakar (Senegal).

As the fishery operates exclusively on the high seas, jurisdiction and management responsibility is shared across both ICCAT and the relevant Flag State (Taiwan). For Taiwanese flagged vessels the Taiwan Fisheries Agency (TFA) is the primary national management agency.

International Commission for the Conservation of Atlantic Tunas (ICCAT)

ICCAT is the principal Regional Fisheries Management Organisation (RFMO) responsible for the sustainable management of highly migratory tuna, tuna-like and associated pelagic species taken in the fishery's UoA. Contracting Parties and Cooperating non-Contracting Parties, Entities, and Fishing Entities (collectively referred to as CPCs) work together to enable progress towards ICCAT's sustainable fishery objectives with a focus on target fish stock biology, estimates of stock abundance, and associated research, data collection and analysis for population assessments and trends for both target and key bycatch species caught incidentally, such as sharks.[3]

[3] See: http://www.fao.org/fishery/rfb/iccat/en

ICCAT's primary objective is described in Article VIII of the Convention vis: "*on the basis of scientific evidence, make recommendations designed to maintain the populations of tuna and tuna-like fishes that may be taken in the Convention area at levels which will permit the maximum sustainable catch*."

Current member countries of ICCAT include Albania, Algeria, Angola, Barbados, Belize, Brazil, Canada, Cabo Verde, China, Côte d'Ivoire, Curaçao, Egypt, El Salvador, Equatorial Guinea, European Union, France, Gabon, Ghana, Guatemala, Guinea, Honduras, Iceland, Japan, Liberia, Libya, Morocco, Mauritania, Mexico, Namibia, Nicaragua, Nigeria, Norway, Panama, Philippines, Republic of Korea, Russian Federation, Saint Vincent/Grenadines, Sao Tome and Principe, Senegal, Sierra Leone, South Africa, Syrian Arab Republic, Trinidad and Tobago, Tunisia, Turkey, United Kingdom, United States of America, Uruguay, Vanuatu, Rep. of Venezuela. Formally recognised cooperating States include Bolivia, Guyana, Suriname, and Taiwan.

As for other Tuna focused Regional Fisheries Management Organisations (T-RFMO's), ICCAT relies on a range of formal committees, panels and working groups to guide work on key fisheries management, scientific research, and data initiatives. These include the Standing Committee on Finance and Administration (STACFAD), and the Standing Committee on Research and Statistics (SCRS). The SCRS is ICCAT's lead scientific advisory committee, focused on collecting statistical data covering catch and effort information and relevant biological information for target and key bycatch species. The SCRS also coordinates research, including multilateral cooperative research initiatives, carries out stock assessments, and provides advice to the Commission in relation to development and implementation of relevant conservation and management focused Resolutions and Recommendations. There are also four species specific advisory Panels operating under the guidance of the SCRS. These arrangements are summarized below.

Table 27. ICCAT's key advisory committees and working groups. Source: ICCAT.

Committee Acronym	Description and Function
STACFAD	STACFAD Standing Committee on Finance and Administration
SCRS	Standing Committee on Research and Statistics • Bluefin Species Group • Working Group on Stock Assessment Methods • Data preparatory Meetings • Species Stock Assessment Meetings • Bluefin MSE Technical Group • Species Group Meetings • Shortfin Mako Stock Assessment Update Meeting • Sub-Committee on Ecosystems (ECO)
Advisory Panels	Panel 1: Tropical tunas (yellowfin, bigeye and skipjack) Panel 2: Northern temperate tunas (albacore and Atlantic bluefin) Panel 3: Southern temperate tunas (albacore and southern bluefin) Panel 4: Other species (swordfish, billfishes, small tunas)
CoC	Conservation & Management Measures Compliance Committee
PWG	Permanent Working Group for the Improvement of ICCAT Statistics and Conservation Measures

SWGSM	Standing Working Group on Dialogue between Fisheries Scientists and Managers

The Benguela Current Convention

The Benguela Current is a highly productive temperate marine upwelling system and associated large marine ecosystem off the west coast of Southern Africa. The Benguela Current Convention (BCC) is a formal treaty between the governments of Angola, Namibia and South Africa that sets out the countries' intention "*to promote a coordinated regional approach to the long-term conservation, protection, rehabilitation, enhancement and sustainable use of the Benguela Current Large Marine Ecosystem, to provide economic, environmental and social benefits*."[4] The governments of Angola, Namibia and South Africa signed the Benguela Current Convention in the Angolan city of Benguela on 18 March 2013.

The Benguela Current Convention also establishes the Benguela Current Commission (BCC), existing since 2007, as a permanent inter-governmental organisation. The convention recognises the need for a Large Marine Ecosystem concept of ocean governance – a move towards managing resources at the larger ecosystem level (rather than at the national level) and balancing human needs with conservation imperatives necessary to maintain the productivity and biodiversity of this unique ocean system. The BCC is based in Swakopmund, Namibia, and is focused on the management of shared fish stocks, environmental monitoring; biodiversity and ecosystem health.

Taiwan

Taiwan is classified as a Flag State and Distant Water Fishing Nation (DWFN) for the purpose of the assessment, with fisheries management responsibilities spanning international agreements (e.g., ICCAT, UNFSA), as well as national fisheries legislation and policies. Central authority over commercial fisheries for Taiwan flagged vessels is vested in the Council of Agriculture, with the Taiwan Fisheries Agency (TFA) based in Kaohsiung acting as the principal management authority. There is also a Fisheries Research Centre based in the port city of Keelung. The key fisheries management acts are administered by the Fisheries Agency (Council of Agriculture of the Executive Yuan), and there is a Deep Sea Fisheries Division, responsible for managing all aspects of fishing operations as they relate to distant water fishing; including issuing licenses, monitoring VMS, port inspections, recording data, monitoring quota or harvest limits, placement of observers, transshipment, enforcement (with the Coast Guard), MCS related investigations and where necessary penalties and sanctions for infringements.

4.4.1.2 National Level Management

The management of Taiwan's Distant Water Fishing Fleet is governed via a suite of regulations. At the national level, key legislation includes the Fisheries Act (2016) and the Distant Water Fisheries Act (2016).

4 See: https://www.benguelacc.org/index.php/en/about/the-benguela-current-convention.

These evolved from earlier national fisheries legislation and came into force in early 2017. Part of the incentive for the new legislation was the previous identification of Taiwan by the European Union as a possible non-cooperating nation regarding IUU fishing (referred to as a “yellow card”) (SCS, 2018). The relevant new legislative arrangements include:

- Act Governing Distant Water Fisheries (遠洋漁業條例);
- Amendments to the Fisheries Act (漁業法) passed in early July 2016;
- The Ordinance to Govern Investment in the Operation of Foreign Flag Fishing Vessels (投資經營非我國籍漁船管理條例); and
- The Enforcement Rules of the Fisheries Act.

Taiwan’s new international fisheries legislative framework is now pivotal to the performance of the flag state fleet relative to the MSC standard, and sustainable distant water fishing more broadly.

Roles and Responsibilities

For Taiwan, central authority over commercial fisheries is vested in the Council of Agriculture. Under the Council of Agriculture, there are two separate government organizations: the Taiwan Fisheries Agency (TFA) based in Kaohsiung and the Fisheries Research Centre based in Keelung, both of which have complex institutional histories and appear to have no formal overlap in shared responsibilities for fishery management (SCS, 2018).

The key fisheries management laws are administered by the Fisheries Agency (Council of Agriculture of the Executive Yuan). The Taiwan Fishery Agency, Council of Agriculture has a Deep-Sea Fisheries Division which is responsible for managing all aspects of fishing operations as they relate to distant water fishing, including issuing licenses, monitoring VMS, port inspections, recording data, monitoring quota or harvest limits, placement of observers, transshipment, enforcement (with the support of Taiwan’s Coast Guard), and compliance and/or prosecutions[5]. TFA’s organizational chart (below) identifies a series of bodies dealing with its operations as a Distant Water Fishing Nation.

Decision Making

Taiwan’s Fisheries Act (2016) is the more general of the two Acts and acts primarily to guide decision making and policy formulation for domestic fisheries management, aquaculture and enforcement. It has a range of provisions including who can be granted a license, build a fishing vessel, work on fishing vessels, and receive access rights. It also has chapters on recreational fishing, fishery development, conservation and management, and penalty provisions.

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[5] Details provided via TFA website at: https://www.fa.gov.tw/en/

More relevant to the UoA is Taiwan's Distant Water Fisheries (DWF) Act (2016). This is specifically tailored to the management and enforcement of Taiwan vessels fishing on the high seas or a third country's EEZ[6]. It has objectives to:

- Ensure the conservation of marine fisheries resources;
- Strengthen distant water fisheries management;
- Curb IUU fishing; and
- Improve traceability of catches and fisheries product so as to promote the sustainable operation of distant water fisheries.

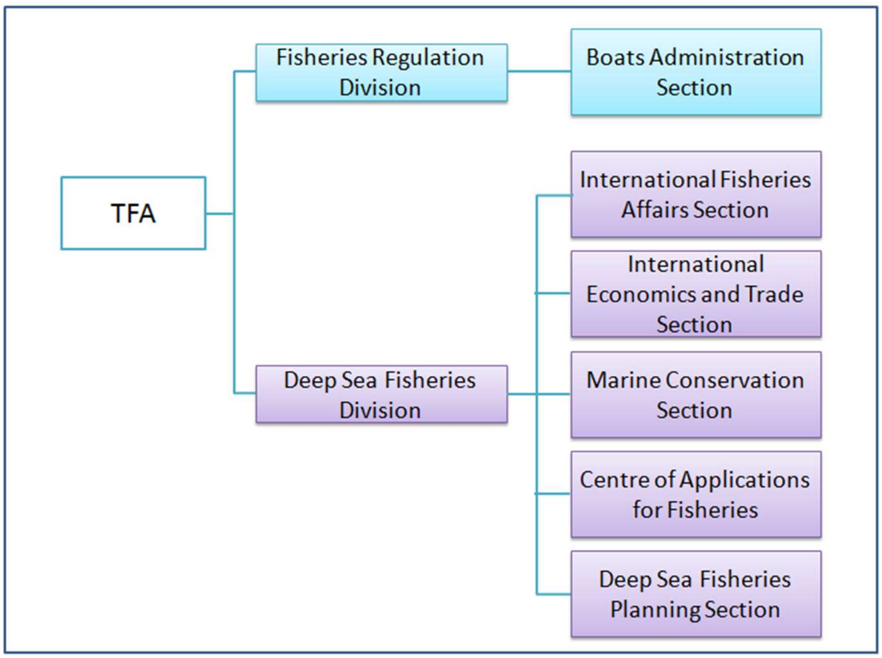

Figure 29. Taiwan Fisheries Agency Organisational Chart. Source: SCS, 2018

Article 5 of the DWF Act requires that the fisheries agency develop arrangements which have regard to the precautionary principle, ecosystem-based approach and the use of the best available scientific advice. SCS auditors (pers. Comm) based on recent onsite meeting discussions with TFA staff, describe a well-established regulatory process by which T-RFMO management and conservation measures are incorporated into domestic legislation. This iterative and consultative process may result in some modification to the measures, and that proposed legislation can be vetoed by the Legislative Yuan or by the Committee of the Whole Yuan (SCS, 2018).

[6] Generally understood to mean an entity not party to an agreement between two other countries. Even more generally, the term is used to denote a country other than two specific countries referred to, e.g. in the context of trade relations.

4.4.1.3 Fishery-Specific Management

Sustainable fisheries management objectives and measures to achieve outcomes consistent with MSC principles 1-3 are given effect primarily through the relevant regional fisheries management framework (ICCAT for this UoA); and the relevant national legal and policy frameworks. Taiwan's longer term sustainable fisheries objectives, as reflected in domestic legislation, are also consistent with these international agreements.

As for other T-RFMO's ICCAT has key fisheries management objectives that align with both the UN Fish Stocks Agreement, and FAO's Code of Conduct for Responsible Fisheries. ICAAT's principal objective, set out in Article VIII of the ICCAT Convention, is to "*maintain the populations of tuna and tuna-like fishes that may be taken in the Convention area at levels which will permit the maximum sustainable catch*". Furthermore, ICAAT is required in making decisions pursuant to this overriding objective to also:

- Apply an ecosystem-based approach to fisheries management (Resolution 15-11 refers); and
- Use a precautionary approach in implementing ICCAT conservation and management measures (Resolution 15-12 refers).

