Food Certification International Ltd

Findhorn House
Dochfour Business Centre
Dochgarroch
Inverness, IV3 8GY
United Kingdom

T: +44(0)1463 223 039
F: +44(0)1463 246 380

FCI
Specialist assurance for the fisheries and aquaculture sectors

www.foodcertint.com

MSC SUSTAINABLE FISHERIES CERTIFICATION

Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

Final Report

March 2015

Prepared For: **Pesqueras Echebastar S.A**

Prepared By: **Food Certification International Ltd**

CERTIFIED SUSTAINABLE SEAFOOD MSC www.msc.org

Final Report

March 2015

Authors: Nick Pfeiffer, Luis Ambrosio, Michael Keatinge, Joseph DeAlteris

Certification Body:
Food Certification International Ltd

Address:
Findhorn House
Dochfour Business Centre
Dochgarroch
Inverness, IV3 8GY
Scotland, UK

Name: Fisheries Department
Tel: +44(0) 1463 223 039
Email: fisheries@foodcertint.com
Web: www.foodcertint.com

Client:
Pesqueras Echebastar S.A

Address:
Muelle Erroxape s/n
48370 Bermeo.
Bizkaia, Spain

Name: Unai Ganzedo
Tel: +34 699165714
Email: unai.ganzedo@flotaechebastar.com

Contents

Glossary ..... **v**
1. Executive Summary **1**
2.1 Assessment Team 3
2.1.1 Peer Reviewers 5
2.1.2 RBF Training 5
3. Description of the Fishery **6**
3.1 Unit(s) of Certification and scope of certification sought 6
3.2 Overview of the fishery 7
3.2.1 Pesqueras Echebastar S.A 7
3.2.2 