Examples of the application of these longer-term objectives to both MSC principles 1 and 2 by ICCAT include:

- for principle 1, the objective of recovering the Atlantic Bluefin Tuna stock to a level equivalent to spawning biomass at maximum sustainable yield (SSB_{MSY}) by 2022; and a goal of limiting catches to the most precautionary estimate of MSY provided by the ICAAT SCRS (ICCAT Recommendations 16-09 and 17-07 refer).
- For principle 2, the SCRS also oversee a sub-committee on ecosystems with the objective of ensuring ICAAT pursues the FAO's Ecosystem Approach to Fisheries. Similarly, a shark specialist group provides scientific advice, including stock assessments and ecological risk assessments where required to ensure shark sustainability. The SCRS Strategic Research Plan for 2015-2020 also includes the objective of data needs for Provision of Ecosystem Based Fishery Management Advice (Control Union, 2020).

Operational objectives giving effect to ICCAT's fisheries management objectives and obligations are expressed via an extensive suite of formally agreed Resolutions and Recommendations. The full range of these are provided on ICCATS website and updated annually7. A subset of these, most relevant to the UOA fishery, are provided below.

[7] See: https://www.iccat.int/Documents/Recs/COMPENDIUM_ACTIVE_ENG.pdf

Table 28: Current and relevant ICCAT Recommendations for the UoA. Source: ICCAT.

ICCAT Recommendation	Title and Purpose
Rec. 20-05	Supplemental recommendation by ICCAT to amend Recommendation 16-07 on South Atlantic Albacore catch limits for the period 2017-2020
Rec. 20-04	Recommendation by ICCAT amending recommendation 17-04 on a harvest control rule for North Atlantic Albacore supplementing the multi-annual conservation and management programme in rec. 16-06
Rec. 20-03	recommendation by ICCAT amending recommendation 16-06 establishing a multi annual conservation and management programme for North Atlantic Albacore.
Rec. 19-02	Recommendation by ICCAT to replace recommendation 16-01 on a multi-annual conservation and management programme for tropical tunas.
Rec. 20-01	Supplemental recommendation by ICCAT to amend the recommendation 19-02 on a multi-annual conservation and management programme for tropical tunas
Rec. 18-01	Recommendation by ICCAT Supplementing and Amending Recommendation 16-01 on a Multi Annual Conservation and Management Programme for Tropical Tunas
Rec. 18-02	Recommendation by ICCAT Establishing a Multi-Annual Management Plan for Bluefin Tuna in the Eastern No. Atlantic and the Mediterranean Sea
Res. 18-03	Resolution by ICCAT on Development of Initial Management Objectives for Eastern and Western Bluefin Tuna
Rec. 18-04	Recommendation by ICCAT to Replace Rec. 15-05 to Further Strengthen the Plan to Rebuild Blue Marlin and White Marlin Stocks
Rec. 16-06	Recommendation by ICCAT on a Multi-annual Conservation and Management Program for North Atlantic Albacore
Rec. 16-07	Recommendation by ICCAT on the Southern Albacore Catch Limits for the Period 2017 to 2020
Rec. 17-04	Recommendation by ICCAT on a Harvest Control Rule for the North Atlantic Albacore Supplementing the Multiannual Conservation and Management Programme,
Rec. 17-05	Recommendation by ICCAT Establishing Management Measures for the Stock of Mediterranean Albacore
Rec. 18-05	Recommendation by ICCAT on Improvement of Compliance Review of Conservation and Management Measures Regarding Billfish Caught in the ICCAT Convention Area
Rec. 18-06	Recommendation by ICCAT to Replace Recommendation 16-13 on Improvement of Compliance Review of Conservation and Management Measures Regarding Sharks Caught in Association with ICCAT Fisheries
Rec. 18-07	Recommendation by ICCAT to Amend ICCAT Reporting Deadlines in Order to Facilitate an Effective and Efficient Compliance Process
Rec. 18-08	Recommendation by ICCAT on Establishing a List of Vessels Presumed to have Carried out Illegal, Unreported and Unregulated Fishing Activities
Rec. 18-09	Recommendation by ICCAT on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing
Rec. 18-10	Recommendation by ICCAT Concerning Minimum Standards for Vessel Monitoring Systems in the ICCAT Convention Area

ICCAT Recommendation	Title and Purpose
Res. 18-11	Resolution by ICCAT Establishing a Pilot Program for the Voluntary Exchange of Inspection Personnel in Fisheries Managed by ICCAT
Rec. 18-12	Recommendation by ICCAT Amending Recommendation 17-09 on the Application of the eBCD System
Rec. 18-13	Recommendation by ICCAT Amending Recommendation 11-20 on an ICCAT Bluefin Tuna Catch Documentation Program
Rec. 18-14	Recommendation by ICCAT Amending Four Recommendations and One Resolution
Rec. 19-02	Recommendation by ICCAT to replace Recommendation 16-01 by ICCAT on a multi-annual conservation and management programme for tropical tunas
Rec. 19-03	Recommendation by ICCAT amending the Recommendation 17-02 by ICCAT for the conservation of North Atlantic swordfish
Rec. 19-04	Recommendation by ICCAT Amending the Recommendation 18-02 establishing a multiannual management plan for bluefin tuna in the eastern No. Atlantic and the Mediterranean
Rec. 19-05	Recommendation by ICCAT to establish rebuilding programs for blue marlin and white marlin/roundscale spearfish
Rec. 19-06	Recommendation by ICCAT on the conservation of North Atlantic stock of shortfin mako caught in association with ICCAT fisheries
Rec. 19-07	Recommendation by ICCAT amending the Recommendation 16-12 on management measures for the conservation of the North Atlantic blue shark caught in association with ICCAT fisheries
Rec. 19-08	Recommendation by ICCAT on management measures for the conservation of South Atlantic blue shark caught in association with ICCAT fisheries
Rec. 19-09	Recommendation by ICCAT on vessel sightings Rec. 19-10 Recommendation by ICCAT on protecting the health and safety of observers in ICCAT's regional observer programs
Rec. 19-11	Recommendation by ICCAT on abandoned, lost or otherwise discarded fishing gear
Rec. 19-12	Recommendation by ICCAT to continue the development of an integrated online reporting system
Rec. 18-01	Recommendation by ICCAT Supplementing and Amending Recommendation 16-01 on a Multi Annual Conservation and Management Programme for Tropical Tunas

ICCAT's Recommendation on "Criteria for the Allocation of Fishing Possibilities" relates to the potential allocation of quota rights to CPC's; including provisions for allocation of rights and recognition of the interests of artisanal, subsistence, small-scale coastal fishers and their communities, and coastal states[8].

8 See: https://www.iccat.int/Documents/Recs/compendiopdf-e/2015-13-e.pdf

Taiwan

As the UoA fishery is a high seas fishery targeting straddling stocks of tuna and tuna like species, the principal long term and key operational objectives of the fishery are agreed to under the umbrella of ICCAT, in accordance with the UNFSA and related agreements.

Taiwan's domestic process for giving effect to RFMO management measures has been described by SCS (2018) for WCPFC, however this process is also relevant for other key T-RFMO's including ICCAT for this UOA.

In summary, TFA and the Overseas Fishery Department of Council (OFDC) summarize existing CMMs, any related meeting reports published on WCPFC website about the change of CMMs and new proposed CMMs. This occurs one month before any WCPFC Regular Meeting Commission. In this period before a Commission meeting, the TFA and OFDC consult with interested parties such as the domestic Tuna Association, and Longline Association to refine proposals that can then become a national position… After the meeting, and in order to adopt the fishery specific measures into domestic law, the Deep-Sea division of TFA will facilitate carriage of the proposal through the Legislative Yuan to carry out examination and revision. After passing the regulation, the Council of Agriculture, under Executive Yuan, will be assigned to establish the policy and procedures associated with the regulation (SCS, 2018).

When new regulations are proposed, the TFA provide a pre-notice, for a period of 3-4 weeks, for the public to provide input on changes in legislation, which are then considered by the agency. (SCS, 2018).

In addition to the national legislative framework for Taiwan's distant water fleet, and the current suite of ICAAT Resolutions and Recommendations applying to Taiwan as an ICCAT CPC, Taiwan's NPOA Seabirds and NPOA Sharks also contains a list of prescribed measures to reduce the incidental mortality of shark species' and seabirds during longline fishing operations, including mandatory mitigation measures for seabirds such as tori lines, weighted swivels and gear to avoid diving seabirds taking baits; and rules in relation to night setting of gear to reduce incidental seabird catches[9].

For sharks, Taiwan's NPOA measures[10] are designed to be consistent with the relevant ICCAT Resolutions and Recommendations, including prohibition on shark finning and adherence to the relevant landed catch to fin ratios. Whilst levels of observer coverage are relatively low on ICCAT longline vessels, catch and effort data on sharks is also collected and provided annually by Taiwan as part of its reporting obligations under the ICCAT arrangements.

[9] See: https://www.fa.gov.tw/upload/205/2014100217401169904.pdf

[10] See: https://www.fa.gov.tw/en/Policy/content.aspx?id=5&chk=505be529-a59a-4528-99f3-7ce83f45261d

Review and Audit of the Management Plan

Each of the regional tuna RFMO's, including ICCAT have mechanisms in place to evaluate key aspects of their regional highly migratory species' management frameworks. These include key committees (e.g. SCRS and COC), species specific Panels, and working groups that meet regularly and report their findings back to the Commission's annual meeting – or out of session if required. The RFMO Secretariat, with assistance from the relevant panel or committee, then submits a report detailing the level of compliance of members with both the management measures, and related reporting obligations.

For ICCAT, implementation progress for relevant management measures is generally monitored through the reporting provisions within the measures themselves (e.g., Resolutions or Recommendations), or via members Annual Reports to the Commission. The formal sub-committees and working groups also work closely with members and other stakeholders to develop Resolutions and Recommendations, and to evaluate and refine these after they have been implemented. Stock assessments overseen by the SCRS and other experts, including members scientists, are subject to peer review by other members of the Scientific Committees; as well as occasional external review, and are closely scrutinized by member countries and their scientific representatives.

In part as a response to recommendations from the 2007 Kobe (Japan) joint meeting of tuna RFMO's, ICCAT announced an independent review of its performance against stated objectives (ICCAT 2009). This review was conducted by an independent external panel with the objective of strengthening the mandate of ICCAT and improving its management performance. The panel found that:

- Fundamentally ICCAT's performance to date does not meet its objectives for several of the species involved;
- ICCAT's performance failings result primarily from poor compliance by many CPCs;
- CPCs performance supplying timely and accurate MCS related data for their national fishing companies was consistently poor;
- ICCAT CPCs' performance in managing Atlantic bluefin tuna, particularly in the eastern No. Atlantic and Mediterranean Sea was widely recognised as being poor;
- There were concerns about transparency within ICCAT both with respect to decision making and in resource allocation; and
- Most of the performance shortcomings identified for ICCAT would be resolved if CPCs demonstrated the political will to fully implement the agreed management measures and related recommendations of ICCAT (ICCAT 2009).

In 2016 a similar independent review was initiated by ICCAT to review the organization's subsequent performance, finding:

- there are fundamentally sound measures in place to conserve stocks in line with ICCAT's objective of maintaining stocks at BMSY; -and notable progress has been made in rebuilding overfished stocks, with the exception of marlins;

- management of ecologically related species including sharks, seabirds and turtles was also generally sound relative to other tuna RFMO's species; ICCAT's quota management allocation schemes for most of the key stocks generally works in a complementary fashion with implementation of the conservation and management measures, and these are refined as required;
- Introduction of an annual review of CPCs' compliance performance has been a positive step although this should focus more on compliance with substantive fisheries regulations and less on minor data deficiencies and not on the submission of data issue;
- MCS measures, including improved Port State Measures and more regular polling from VMS units are also positive steps; and
- Improvements to transparency and consultation, with initiatives to enable non-governmental organisations (NGOs)participation at annual ICCAT meetings.

Since the 2016 review[11], ICCAT and its members continue to face some significant challenges, including implementation of effective management strategies for preventing overfishing, and to rebuild key stocks, including Atlantic Bigeye and Yellowfin Tuna, Swordfish, and Marlins. There has also been slow progress toward catch allocations and scientifically based catch limits, as well as the development of species-specific harvest strategies (Pew 2019[12]).

For Mediterranean Swordfish, ICCAT's scientific models conclude that the stock is overfished, and that overfishing continues to occur; with the Commission's 2016 recovery plan having a very low likelihood of success by 2025. For ICCAT's tropical tuna management, there were also recommendations for improvement in the 2016 performance review. For example, seeking improved FAD management of juvenile mortality, and more effective management strategy approaches with higher probabilities of success. At recent annual meetings, ICCAT CPC's have also disagreed on adoption of a Bigeye management plan, with nearly all of the scientific modelling continuing to suggest that bigeye is overfished, and that overfishing continues. For Yellowfin Tuna, review recommendations suggested a catch allocation arrangement which has not yet been implemented. ICCAT's Yellowfin Tuna TAC has been exceeded by up to 41,000 tonnes in recent years. Additionally, longline observer coverage remains inadequate to more accurately characterize broader impacts and risks of fishing operations (Pew 2019).

On a more positive note, ICCAT has acted on other recommendations to the effect of strengthening port state measures, and improving VMS coverage for more frequent location reporting, these were both recommendations of the two earlier performance reviews (ICCAT 2009, 2016).

[11] See: https://www.un.org/depts/los/convention_agreements/ICSP14/RFBs&RFMOs/ICCAT.pdf
[12] See: https://www.un.org/Depts/los/convention_agreements/ICSP14/NGOs/Pew.pdf

Decision Making Processes

In general, decision-making processes within the tuna fishery RFMO's rely on consensus. If consensus cannot be reached, a vote may usually be taken. For ICCAT, Resolution 15-12 requires a precautionary approach in implementing ICCAT conservation and management measures.

To guide effective decision making, ICCAT use expertise-based Panels to guide development and review of species-specific management recommendations, with outcomes guiding decision making at the annual ICCAT meeting. Similarly, expertise based ICCAT Working Groups (e.g. Working Group on FADs) cooperatively develop management measures for consideration and approval at the Plenary Session of Commission meetings.

As for other T-RFMO's, ICCAT decision making recognises the overarching objectives and guiding principles of the UNFSA and subsidiary agreements. Decisions integrate scientific advice from members and various research programmes, as well as the suite of fisheries related data provided by members and cooperating nonmembers. This includes data sourced from VMS, logbooks, independent fishery observers, and stock assessment results and advice (Control Union, 2020).

ICCAT has a generally inclusive approach to stakeholder participation and this is also reflected in decision making processes. There are some subsidiary committees and meetings where information is more sensitive, or confidential, and stakeholder participation is more limited. Despite this the development and agreement of final recommendations is undertaken in plenary session where participation is more open. Under ICCAT Recommendation 14-13[13], the SWGSM is intended to facilitate better understanding between fisheries managers and scientists and improve implementation of management strategies.

To aid transparency, information provided by ICCAT CPCs, along with decisions taken and the Commissions rationale for decisions are generally available via ICCAT's website. This website has been recently improved in order to improve its user-friendliness as a result of recommendations from the most recent ICCAT independent performance review (ICCAT 2017).

4.4.1.4 Recognized Interest Groups

For the UoA, key longline fishery stakeholders and interest groups include domestic and foreign fishers and related companies; as well as supply chain related stakeholders including fish processing facilities, canneries, and a diverse range of local and national government bodies related to fisheries. Other primary interest groups include fishing industry organizations, fishery management and research entities, local/customary fishers, and environmental NGO's.

[13] See: https://www.iccat.int/Documents/Recs/COMPENDIUM_ACTIVE_ENG.pdf

The most active environment and conservation focused NGO's and charitable trusts focusing on sustainable management of international pelagic longline fisheries for highly migratory species include Birdlife International, Conservation International, Environmental Defense Fund, Fishwise, Greenpeace, International Seafood Sustainability Foundation (ISSF), The Nature Conservancy, PEW Charitable Trusts, the Sustainable Fisheries Partnership, and World Wildlife Fund (WWF)[14]. There are also a range of smaller and more localized e-NGO organizations active in regional areas within the UoA area.

4.4.1.5 Planned Education and Training for Interest Groups

Birdlife International and other key environmental NGO's periodically engage with major DWFN's including Taiwan to provide seabird bycatch identification guides and technical guidance for fishery program managers and skippers operating in relevant RFMO regions[15]. For example, In December 2016, a compliance workshop was also held in Fiji to collaborate with DWFV's on mitigation of shark, seabird and sea turtle bycatch by tuna vessels, as well as providing training on the correct way to complete fishery logbooks, and guidance on the transition to electronic fishing logs (Shen and Huang, 2020).

Consultation

ICCAT

In general, ICCAT's consultation and engagement processes are well structured and operate consistently to provide members and cooperating nonmembers with ongoing and timely access to relevant fisheries information. Consultation takes place during plenary and subordinate committee meetings to apply these data in support of the agreed fishery sustainability objectives. These processes are evidenced by ICCAT's extensive online meeting records (for both plenary and committees), and the development and implementation of formal ICCAT Recommendations and Resolutions for implementation by members.

The ICCAT convention text and measures provide information on the functions, roles and responsibilities of member states, and relevant committees. ICCAT's Secretariat also provides for effective engagement by stakeholders including Non-Government Organisations (NGOs) and other interested parties. Guidelines for NGO participants, including environmental, and/or industry representatives are provided in the *Guidelines and Criteria for Granting Observer Status at ICCAT Meetings* (ICCAT 2005).

Registered meeting observers are not permitted to vote, however may at the Chair's discretion make oral presentations, and circulate documents via the ICAAT Secretariat. Details of these contributions are recorded in the annual report of meetings.

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[14] For example, see https://www.prnewswire.com/news-releases/leading-environmental-ngos-stand-together-to-call-for-100-observer-coverage-on-industrial-tuna-fishing-vessels-300873686.html

[15] For example, see: https://www.birdlife.org/asia/news/training-scientists-save-seabirds, and "2019 taiwan international bird rope workshop" was held in kaohsiung on 24 april - press release - fisheries news - fisheries department of the agriculture committee of the executive council (fa.gov.tw)

As for some other Tuna RFMO processes, there are some meeting sessions, often compliance or MCS related, that may be held in closed sessions and are not fully transparent or accessible to all stakeholders for security and/or confidentiality purposes. Documentation regarding formal consultative processes for Taiwan with respect to stakeholder consultation and engagement, particularly in the leadup to ICCAT's annual meeting is not easily accessible. However, SCS (2018) in their MSC assessment of the Taiwanese FCF Purse Seine Fishery note anecdotal explanations and evidence of consultation associated with other T-RFMO meetings. These suggest Taiwan has well established consultation arrangements prior to key T-RFMO meetings that provide opportunity for at least some of the interested and affected parties to the UoA fishery.

For example, when conservation and management measures are proposed (Resolutions and Recommendations in the ICCAT context), TFA and the Overseas Fishery Department of Council (OFDC) summarize existing CMMs, any related meeting reports published on WCPFC website about the change of CMMs and new proposed CMMs. This occurs one month before the annual T-RFMO meetings. TFA and OFDC actively consult with related parties, such as their national Longline Association to develop an agreed position on proposals, that can serve as a national position to be addressed by TFA and OFDC at the relevant meeting.

After the meeting, the TFA under the Council of Agriculture, Executive Yuan (central government) and the overseas Fisheries Development Council will propose the adoption of management measures into Taiwan's domestic regulations. After passing the regulation, the Council of Agriculture, under Executive Yuan, will be assigned to establish the policy and procedures associated with the regulation.

When new regulations are proposed, the SCS assessment team was advised that domestic law obliges the TFA to provide a pre-notice, for a period of 3-4 weeks, for the public to provide input on changes in legislation, which are then considered by the agency. There is no obligation on the part of the agency to provide explanation of what is, or is not decided, or why (SCS, 2018).

Disputes

Similar to the other regional fisheries management organisations, ICCAT relies on consensus-based decision making, including dispute resolution through less formal discussion and negotiation processes between parties. In more serious cases, the Convention allows for Contracting Parties to withdraw from endorsement and implementation of a formal recommendation. Control Union (2020) notes that this occurs infrequently (12 times since 1969).

ICAAT's Working Group on Convention Amendment (WGCA) has been discussing and developing more formal dispute resolution procedures for some years now. A report from the 2018 WGCA meeting noting some progress despite some more significant points of continued debate (e.g. whether dispute settlement procedures should be compulsory, whether procedures could only be instituted jointly by all parties, or by a single or group of disputing parties (ICCAT 2018).

4.4.1.6 Non-fishery Uses or Activities and Arrangements for Liaison and Coordination

To be advised following initial site visit.

4.4.1.7 Compliance and Enforcement

For the UoA fishery, the need for an effective Monitoring Control and Surveillance (MCS) framework exists at both the regional (ICCAT), and national (Flag State) levels. Whilst ICCAT and its CPC's develop and implement overarching management and MCS arrangements, there are very few sanctions available via the ICCAT processes. The management of IUU fishing risks within ICCAT's area of operation largely rests with Flag States, although there are key elements of IUU management (e.g., Port State Measures) that fall within ICCAT's overarching MCS framework. These are covered in more detail below.

ICCAT

The ICCAT MCS framework and processes give effect to a broad range of monitoring, control and surveillance (MCS) obligations and requirements, and these are managed via the Conservation and Management Measures Compliance Committee (COC). Members' annual reports to the COC are made publicly available on ICCAT's website along with the annual meeting papers and reports, and include:

- Annual fisheries information;
- Research and fishery statistics;
- Compliance with reporting requirements under ICCAT conservation and management measures;
- Implementation status of ICCAT Resolutions and Recommendations and other key management measures; and
- Details about any significant implementation difficulties for ICCAT conservation and management measures.

Several independent external reviews of ICCAT's management and MCS performance (ICCAT 2009, 2017) have identified shortcomings, and areas for improvement in the Commissions implementation of MCS measures to support longer term and fishery specific management objectives. These reviews have also been augmented by other stakeholder led reviews. Particularly in relation to ICCAT's capability to monitor and enforce compliance with its own management and conservation measures.

In general, these recommendations and critiques have helped ICCAT and CPC's to significantly refine the Commission's MCS approach over time. The system now includes coordinated inspection and data entry and validation systems that allow near real-time and at least daily updates at all levels. Catch certification or catch document schemes encouraged in the FAO's International Plan of Action on IUU Fishing have also been fully implemented for this fishery through ICCAT's Bluefin Tuna Statistical Document Programme (e-BCD).

The FAO Agreement on Port State Measures to Prevent, Deter and Eliminate, Illegal, Unreported and Unregulated Fishing (PSMA) is a binding international agreement designed to reduce the risks of IUU fishing (FAO 2009). ICCAT has included Port State Measures (PSM) requirements into its MCS arrangements; including obligations for prior notification of port entry, designated ports, restrictions on entry and landing/transshipment of fish, restrictions on supplies and services, documentation requirements and port inspections, as well as IUU vessel listing, and trade-related measures and sanctions.

Taiwan

As part of the redevelopment of its national fisheries laws and policies following the imposition of European Union Yellow Card actions, Taiwan has significantly tightened its overarching MCS approach, including operational procedures, compliance activity, and available sanctions for distant water fishing vessels. The information below draws on and adds to information sourced from a recent SCS Global MSC assessment report for Taiwan's FCF Fishing Company (SCS, 2018), as well as more recent discussions with Taiwan's Fisheries Agency officials as part of the virtual onsite audit for a similar Taiwanese Albacore Fishery UoA.

Taiwan's revised Distant Water Fisheries Act lists 19 activities as "major violations," including: undertaking distant fishing without registration; failing to install a VMS and a system to report each vessel's catch; unloading and transshipping fish and fishing in foreign waters without official approval; counterfeiting and hiding identification markers, such as the name and number of a fishing boat; fishing in excess of the authority's announced quotas; fishing, possessing, transshipping, unloading or selling banned species; avoiding or obstructing inspection, and cooperating with boats that have been undertaking illegal, unreported and unregulated (IUU) fishing. Chapter IV of the new Distant Water Fisheries Act provides extensive Penal Provisions in Articles 35 to 45.

These provisions provide for escalating fines and/or suspension and cancellation of concessions where there are multiple and repeat offenses over time. The Act stipulates that business operators or employees who perpetrate any of the major violations will be severely fined and their fishing permits will be revoked for up to two years. The enforcement rules impose fines that are categorized in proportion to the size of the boat in question and the number of times in recent years the offence has been detected. If the fines are "*less than the value of seized fishery products, the perpetrator would instead be fined up to five times of the value of the seized products.*" The act also stipulates that repeated violations are subject to more severe punishment. As this Act is relatively recent there is limited evidence to know if sanctions are an effective deterrent.

In addition to the revised Distant Water Fisheries Act, amendments to the Ordinance to Govern Investment in the Operation of Foreign Flag Fishing Vessels prohibit Taiwan from investing in or operating boats that are non-Taiwanese without official permission. If investments are planned for boats that are known to have undertaken IUU fishing, the permission would not be granted, or, if already granted, would be revoked, according to the amendment.

As described above, both TFA and the Coast Guard Administration have the power to detect, identify, and issue punishments for infringements. TFA also provides for an annual exchange of information between the Taiwanese Coast Guard Administration and the Fisheries Agency regarding international fisheries management. Both the Coast Guard and the Fisheries Agency can conduct boarding and inspection of vessels, but it is unclear what coordination is legally required between the two institutions. The Maritime and Port Bureau in the Ministry of Transportation and Communication also wields legal authority to inspect Taiwanese flagged vessels in order to deter IUU fishing (SCS, 2018). For vessel monitoring and inspections for the UoA vessels, there are currently 7 fisheries inspectors stationed overseas, and 1 of them is stationed semi permanently in Cape Town to inspect Atlantic fishing vessels. Other designated ports are Port of Spain, Montevideo, and Port of Stanley. For these ports, inspections are conducted by an independent third party in accordance with the procedures established by the TFA. There are also 18 Taiwan based inspectors and some of these may be deployed to overseas ports where the volume of landings requires this. TFA have advised, in part due to Covid restrictions, these deployments of inspection staff have been infrequent recently (TFA pers. Comm.).

Table 29: Taiwanese Atlantic longline ports and landing events for 2019, 2020.

Fishing Region	Designated Ports	Number of landings 2019	Number of landings 2020	Number of landings 2021
North Atlantic	Port of Spain, Trinidad and Tobago			
South Atlantic	Montevideo, Uruguay			
	Cape Town, South Africa			
	Dakar, Senegal	?	?	

TFA has also recently increased its MCS capability through operation of a recently established National Fisheries Monitoring Centre. In addition to monitoring DWFV operations via daily and four-hourly electronic catch reporting, the integrated FMC also has the capability to respond to potential MCS breaches in near real time. TFA recently provided details of an incident response involving a purse seine vessel (FB NO.707) that was not transmitting VMS locational data during a period of a FAD closure in the WCPO. This initiated a monitoring response whereby the FMC followed up promptly with both the vessel owner and fishing master, and investigated the circumstances of the incident. It was discovered that the vessel had been fishing during this period and was in contravention of Taiwan's domestic regulations implemented to give effect to RFMO requirements. The vessel was subsequently prosecuted and a fine issued by TFA in 2020 (TFA pers. Comm.).

In another example, a news article in Focus Taiwan on 15 August 2017 (also reported in FIS World news 16 August 2017), reported that the Government had imposed fines in 109 cases of illegal fishing involving Taiwan deep-sea fishing vessels from January to July 2017. The article notes this renewed focus on MCS is an effort to ensure the European Union removes Taiwan from a watch list of countries that have not taken sufficient action to curb IUU fishing. Most of these penalties were made under the amended Fisheries Act , however 24 were fines based on the new Distant Water Fisheries Act, which came into force on 20 January 2017. Taiwanese vessels undertake daily electronic logbook reporting and must unload or transship catch at designated domestic or international ports where monitoring capability exists. VMS polling for DWFV's occurs hourly (TFA – pers comm, 2021).

Previously, the highest fine available under the Fisheries Act was NT$300,000, but today the highest fine under the amended laws governing long-range fishing is NT$4.5 million. TFA is clearly enforcing these laws, with Taiwanese fishing boat owners recently fined a total of NT$58.75 million for 71 violations—including the filing of false electronic reports about bigeye tuna hauls, unloading at ports without permission, and having illegible hull markings.[16] TFA have also advised that there is now an up-to-date Distant Water Fisheries Sanction List which is available on the Fishery Agency website, including an English language version via site translation[21]. This provides details of vessels, owners, infringements and the resultant prosecution result and/or sanctions imposed.

[16] See: https://nspp.mofa.gov.tw/nsppe/print.php?post=133905&unit=410

4.4.2 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	No
Rationale				

At a regional and national level, the ICCAT Convention, and national fisheries laws for Taiwan are consistent with the provisions of UNCLOS and UNFSA. ICCAT members are also bound to apply the precautionary approach as parties to the Convention.

UNCLOS makes specific provisions for straddling stocks and highly migratory fish stock in Articles 63 and 64 and requires that "... States ...cooperate directly or through appropriate international organizations with a view to ensuring conservation and promoting the objective of optimal utilization ..." of the stocks. This is reinforced in Articles 118 and 119 where States are required to cooperate in the conservation and management of high seas stocks. Article 119 further develops the need for catch limits, the use of the best available scientific evidence, the need to rebuild overfished stocks and to manage fishing impacts on non-target stocks.

The UNSFA, operating as an implementing Agreement, seeks to elaborate on roles and responsibilities and requirements of UNCLOS with respect to managing straddling stocks and highly migratory fish stocks. Article 8 reinforces the need for States to cooperate to ensure the objective of the Agreement "to ensure the long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks through effective implementation of the relevant provisions of the Convention" is achieved.

The ICCAT Convention draws on all the key provisions of the UNFSA. It is also designed to reflect the regional political, socio-economic, geographical and environmental characteristics for its area of competency, including waters of the UoA fishery. The management measures, principally ICCAT's Resolutions and Recommendations, designed to deliver outcomes consistent with MSC Principles 1 and 2.

Taiwan
Taiwan's Fisheries Act (2016) and Distant Water Fisheries Act (2016) provide a contemporary framework of sustainable fisheries legislation consistent with the requirements of the UNFSA and aligned with MSC Principles

1 and 2. These primary Acts are administered by the Taiwan Fisheries Agency (Council of Agriculture of the Executive Yuan). The Agency also has a Deep Sea Fisheries Division which is responsible for managing all aspects of fishing operations, including issuing licenses, monitoring VMS, port inspections, recording data, monitoring quota or harvest limits, placement of observers, transhipment, enforcement (with the Coast Guard), prosecutions etc. For this assessment, the Distant Water Fisheries (DWF) Act (2016) is most relevant, with a focus on management and enforcement of Taiwan vessels fishing on the high seas or a third country's EEZ to promote the sustainable operation of distant water fisheries. It has objectives to: ▪ Ensure the conservation of marine fisheries resources; ▪ Strengthen distant water fisheries management; ▪ Curb IUU fishing; and ▪ Improve traceability of catches and fisheries product. Article 5 of the DWF Act requires that the TFA develop arrangements which have regard to the precautionary principle, ecosystem based approach and the use of the best available scientific advice with the aim to deliver management outcomes consistent with MSC Principles 1 and 2 and specifically requires "Cooperation with other countries and international fisheries organizations." In recent years, the TFA has demonstrated (particularly via its response to the EU yellow card[17] process) that it is open to scrutiny, review and adaptation. However, there is also evidence that Taiwan generally coordinates with other T-RFMO parties to contribute scientific data from their fisheries for collective use by RFMO's including ICCAT. As part of the EU yellow card process TFA has also acknowledged that they haven't historically been able to design/resources systems to fully control their DWF vessels, and that they have therefore recently set up an auditing program that will undertake port inspections in major transhipment hubs used by Taiwan vessels, under the new DWFA. In conclusion, SG 60 and SG 80 requirements are met by all parties involved in management. SG100 is not met because binding arrangements are not in place across all jurisdictions.				
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	No

[17] Refers to the EU's implementation of its IUU regulation as regards third countries. For more information, see https://ec.europa.eu/fisheries/cfp/illegal_fishing/info_en. An up-to-date list of third country status may be found here: https://ec.europa.eu/fisheries/sites/fisheries/files/illegal-fishing-overview-of-existing-procedures-third-countries_en.pdf.

Rationale				
For this UoA there are two management systems where disputes may need to be resolved – at the regional level through ICCAT and through the relevant national and/or flag state management system. Nationally, disputes are most likely to revolve around non-compliance or dissent around national laws and policies and be resolved domestically. Therefore, the regional management system is evaluated for this scoring issue. ICCAT relies on consensus-based decision making, including dispute resolution through less formal discussion and negotiation processes between parties. In more serious cases, the Convention allows for Contracting Parties to withdraw from endorsement and implementation of a formal recommendation. Control Union (2020) note that this occurs infrequently. ICAAT's Working Group on Convention Amendment (WGCA) has been discussing and developing more formal dispute resolution procedures for some years now, a report from the 2018 WGCA meeting noting some progress despite some more significant points of continued debate (e.g. whether dispute settlement procedures should be compulsory, whether procedures could only be instituted jointly by all parties, or by a single or group of disputing parties (ICCAT 2018). The UNFSA also includes a dispute settlement mechanism and all parties to the UoA are signatories to this agreement. It prescribes peaceful settlement of all disputes (Article 31) however there is no readily available evidence as to whether these arrangements have been recently tested. ICCAT's dispute resolution mechanism meets SG60 and SG80 requirements, however SG100 is not met because there is no readily available evidence that these dispute resolution procedures have been tested and found to be effective.				
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	No
Rationale				
In relation to the UoAs, the primary management system where legal rights are created explicitly or established by custom for people dependent on fishing for food or livelihood is the overarching ICCAT management framework. ICCAT's Resolution 15-13 details future Criteria for the Allocation of Fishing Possibilities, and explicitly recognises the needs and rights of coastal states and small island developing states. Criteria 8 notes the interests of artisanal, subsistence and small-scale coastal fishers; the needs of the coastal fishing communities which are dependent mainly on fishing for the stocks; the needs of the coastal States of the region whose economies are overwhelmingly dependent on the exploitation of living marine resources, and socio-economic contribution of ICCAT managed fish stocks to developing States, especially small island developing States and developing territories.				

ICCAT has formally committed to legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood consistent with the objectives of MSC Principles 1 and 2. Therefore the management system meets the requirement for SG 60, and SG 80. SG 100 is not met as ICCAT has not yet allocated formal fishing rights for all parties for key species.	
References	
UNCLOS; UNFSA; ICCAT Convention; Taiwan Fisheries Act 2016; Taiwan Distant Water Fisheries Act 2016; SCS 2018; Medley et al. 2021.	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.1.2 – Consultation, roles and responsibilities

<table>
<tr><td colspan="2">PI 3.1.2</td><td colspan="3">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</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Roles and responsibilities</td></tr>
<tr><td>Guide post</td><td>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.</td><td>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.</td><td>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.</td></tr>
<tr><td>Met?</td><td>Yes</td><td>Yes</td><td>No</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">At the regional (ICCAT) level, Medley et al. (2021) noted "The performance of the Secretariat is sound and well regarded as both efficient and effective by CPCs. The CPCs themselves vary in their ability to perform their role, but the roles and responsibilities are nevertheless explicitly defined at least at the national level for key areas". They also note that "although roles within ICCAT and among its CPCs are well defined, these are not necessarily well understood by entities within nations," and that these should be evaluated on a fishery specific basis. This suggests that most of the issues relating to ICCAT CPC's understanding and observance of their roles and responsibilities for key areas of management responsibility and interaction rest largely with the CPC's themselves, rather than ICCAT processes.

Taiwan

At the Flag State level, functions, roles and responsibilities are defined by legislation and via subordinate policy and processes. The level of understanding and commitment to these processes at the individual company/vessel level varies across States, relying on both the clarity of legislation and policy as well as the level of engagement between government agencies and fishing industry representatives.

For the UoA Fishery, Taiwan's Fisheries Agency (TFA) has recently updated their national fisheries legislation, including that used to manage distant water vessels. Under this framework Roles and responsibilities are generally well defined and contemporary in scope; and well understood. This is supported by compliance summary tables provided in the most recent ICCAT Annual Report for 2020-2021, noting that there have been no compliance issues recorded and that no compliance action is required for Taiwan the two-year reporting period in question. The compliance summary report does identify several other CPC's outside the UoA that appear to be non-compliant on some reporting and data requirements.

Taiwan has well established arrangements that involve industry associations and individual stakeholders directly in the leadup to annual RFMO meetings and the development of new management regulations. These are built into government processes, with the Taiwan Fishery Agencies Deep Sea Fisheries Division responsible for managing all aspects of fishing operations as they relate to distant water fishing, including issuing licenses, monitoring VMS, port inspections, recording data, monitoring quota or harvest limits, placement of observers,</td></tr>
</table>

management of DWFV transhipment, enforcement (in association with Taiwan's Coast Guard), and support with compliance investigations and where necessary prosecutions and sanctions. There is recent evidence from SCS surveillance audits for other MSC tuna fishery assessments that key areas of responsibility and interaction are explicitly defined and well understood, with stakeholder interests actively considered during domestic processes. At the Flag State level, functions, roles and responsibilities, and the personnel and processes to undertake these are clearly identified and well defined for key areas of responsibility and interaction but not all areas. Therefore SG 60 and SG 80 are met. At the regional level (ICCAT), organisations and individuals involved in the management process have been identified; and functions, roles and responsibilities are explicitly defined and generally well understood for key areas of responsibility and interaction, also meeting SG60 and SG80.				
b	Consultation processes			
	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	No
Rationale				
The ICCAT formal annual meeting serves as the key regional fisheries management consultation and decision-making process for the UoA fishery. There is a strong national consultative element to this, particularly for ICCAT CPC's in the leadup to key meetings. In addition, the range of ICCAT subsidiary panels and working groups are designed to collect and analyse relevant stakeholder information in their development of fisheries management based Resolutions and Recommendations for consideration by the plenary session of the annual meeting. These processes seek and accept information and demonstrate consideration of the information. Scientific reports state what information is being used, how it is used, and justification is usually provided where information is not demonstrably included in decision making. Despite this, and similar to the processes used for other T-RFMO's, information used by management for other decision-making purposes, such as some MCS related information, or more sensitive commercial information, may not be as transparent, or as clearly reported. **Taiwan** For Taiwan, SCS (2018) provide detailed information about the consultation processes used in the leadup to international T-RFMO meetings (WCPFC in this case with the same approach used for other RFMO processes). More recent SCS MSC Audit processes (November 2020) have also corroborated this consultation approach, including the involvement of affected parties. For example, TFA and the Overseas Fishery Department of Council (OFDC) engage actively with interested parties such as the Taiwan Tuna Association, and Longline Association to discuss and gather all opinions in order to attempt to achieve a common stance on proposed RFMO management measures. After the meeting, and in order to adopt the measures into domestic regulations, the Deep-Sea division of TFA will propose the adoption of the measures into domestic legislation. After passing the regulation, the Council of Agriculture, under Executive Yuan, will be assigned to establish the domestic fisheries management policy and procedures associated with the regulation. When new regulations				

are proposed, the TFA provide a pre-notice, for a period of 3-4 weeks, for the public to provide input on changes in legislation, which are then considered by the agency. At both the regional (ICCAT) and national level for Taiwan, there is evidence of formal stakeholder consultation processes that seek and accept relevant information, and demonstrate consideration of the information obtained, thus meeting the SG 80 level.				
c	Participation			
	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	No
Rationale				
This Scoring Issue considers whether appropriate consultation processes are in place to ensure interested parties can participate in decision making. The primary level of decision-making is at the regional level, via ICCAT processes. However, individual flag States also need to provide for stakeholder involvement in developing national positions for RFMO participation, as well as giving domestic effect to any relevant ICCAT Resolutions and Recommendations. ICCAT has a generally inclusive approach to stakeholder participation and related decision-making processes, with the annual meeting process enabling Members, Participating Territories and Cooperating Non-members; as well as both intergovernmental and non-government observers (by prior arrangement) to participate. There are some subsidiary committees and meetings where information is more sensitive, or confidential, and stakeholder participation is more limited. Development and agreement of final Resolutions and Recommendations is undertaken in plenary session where participation is more open, and a more diverse range of stakeholders able to participate. Under ICCAT Recommendation 14-13, the SWGSM is intended to facilitate better participation and understanding between fisheries managers and scientists, to improve the efficiency and effectiveness of management strategies. **Taiwan** For Taiwan, SCS (2018) provides a detailed example of the processes used by TFA to seek stakeholder participation and advice in the leadup to regional fisheries meetings, including the annual ICCAT processes. Examples of the consultative arrangements undertaken in developing Taiwan's new Distant Water Fisheries Act are also provided. Under Taiwan's domestic administrative procedures for developing and enacting new legislation and regulations, there are established processes to consider stakeholder comments on amendments to laws and regulations implementing newly agreed T-RFMO management responsibilities, including ICCAT Resolutions and Recommendations for the UoA Fishery. When new domestic management regulations are proposed to give effect to ICCAT management obligations, domestic law obliges the TFA to provide a pre-notice, for a period of 3-4 weeks, for the public to provide input on changes in legislation, which are then considered by the agency. For example, consultation on Taiwan's new Distant Water Fisheries Act received diverse stakeholder input, including members of industry, representatives of academic institutions, and e-NGO representatives.				

This information and broader assessment team experience from similar T-RFMO processes indicate that Taiwan has established consultation arrangements to enable stakeholder participation in T-RFMO processes, that provide appropriate opportunities for interested and affected parties to be consulted. There is sufficient evidence to conclude that relevant stakeholder groups have the opportunity and are encouraged to participate in consultation processes relevant to the UoA (ICCAT, BCC, Taiwan). Formal arrangements are in place in all jurisdictions to facilitate this participation and engagement. SG 80 level is met for all UoA countries.
References
ICCAT Convention; ICCAT Compendium of Resolutions; Taiwan Fisheries Act 2016; Taiwan Distant Water Fisheries Act 2016; SCS; Medley et al. 2021.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.1.3 – Long term objectives

<table>
<tr><td colspan="2">PI 3.1.3</td><td colspan="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</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Objectives</td></tr>
<tr><td>Guide post</td><td>Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are implicit within management policy.</td><td>Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are explicit within management policy.</td><td>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.</td></tr>
<tr><td>Met?</td><td>Yes</td><td>Yes</td><td>No</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">The focus of this scoring issue is on the status of long-term objectives at the RFMO (ICCAT) level, as described by MSC's GSA. As signatories to the UNFSA, Taiwan is also required to adopt longer term sustainability objectives, as well as a precautionary approach to fisheries management decision making.

ICCAT has key fisheries management objectives that align with both the UN Fish Stocks Agreement, and FAO's Code of Conduct for Responsible Fisheries. ICAAT's principal objective, set out in Article VIII of the ICCAT Convention, is to "maintain the populations of tuna and tuna-like fishes that may be taken in the Convention area at levels which will permit the maximum sustainable catch". In making decisions pursuant to this primary objective, ICCAT is also required to:

• Apply an ecosystem-based approach to fisheries management (Resolution 15-11 refers); and
• Use a precautionary approach in implementing ICCAT conservation and management measures (Resolution 15-12 refers).

Information from the most recently available outcomes of ICCAT's external performance reviews (ICCAT 2016) noted that a precautionary approach had not been applied consistently across ICCAT managed stocks. For example, earlier stock assessments in 2010, 2011 and 2014 indicated that bigeye fishing mortality exceeded levels consistent with MSY. Clear precautionary action to sufficiently reduce exploitation levels was not evident at that time. Most recently fishing effort on Mediterranean Swordfish stocks, Atlantic Bigeye, and Atlantic Yellowfin Tuna has been above levels needed to recover these stocks and/or prevent overfishing. For longline fleets, observer coverage remains inadequate to characterise broader impacts and risks of fishing operations more accurately, particularly for bycatch species.

Overall, clear explicit objectives incorporating the precautionary approach and ecosystem-based management consistent with MSC Sustainability Principles and Criteria, are evident across all key jurisdictions. This meets SG 60, and SG 80. In principle some aspects of SG100 are also met. However, in practice there are elements of the management system where the precautionary approach is not applied diligently across all levels of legislation and policy relevant to the UoA.</td></tr>
<tr><td colspan="5">References</td></tr>
<tr><td colspan="5">UNFSA, UNCLOS; ICCAT Convention; ICCAT Compendium of Resolutions; Taiwan Fisheries Act 2016; Taiwan Distant Water Fisheries Act 2016; SCS 2018; Pew 2019; WWF 2007; Medley et al. 2021.</td></tr>
</table>

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
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	No
Rationale				

For the UoA, ICCAT has overarching responsibility for sustainability and management of target stocks and for minimizing the impact of the fishery on ecosystem components. Hence the focus for evaluation against this PI are ICCAT's fishery specific arrangements, particularly the suite of CPC Resolutions and Recommendations that together make up the primary fisheries management framework for the UoA vessels operating within ICCAT's area of competence.

There are a large number of Resolutions and Recommendations that relate directly to P1 and P2 outcomes, developed with a foundation of scientific advice from ICCAT's SCRS and related species-specific Advisory Panels. For example Recommendation 19-02 on a multi-annual conservation and management plan for tropical tunas; and ICCAT's objective for the management of Atlantic Albacore with the objective of maintaining high long-term catches with a high probability of stocks not being overfished nor overfishing occurring, and a high probability of not being outside biological limits.

Other more specific objectives for ICCAT's management of Albacore within the UoA fishery include Recommendation 16-06 on a Multi-annual Conservation and Management Program for North Atlantic Albacore; Recommendation 16-07 on Southern Albacore Catch Limits for the Period 2017 to 2020; and Recommendation 17-04 on a Harvest Control Rule for the North Atlantic Albacore Supplementing the Multiannual Conservation and Management Programme (Rec. 16-06).

For broader environmental management, Article IV (1) of ICCAT's Convention text has been amended to establish ICCAT's ecosystem approach to fisheries (EAF) (for example Res. 15-11 in terms of bycatch or predator-prey relationships). The 2nd ICCAT Performance Review (ICCAT 2016) also recommended more targeted measures to address bycatch of seabirds and turtles.

ICCAT's short and longer-term objectives are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2. The emphasis of objectives in ICCAT's fishery specific objectives expressed via a suite of Recommendations and Resolutions is on ecological versus direct social/economic objectives, consistent with guidance in MSC GSA 4.7meeting SG 60 and SG 80 requirements.

References

ICCAT Compendium of Management Recommendations and Resolutions. Medley et al. 2021; UNFSA, UNCLOS; ICCAT Convention; Taiwan Fisheries Act 2016; Taiwan Distant Water Fisheries Act 2016; SCS 2018; ICCAT 2009; ICCAT 2017.	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

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 regional level through ICCAT, decision-making processes are generally open, are intended to apply the precautionary approach (e.g., UNFSA and ICCAT obligations); use the best available information and are well documented. Consensus is the general rule for decision-making by Commission Members during the annual meetings. ICCAT make use of a series of expertise-based species-specific Panels to guide development and review of management recommendations, and inform subsequent decision making by the Commission members. This provides an additional layer of discussion and refinement of decision-making where needed. Specific areas may also be addressed through expertise based ICCAT Working Groups (e.g. Working Group on FADs) that cooperatively develop Recommendations for consideration and approval at the Plenary Session of Commission meetings. As for other T-RFMO's, ICCAT decision making integrates scientific advice from members and various research programmes, as well as the suite of fisheries related data provided by members and cooperating non-members. This includes data sourced from VMS, logbooks, independent fishery observers, and stock assessment results and advice. ICCAT adopted its 2015-2020 Science Strategic Plan (SSP) for the functioning and orientation of the SCRS in 2014. The plan sets out a Mission, a Vision, Goals, Objectives, and Strategies to achieve each goal as well as measurable targets. It also facilitates improved decision making by encouraging closer engagement between the SCRS and Working Groups, the Commission, and stakeholders. ICCAT's website has also been recently refined, now providing a comprehensive and accessible resource for ICCAT's documents and reports. Development of management measures, primarily Resolutions and Recommendations, by ICCAT is a well-established process; as are those processes related to data collection and review, and stock assessment outcomes that feed directly into decision making to support longer term and fishery specific objectives. Both SG 60 and SG 80 are met.				
b	Responsiveness of decision-making processes			
	Guide post	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation,	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and	Decision-making processes respond to all 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.	consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Yes	Yes	No

Rationale
As outlined above, ICCAT's decision-making processes allow consideration of serious and important issues through inter-sessional scientific, management and MCS focussed Panels and Working Groups; and annually at the Commission meeting. Deliberations and advice/decisions from these working groups and the Commission are relatively transparent with the rationales explained in working group reports tabled to the annual meeting; and captured in Plenary sessions and subsequent ICCAT annual meeting reports. Specific details about timeliness of decision-making are less obvious. The second Independent Performance Review of ICCAT (ICCAT 2016) found the Commission's consensus based decision-making process did not always enable timely adoption of conservation and management measures, particularly as the number of participating CPC's increased significantly. There remain however recent examples where ICCAT's decision making processes for more serious and important fisheries management priorities have been less consistent, timely and adaptive. For example, ICCAT and its members continue to face challenges with respect to the implementation of effective management strategies for preventing overfishing, and to rebuild key stocks, including for Atlantic Bigeye and Yellowfin Tuna, Swordfish, and Marlins. Slow progress toward catch allocations and scientifically based catch limits, as well as the development of species-specific harvest strategies are also relevant examples. On a more positive note, more recent ICCAT conservation and management measures to rebuild depleted stocks of Atlantic Bluefin Tuna were implemented in a more timely and effective manner than previously, enabling greater stock recovery progress than anticipated. **Taiwan** The situation for Taiwan in relation to transparent, timely, and adaptive domestic management response and decision-making arrangements for more serious management and/or compliance issues has generally been less clear. However more recent MSC surveillance audits (SCS, 2018) suggest more recent improvements in this regard. In addition, Taiwan's national response to the European Union's Yellow Card process, including a largescale revision and redevelopment of its entire national fisheries legal and policy framework; and the introduction of more stringent MCS processes, and centralised daily electronic logbook reporting for longline vessels, demonstrate the ability to respond relatively quickly and effectively to more serious management issues. TFA's responses to more serious and important issues can be initiated at any time, rather than just in the lead up to the annual ICCAT or other T-RFMO processes. For example, TFA have responded rapidly to industry requests to provide access to new transhipment ports for purse seine transhipment activities, and subsequent approvals processes. As part of broader reforms to Taiwan's National fisheries management and regulatory framework, TFA's recently developed E-platform for public participation[18] provides an online mechanism for the public and civil society organisations to raise serious and important policy issues that must be responded to by the relevant

[18] Available at (https://www.ndc.gov.tw/en/Content_List.aspx?n=C3C5AABC54ECEA0D.

authority. Although fishery specific examples are not readily apparent, TFA assurances (supported by documentation) were provided that fisheries related proposals would be addressed under these national policy and regulatory requirements. At all management levels of the UOA (ICCAT, and Taiwan nationally) there are established and generally effective frameworks for decision-making that are able to respond to serious and other important issues in a transparent manner. Despite this, for ICCAT there is also recent evidence that not all important management issues are addressed in a transparent, timely and adaptive manner. SG60 and SG80 are met, whilst SG100 is not.				
c	Use of precautionary approach			
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Yes	
Rationale				
Assessment of this Scoring Issue is primarily related to the processes and management decisions taken at the fishery specific management level; therefore, the focus is ICCAT as the RFMO responsible for fishery management measures affecting the UoA fishery. The role of the Flag States for this assessment (Taiwan) is essentially to ensure that ICCAT and other agreed regional Resolutions, Recommendations, and management measures are implemented. ICCAT's Convention, pursuant to UNFSA requirements, requires that Members, Participating Territories and Cooperating Non-members directly and through the Commission, apply the precautionary approach. ICCAT also requires that decisions be based on the best scientific information available and the Commission through its annual meetings and the various specialist Panels and Working Groups, also supports this objective. The 2nd external independent review of ICCAT also noted that the Commission should make more explicit reference to the application of the Precautionary Approach in its decision making. Subsequently ICCAT Resolution 15-12 requires that "When making recommendations pursuant to Article VIII of the Convention, the Commission should apply a precautionary approach, in accordance with relevant international standards". Whilst the UNFSA, ICCAT's longer term objectives, and specifically Resolution 15-12 all require the Commission to take a precautionary approach to its management decision making, there are nonetheless some more recent examples where this approach has not been applied fully, or in all cases. This does not reflect the theoretical framework ICCAT is operating under, but rather the complexities of establishing a consensus and agreed way forward on complex multilateral fisheries management issues and negotiations for an RFMO with in excess of 50 CPC's. SG 80 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	No

Rationale

For the UoA fishery, ICCAT is responsible for an effective regional management framework, also acting as the primary fisheries management "decision making" entity on behalf of members and co-operating non-members. Papers and reports from ICCAT's plenary sessions, as well as the scientific, management and MCS processes supporting the Commissions deliberations, are also published formally, and are publicly available on the Commission's website. These provide a generally high level of transparency, demonstrating the development of Resolutions and Recommendations on conservation and management issues, and showing how stakeholder contributions including scientific and other information are used to inform these processes.

ICCAT's CPC's submit annual country reports including information on fisheries activities, research and statistics during the preceding calendar year. Member reports summarising management and compliance issues and performance are also provided; however, these may also contain more sensitive information and may not be publicly available. It is thus difficult to determine whether these reports represent all of the relevant information used to inform decision-making. There is not always a clear and detailed explanation linking the information provided to any subsequent decisions. In this international RFMO context, recognising the national interest aspects for each CPC, and the presence of commercially sensitive information, it is recognized that it can be difficult to give full explanations for all decisions. Such decisions may be negotiated outcomes with the trade-offs not always apparent.

Overall, SG 60 and SG 80 requirements are met for the ICCAT processes; however, not all information is publicly available, and information is not comprehensive for all elements of the management system or available to all interested stakeholders, therefore SG100 is not met.

e	Approach to disputes			
	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	No

Rationale

The primary management system for assessment under this Scoring Issue is the regional management process led by ICCAT. As the overarching management authority, the Commission process is collaborative, serving to develop and implement management arrangements, and monitor member compliance. Members, Participating Territories and Cooperating Non-members are party to all decisions at the annual ICCAT meetings; as well as their ongoing participation in subsidiary processes such as the specialist fisheries management Panels and Working Groups.

Disputes/disagreements are typically resolved either during the iterative development of new management arrangements (Resolutions and/or Recommendations); or for more serious issues and discussions, via negotiation at ICCAT's annual meetings. In more serious cases, the Convention allows for Contracting Parties to withdraw from endorsement and implementation of a formal recommendation. ICAAT's Working Group on Convention Amendment (WGCA) has been discussing and developing more formal dispute resolution procedures for some years now, a report from the 2018 WGCA meeting noting some progress despite some more significant points of continued debate (e.g., whether dispute settlement procedures should be compulsory, whether procedures could only be instituted jointly by all parties, or by a single or group of disputing parties. Recognising that Taiwan is also bound by the ICCAT dispute resolution processes outlined above; both ICCAT and Taiwan meet SG 60 and SG80 requirements.
References
ICCAT 2018; ICCAT Compendium of Management Recommendations and Resolutions. UNFSA, UNCLOS; ICCAT Convention; Medley and Powers 2015; Taiwan Fisheries Act 2016; Taiwan Distant Water Fisheries Act 2016; SCS 2018; Medley et al. 2021.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.3 – Compliance and enforcement

<table>
<tr><td colspan="2">PI 3.2.3</td><td colspan="3">Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">MCS implementation</td></tr>
<tr><td>Guide post</td><td>Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.</td><td>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.</td><td>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.</td></tr>
<tr><td>Met?</td><td>Yes</td><td>Yes for ICCAT, No for Taiwan nationally.</td><td>No</td></tr>
<tr><td colspan="5">Rationale</td></tr>
<tr><td colspan="5">MCS arrangements considered for this Scoring Issue have been assessed at the regional (ICCAT); and Flag State levels. Whilst ICCAT’s Convention specifies a range of MCS measures, it is up to each of the Flag States in the UoA to ensure these are operationalised and enforced through national and fleet level processes.

The ICCAT MCS framework and processes give effect to a broad range of MCS obligations and requirements, and these are managed via the Conservation and Management Measures Compliance Committee (COC). Members’ annual reports to the COC include sections on key fisheries management operations and MCS related activities. These annual member reports are made publicly available on ICCAT’s website along with the annual meeting papers and reports.

ICCAT’s MCS system has been significantly refined in recent years and now includes coordinated inspection and data entry and validation systems that allow near real-time and at least daily updates at all levels. In addition, catch certification schemes have been implemented for this fishery through ICCAT's Bluefin Tuna Statistical Document Programme (e-BCD). ICCAT has also included Port State Measures (PSM) requirements; including obligations for prior notification of port entry, designated ports, restrictions on entry and landing/transhipment of fish, restrictions on supplies and services, documentation requirements and port inspections, as well as IUU vessel listing, and trade-related measures and sanctions.

In part these refinements reflect recommendations from ICCAT’s 2nd external performance review, which noted that ICCAT’s arrangements and mechanisms for effective at-sea monitoring of fishing operations for most stocks were inadequate, and that a more contemporary high seas boarding, and inspection regime was required. The review also recommended ICCAT focus more on compliance with substantive fisheries regulations and less on minor data deficiencies and minor infringements in relation to data submission.

Taiwan

Based on the information available, Taiwan’s relatively recent domestic fisheries law and related policies in relation to domestic MCS capability appear comprehensive and contemporary. However, some aspects are less clearly described or there is limited evidence available evidence to judge their effectiveness. Taiwan has a Distant Water Fisheries Sanction Issued List which is now available on their Fishery Agency website in an English language version. Previous MSC fishery assessments for Taiwanese flagged vessels undertaken by SCS Global</td></tr>
</table>

(SCS, 2018; SCS, 2019) have provided details of MCS capabilities, including a range of offences that have been successfully investigated with some receiving considerable penalties. As an ICCAT CPC, Taiwan also has authorised inspection vessels listed on the High Seas Boarding and Inspection Register, thus enabling high seas inspections under the relevant Resolutions/Recommendations. For the UoA vessels, there are arrangements in place to conduct vessel inspections of unloading both domestically and in designated foreign ports (Port of Spain, Montevideo, and Cape Town). The majority of foreign port landings occurred in Cape Town in both 2019 and 2020, and there is a permanent TFA fisheries officer stationed there to conduct vessel inspections.

Despite the measures described above, there is limited information on which to assess the effectiveness of MCS processes (e.g., vessel landing inspections, in port risk-based compliance checks) for key landing ports for the UoA, including Dakar port in Senegal. Whilst Cape Town in South Africa is an important landing port for Southern Atlantic vessels, and there is usually a TFA port inspector based there, there is a lack of evidence supporting a conclusion that MCS processes are effective in these landing ports. MCS risks associated with this lack of inspection capability are compounded when considered alongside the low levels of at sea observer coverage for UoA vessels.

There is evidence that relevant jurisdictions have monitoring, control and surveillance systems in place and have demonstrated an ability to enforce relevant management measures, strategies and/or rules. SG60 and SG80 levels are met for the management system for ICCAT. For Taiwan nationally, while a generally comprehensive MCS system exists, and MCS measures are implemented in the fishery and there is a reasonable expectation that they are effective, the shortcomings in inspection capability and activity in some key ports do not indicate, with a reasonably high level of confidence, an ability to enforce relevant management measures, strategies and/or rules. Therefore, SG80 for 3.2.3a is not yet met for Taiwan. Neither ICCAT nor Taiwan nationally meet SG100 because MCS measures are not comprehensive and have not consistently demonstrated their effectiveness across the full range of management obligations.

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	No

Rationale

The primary focus for this Scoring Issue is the national level arrangements for the UoA Flag State of Taiwan. Whilst ICCAT develops and implements management and MCS arrangements, it has few if any, sanctions available to it should flag States or vessels/companies fail to abide by management measures. ICCAT does provide some reporting on compliance performance however the focus for this PI is on Flag State measures and performance.

Taiwan

Chapter IV of Taiwan’s Distant Water Fisheries Act provides extensive Penal Provisions in Articles 35 to 45. These provisions provide for escalating fines and/or suspension and cancellation of concessions where there are multiple and repeat offenses over a period of time. As this Act has been in operation only since 2017 there is limited evidence to know if the sanctions are being consistently applied and are an effective deterrent. Separate MSC assessment reports prepared by SCS Global (e.g., SCS, 2018) note fines in 109 cases of illegal fishing involving Taiwan’s DWFV’s from January to July 2017. Most of the penalties were under the amended Fisheries Act, however 24 were fines based on the new Distant Water Fisheries Act, which came into force on 20 January 2017.

Sanctions available to Taiwan via Articles 35 to 45 suggest that it is highly likely, if they are applied consistently (similar consequences for similar offences) and at sufficiently punitive level, that they will provide an effective deterrence. Although the new Taiwanese Fisheries Act has operated for a limited time period, and there are limited details available on prosecutions, SG60 requirements are met for all parties. It is also likely that more recent sanctions imposed under Taiwan's new fisheries laws are having a deterrent effect. Therefore SG 80 requirements are also met by all parties. SG 100 is not yet met as there is a lack of evidence to demonstrate consistently effective deterrence.				
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	No
Rationale				

In relation to the UoA and for this Scoring Issue, the appropriate management system is that of ICCAT, and the range of regional fisheries MCS arrangements implemented under the Convention. Individual flag States play an important role in ensuring arrangements are complied with at the individual fisher level and from an overall flag State performance perspective, however the overall efficiency and effectiveness of management arrangements rests with ICCAT.

ICCAT members, including Taiwan in this UoA, are bound to abide by the Convention's Resolutions and Recommendations, and any non-compliance with these arrangements is reported in National Country Reports annually for consideration by ICCAT's compliance committee, the Conservation and Management Measures Compliance Committee (COC). For Taiwan, compliance summary tables provided in the most recent ICCAT Annual Report for 2020-2021 note that there have been no compliance issues recorded and that no compliance action is required for the two-year reporting period in question.

ICCAT has also actively incorporated Port State Measures (PSM) requirements including obligations for participating members' vessels to undertake prior notification of port entry, use designated ports, restrictions on landing/transhipment of fish, relevant catch documentation requirements and port inspections, as well as IUU vessel listing processes, trade-related measures and where necessary, sanctions. Reports from annual COC meetings and the plenary session of the Commission, as well as the range of fishery specific observer reports, logbook and other data submissions, and national and regional MCS operations all combine to provide reliable evidence that there is compliance with the management system.

ICCAT's most recent (2016) external review process did note opportunities to improve MCS performance, including a stronger focus on establishing levels of compliance by members with respect to observer coverage commitments, management of CPC's use of fish aggregating devices, and other catch and quota related management issues.

For Taiwan nationally, there is an established and effective MCS framework in place for the DWFV fleet, including UoA vessels. There are dedicated TFA fisheries inspectors stationed overseas, and 1 of them is stationed semi permanently in Cape Town to inspect Atlantic tuna fishing vessels. TFA has also recently increased its MCS capability through operation of a contemporary Fisheries Monitoring Centre. In addition to

monitoring DWFV operations via daily and four-hourly electronic catch reporting, the integrated FMC also has the capability to respond to potential MCS breaches in near real time. TFA have provided details of a recent incident response whereby a purse seine vessel (FB NO.707) that was not transmitting VMS locational data during a period of a FAD closure. The FMC followed up quickly with both the vessel owner and fishing master and investigated. The vessel was subsequently prosecuted and a fine issued by TFA in 2020. Taiwanese vessels undertake daily electronic logbook catch reporting and VMS data is also processed and analysed at the FMC. ICCAT COC reports, and evidence of TFA MCS capabilities and practices indicate that compliance is generally adequate with evidence of sanctions being implemented by Taiwan in recent years. These are likely to be effective. The SG 80 level is met. SG 100 is not met as it cannot be said that there is a high degree of confidence that fishers comply with all aspects of the management system.				
d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	
	Met?		Yes	
Rationale				
The focus for this Scoring Issue is flag states operating within ICCAT's area of competency. In general, coastal states within the UoA have a particular interest in protecting their fisheries resources and ensuring long term sustainable benefits from these resources. This extends to an interest in ensuring that management arrangements are comprehensive, efficient and robust, and non-compliance is minimized. The information presented throughout PI 3.2.3 suggests no evidence of systematic non-compliance. Of the compliance breaches identified in COC reporting, most relate to breaches of reporting deadlines or data not being provided in the required format. However, there is also evidence of more serious infringements of management measures, including catches by some ICCAT CPCs in excess of sustainable limits imposed for key species including Atlantic Bigeye, and Atlantic Yellowfin Tuna stocks. These do not appear to constitute systematic non-compliance; and it is also noted that even in well-managed domestic fisheries, with effective MCS systems in place, some non-compliance will occur. Overall, there does not appear to be evidence of systematic non-compliance at either the regional or flag level; as such SG 80 is met.				
References				
ICCAT Compendium of Management Recommendations and Resolutions. UNFSA, UNCLOS; ICCAT Convention; Taiwan Fisheries Act 2016; Taiwan Distant Water Fisheries Act 2016; SCS 2018; Pew 2019; ICCAT Annual Report 2020-21; Medley et al. 2021.				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	60-79
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	

Overall Performance Indicator score	
Condition number (if relevant)	

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	No
Rationale				
ICCAT's fisheries management framework and procedures are the assessment focus for this Performance Indicator; with responsibility for both sustainability and management of the target stocks, as well as broader ecological impacts from fishing. ICCAT has well developed arrangements to provide fishery specific information to the Secretariat and Commission Members, particularly through the activities of the science focussed SCRS, and the MCS focused COC. Both groups have key roles to play in monitoring and evaluating key parts of the fishery-specific management system, and are comprised of representatives from CPC's, technical advisors/experts and observers (both IGO and NGO). ICCAT has also adopted a 2015-2020 Science Strategic Plan (SSP) to guide operation of the SCRS. This Plan Objectives and Strategies to achieve goals, as well as measurable targets to enable an effective evaluation and review process. For the COC, key evaluation roles include monitoring and reviewing compliance with management measures adopted by the Commission and making recommendations to improve MCS outcomes; and reviewing implementation of cooperative MCS measures, and making recommendations to the Commission for improvements to these. SG60 and SG80 requirements are met as there are mechanisms in place to evaluate key parts of the fishery-specific management system. SG100 is not met as it is not clear that these arrangements cover all parts of the fishery-specific management system.				
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	No
Rationale				
In addition to the day-to-day management and administration functions and responsibilities for the ICCAT Secretariat and CPC's with respect to monitoring and performance evaluation of key fisheries management				

measures (primarily through review of Resolutions and Recommendations), ICCAT has also commissioned formal independent and external performance evaluation reviews in recent years. These have driven performance improvements in several key areas including operational fisheries management, MCS outcomes, and information management, including a more accessible and comprehensive website structure aiding transparency and utility both for CPC's and key stakeholders. In addition to external review processes driven through ICCAT's own performance evaluation approaches, there have also been a number of externally driven review processes assessing and reporting on ICCAT's fisheries management performance with the objective of enabling further improvements to these. Overall, there is strong evidence that ICCAT's fishery management system is subject to regular internal and occasional external review. As such SG 60 and SG 80 requirements are met. However, whilst there have been several external reviews, it is not clear that these are an established Commission process and will continue regularly into the future, thus SG 100 is not met.	
References	
ICCAT 2009; ICCAT 2016; Pew 2019; WWF 2007; ICCAT Compendium of Management Recommendations and Resolutions; UNFSA; Medley et al. 2021.	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

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6 Appendices

6.1 Assessment information

6.1.1 Small-scale fisheries

This fishery is not a small scale fishery.

6.2 Evaluation processes and techniques

6.2.1 Site visits

Information will be included at the client and peer review draft report stage.

6.2.3 Evaluation techniques

Documentation and Information Gathering

One of the most critical aspects of the MSC certification process is ensuring that the assessment team gets a complete and thorough grounding in all aspects of the fishery under evaluation. In even the smallest fishery, the assessment team typically needs documentation in all areas of the fishery from the status of stocks, to ecosystem impacts, through management processes and procedures.

Under the MSC program, it is the responsibility of the applying organizations or individuals to provide the information required proving the fishery or fisheries comply with the MSC standards. It is also the responsibility of the applicants to ensure that the assessment team has access to any and all scientists, managers, and fishers that the assessment team identifies as necessary to interview in its effort to properly understand the functions associated with the management of the fishery. Last, it is the responsibility of the assessment team to make contact with stakeholders that are known to be interested or actively engaged in issues associated with fisheries in the same geographic location.

Scoring and Report Development Process

ACDR: The Announcement Comment Draft Report was completed on 6/10/2022. The client decided to continue with the full assessment.

Following MSC guidance published in the interpretation request log (https://mscportal.force.com/interpret/s/article/Contacting-stakeholders-stakeholder-consultation-and-registered-stakeholders) SCS did not contact any stakeholders at the PCDR publication stage, as there were no registered stakeholders and SCS conducted a robust stakeholder registration process allowing stakeholders to either opt in or opt out of communications regarding the assessment.

Scoring Methodology

The assessment team followed guidelines in MSC FCP v2.2 Section 7.10 “Scoring the fishery”. Scoring in the MSC system occurs via an Analytical Hierarchy Process and uses decision rules and weighted averages to produce Principle Level scores. There are 28 Performance Indicators (PIs), each with one or more Scoring Issues (SIs). Each of the scoring issues is considered at the 60, 80, and 100 scoring guidepost levels. The decision rule described in Table 31 determines the Performance Indicator score, which must always be in an increment of 5. If there are multiple ‘elements[19]’ under consideration (e.g. multiple main primary

19 MSC FCPV2.1 7.10.7: In Principle 1 or 2, the team shall score PIs comprised of differing scoring elements (species or habitats) that comprise part of a component affected by the UoA.

species), each element is scored individually for each relevant PI, then a single PI score is generated using the same set of decision rules described in Table 31.

Table 31. Decision Rule for Calculating Performance Indicator Scores based on Scoring Issues, and for Calculating Performance Indicator Scores in Cases of Multiple Scoring Elements. (Adapted from MSC FCPV2.2 Table 4)

Score	Combination of individual SIs at the PI level, and/or combining multiple element PI scores into a single PI score.
<60	Any scoring element/SI within a PI which fails to reach SG60 shall not be assigned a score as this is a pre-condition to certification.
60	All elements (as scored at the PI level) or SIs meet SG60 and only SG60.
65	All elements/SIs meet SG60; a few achieve higher performance, at or exceeding SG80, but most do not meet SG80.
70	All elements/SIs meet SG60; half* achieve higher performance, at or exceeding SG80, but some do not meet SG80 and require intervention action to make sure they get there.
75	All elements/SIs meet SG60; most achieve higher performance, at or exceeding SG80; only a few fail to achieve SG80 and require intervention action.
80	All elements/SIs meet SG80, and only SG80.
85	All elements/SIs meet SG80; a few achieve higher performance, but most do not meet SG100.
90	All elements/SIs meet SG80; half achieve higher performance at SG100, but some do not.
95	All elements/SIs meet SG80; most achieve higher performance at SG100, and only a few fail to achieve SG100.
100	All elements/SIs meet SG100.

**MSC FCPV2.2 uses the word 'some' instead of half. SCS considers 'half' a clearer description of the methodology utilized.*

When calculating the Principle Indicator scores based on the results of the Scoring Issues (SI), SCS interprets the terms in Table 2 as follows:

- **Few:** Less than half. Ex: if there are a total of three SIs, one SI out of 3 is considered few.
- **Some:** Equal to half. Ex: if there are a total of four SIs, two SIs out of 4 is considered some.
- **Most:** More than half. Ex: if there are a total of three SIs, two SIs out of 3 is considered most.

6.3 Peer Review reports

To be drafted at Public Comment Draft Report stage.

6.4 Stakeholder input

To be included at the Client and Peer Review Draft Stage. Stakeholder input at the ACDR stage will be posted on the MSC database.

Table 32. Summary of Stakeholder Submissions

6.5 Conditions

6.5.1 Summary of conditions closed under previous certificate

The CAB shall include a summary of conditions that were closed during the previous certificate.

6.5.2 New conditions & Client Action Plan

To be added at the Client and Peer Review Draft stage.

6.6 Client Action Plan

To be drafted at Public Comment Draft Report stage.

6.7 Surveillance

To be drafted at Client and Peer Review Draft Report stage.

6.8

6.8 Harmonised fishery assessments

6.8.1 Principle 1

Principle 1 tuna fisheries in the North and South Atlantic Ocean have been the subject of harmonization discussions. In 2021 CAB representative and team members participated in harmonization discussions, which resulted in agreed scores for Principle 1 for albacore stocks in the North and South Atlantic Ocean managed by the ICCAT.

Following the 2016 Harmonization Workshop, CABs have reviewed new information, participated in harmonization discussions and adjusted rationales, and relevant scores. The sections below describe subsequent harmonization discussions in which SCS participated. Currently, all scores are harmonized except for some minor differences in the SG80-100 bracket. These differences do not affect the overall outcome of the Principle 1 assessment.

In 2018, in recognition of different timelines to address Principle 1 conditions across MSC certified tuna fisheries, the MSC required all tuna and tuna-like fisheries (herein, tuna fisheries) certified against MSC Fisheries Standard v1.3 to update to v2.0. Additionally, there are requirements to harmonize timelines for P1 conditions (limited to those concerning harvest strategies and harvest control rules).

In 2020 and again in March 2021 in response to the Covid-19 Derogation issued by MSC, 18 months was added to all P1 fishery conditions, including harmonized conditions.

North Atlantic Albacore
This fishery overlaps with other fisheries targeting North Atlantic albacore stocks. See Table 33.

Table 33. Fisheries in the MSC System Considered for Harmonization for Principle 1 for Albacore stocks as of June 2020.

	Fishery	URL	Status	Principles for Harmonization	Conformity Assessment Body
1	US North Atlantic swordfish, yellowfin, and albacore tuna fishery	https://fisheries.msc.org/en/fisheries/us-north-atlantic-swordfish-yellowfin-and-albacore-tuna-fishery/@@assessments	RE-certified 2018	P1	MRAG
2	North Atlantic albacore artisanal fishery	https://fisheries.msc.org/en/fisheries/north-atlantic-albacore-artisanal-fishery/@@view	Certified June 2016	P1	Bureau Veritas
3	Tri Marine Atlantic albacore (Thunnus alalunga) longline fishery	https://fisheries.msc.org/en/fisheries/tri-marine-atlantic-albacore-longline-fishery/@@view	In Assessment	P1	SCS Global Services

Table 34. Alignment of Scores for Harmonization

PI	Tri Marine Atlantic albacore (Thunnus alalunga) longline fishery	North Atlantic albacore artisanal fishery	US North Atlantic swordfish, yellowfin, and albacore tuna fishery	Comments
PI 1.1.1	100	100	100	There was initial agreement among Assessment Teams.
PI 1.2.1	95	95	95	There was initial agreement among Assessment Teams.
PI 1.2.2	~~80~~ 85*	85	85	After further discussions among assessors and review of the evidence associated with PI1.2.2 SI-a it was concluded that HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY. The Tri Marine Atlantic albacore score for SI-a was raised from 80 to 100 resulting in a revised overall harmonized score of 85 for PI1.2.2.
PI 1.2.3	80	80	80	There was initial agreement among Assessment Teams.
PI 1.2.4	90	~~100~~ 90*	~~100~~ 90*	After further discussions among assessors and review of the evidence associated with PI1.2.4 SI-e it was concluded that the assessment had not been externally peer reviewed. The PI1.2.4 SI-e scores associated with the albacore artisanal fishery and US North Atlantic fishery were down scored from 100 to 80 resulting in a revised overall harmonized of 90 for PI1.2.4.

*** modified after harmonisation discussions**

Supporting information	
Describe any background or supporting information relevant to the harmonisation activities, processes and outcomes.	
Assessment teams from MRAG, Bureau Veritas, and SCS coordinated harmonisation discussions via email.	
Was either FCP v2.2 Annex PB1.3.3.4 or PB1.3.4.5 applied when harmonising?	Yes
Date of harmonisation meeting	Harmonization discussion was held via email from June 8, 2021-July 7, 2021
If applicable, describe the meeting outcome	

Agreement found among all Assessment Team members.

South Atlantic Albacore

The assessment team was unable to identify any overlapping fisheries for South Atlantic Albacore. The team will update this accordingly as part of the site visit.

6.8.2 Principle 2

As Principle 2 evaluates fleet specific impacts, the scores may vary based on each fleet's catch behavior and interactions. Therefore, harmonization is considered for consistency, but scores may vary. Explanations for these differences are provided only in cases where results vary more than a score of 15 points on the same performance indicators, among assessments. MSC v2.1 requires additional considerations under Principle 2 for Cumulative Impacts.

v2.01 of the MSC standard requires that any fishery under assessment that has spatial overlap with the Units of Assessment of any other MSC certified fisheries, be explicitly considered in Principle 2 for cumulative impacts. To ensure that the cumulative impact of all MSC fisheries is within sustainable limits, a UoA assessed against standard v2.01 may need to consider the combined impact of itself and other overlapping UoAs. This determination will include other UoAs assessed against earlier versions of the CR (e.g., v1.3). However, the MSC Interpretations log[1] has clarified that "...the first two paragraphs of guidance on 'MSC UoAs and the assessment of cumulative impacts' in Table GSA3 may be taken as a suggestion and does not need to be implemented. The expectation would be that fisheries assessed against v2.0 of the standard shall only be required to consider cumulative impacts with other v2.0 fisheries". In this case SCS has only considered cumulative considerations for this v2.0 fishery, relative to other overlapping v2.0 fisheries.

'Overlapping UoAs' are assessed at different levels depending on which PI is evaluated. All scores for this fishery are harmonized with the Tri Marine Atlantic Albacore longline assessment when applicable. Any deviations in the assessment are due to differences in bait use or catch composition between the analyzed vessels and time periods.

Primary Species

For P2 primary species, teams need to evaluate whether the cumulative impact of overlapping MSC UoAs hinders the recovery of 'main' primary species. According to FCP v2.1 Table GPB1, PI 2.1.1 a should be harmonized for '*stocks that are 'main' in both UoAs, harmonise status relative to PRI (at SG60,80 and 100), and if below PRI, harmonise cumulative impacts at SG80 (not at SG60)*.'

Bigeye and blue shark (north and southern stocks) are the only main primary species in this fishery for which consideration of the cumulative impacts of all versions 2.01 fisheries would apply. The overall status of Atlantic Bigeye, North Atlantic Blue Shark, and South Atlantic Blue shark stocks are discussed in PI 2.1.1.

The assessment team has identified other fisheries and scores related to bigeye tuna as shown below. No harmonization was needed based on the alignment of scores under 2.1.1(a). The assessment team also examined the classification of blue shark under other Atlantic longline MSC assessments, and though they are considered managed and therefore primary under the MSC Standard, they were considered "minor" rather than primary in other fisheries examined.

Table 35. Comparison of scores for primary main species, bigeye tuna, across a sample of other MSC assessments.

Fishery name	CAB	Report Version	2.1.1(a)	Comments
Standard v2.0/2.01				
Sant Yago TF Unassociated purse seine Atlantic yellowfin tuna fishery	Bureau Veritas	PCR Scope Ext May 2021	60	
US North Atlantic swordfish, yellowfin, and albacore tuna fishery	MRAG	PCR Re-Assess 2017	<60	failed SG60 under (a), passed SG80 under (c)
AGAC four oceans Integral Purse Seine Tropical Tuna Fishery	Lloyds	Final Draft Report Nov 2021	60	
North West Atlantic Canada longline swordfish	Lloyds	PCR Re-Assess 2016	<60	failed SG60 under (a), passed SG80 under (c)
Tri Marine Atlantic Albacore longline fishery	SCS	CPRDR Nov 2021	60	

Secondary Species

For secondary species, cumulative impacts only need to be considered in cases where two or more UoAs have 'main' catches that are 'considerable', defined as a species being 10% or more or the total catch. The MSC requires that 2.2.1 a is harmonized for stocks that are 'main' in both UoAs, harmonise status relative to Biologically Based Limits (at SG60, 80, and 100), and if below Biologically Based Limits, harmonise cumulative impacts at SG80 (not at SG60) (FCP v2.1, Table GPB1).

The other main secondary species are bait, which consist of Indian oil sardine and Bali sardinella. No other fishery identifies bali sardinella as their main secondary species, however, Indian oil sardine is a main secondary species used by the SZLC CSFC & FZLC FSM EEZ Longline Yellowfin and Bigeye Tuna Fishery. All scores for Indian oil sardine were harmonized with this fishery. The SZLC CSFC & FZLC FSM fishery uses an estimated 2,500 tonnes per year. When combined with the annual use for this assessment (1,500 t), the total volume reaches 4,000 t per year, which is 1.6% of the total annual landings for the species. The small volume used by the two certified fleets compared to the total annual landings means that it is highly unlikely the cumulative 'catches' impact the species and it is highly likely Indian oil sardine are above biologically based limits.

ETP Species

For ETP species, the combined impacts of MSC UoAs needs to be evaluated at 2.3.1 a only in cases where there are any national and/or international requirements that set catch limits for ETP species applicable to both UoAs (at SG60, 80 and 100), and cumulative effects of the UoAs at SG80 and SG100 (not at SG60) (Table GPB1). As there are no catch limits for ETP species in this fishery, consideration of cumulative impacts is not required.

Habitat

For habitats, fisheries are required to harmonize for 2.4.1 b regarding recognition of VMEs where both UoAs operate in the same 'managed area/s' (see Guidance to the MSC Fisheries Standard) and for 2.4.2 a,c at SG100 since all fishery impacts are considered (not at SG60 or 80) (Table GPB1).

The requirements here aim to ensure that vulnerable marine ecosystems (VMEs) are managed such that the impact of all MSC UoAs does not cause serious and irreversible harm to VMEs. The North and South Atlantic Albacore Longline fishery does not interact with any VME habitat. Harmonization is not required for Principle 2 at this stage.

6.8.3 Principle 3

Harmonisation requirements for PIs 3.1.1 – 3.1.3 is situation dependent. If both UoAs are part of the same larger fishery or fleet or have stocks in either P1 or P2 that are at least partially managed by the same jurisdiction(s) (nation states, RFMOs, or others) or under the same agreements, then the fisheries are required to be harmonized (FCP v2.1, Table GPB1). Harmonisation may sometimes be possible for those management arrangements that apply to both UoAs (noting the limitations accepted in GPB1.3). The MSC accepts that it may be impractical to attempt full harmonisation, due to the large number of fisheries that may be managed under the relevant policy framework, and the differences in application between them.

PI's 3.2.1 – 3.2.4, harmonization is also situation dependent and required when both UoAs have stocks within either P1 or P2 that are at least partially managed by the same jurisdiction(s) (nation states, RFMOs, or others) or under the same agreements. Harmonisation is needed for those management arrangements that apply to both UoAs e.g., at the RFMO level but not the national level in the case of 2 separate national fleets both fishing the same regional stock.

In the fisheries identified which operate in the Atlantic, full harmonization was conducted with the Tri Marine Atlantic Albacore fishery (currently in assessment) given that the UoA was identical for these assessments.

6.9 Objection Procedure

To be added at Public Certification Report stage

6.10 Certificate Sharing Mechanism

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21/March/2022

STATEMENT OF CERTIFICATE SHARING MECHANISM - *Tuna Alliance Inc*

Tuna Alliance Inc confirms its willingness to share the MSC certification of the Atlantic Longline Albacore.

The applicants who are selected and approved by ***Tuna Alliance Inc*** will be eligible to enter into a certificate sharing agreement with the ***Tuna Alliance Inc*** based on:

1. Equitable sharing of internal and external costs incurred due to the assessment processes.

2. Full compliance with the MSC Fisheries Standards and Certification Requirements, including any conditions, terms, policies, and recommendations set for the certification and subsequent programs of corrective action to address such conditions and recommendations.

Yours faithfully,

On behalf of ***Tuna Alliance Inc*** :

Jack Huang
Commercial & Compliance,
Tuna Alliance Inc.
21/March/2022

6.11 Vessel List

Table 36. Vessels included in the UoC in the full assessment. All vessels are flagged to Taiwan.

NO.	VESSEL NAME(EN)	REGISTRATION #	IMO #
01.	Yun Mao No.1	CT6-1507	9876581
02.	Yun Mao No.8	CT6-1522	9899868
03.	Yun Mao No.101	CT6-1524	9911953
04.	Yun Mao No.102	CT6-1519	9889203
05.	Yun Mao No.168	CT6-1449	9776315
06.	Yuh Mao No.106	CT6-1036	8417792
07.	Sheng Mao No.222	CT6-1042	8648406
08.	Fu Mao No.268	CT7-0594	9395812
09.	Chien Tsao No.322	CT6-1003	8417077
10.	Chien Jui No.102	CT6-1004	8417065
11.	Chin Chang Long	CT6-1013	8648212
12.	Chin Liang Mei	CT6-1021	8648262
13.	Ying Chin Hsiang No.101	CT7-0564	9230828
14.	Full Always	CT6-1103	8648133
15.	Chin Hsing No.1	CT6-1278	8648248
16.	Maan Fwu No.188	CT6-1485	9820221
17.	Maan Fwu No.666	CT6-1440	9763825
18.	Maan Fwu No.668	CT6-1353	9176345
19.	Maan Farn No.1	CT6-1438	9778284

7 Template information and copyright

This document was drafted using the 'MSC Reporting Template v1.2'.

Template version control		
Version	Date of publication	Description of amendment
1.0	17 December 2018	Date of first release
1.1	29 March 2019	Minor document changes for usability
1.2	25 March 2020	Release alongside Fisheries Certification Process v2.2

A controlled document list of MSC program documents is available on the MSC website (msc.org).

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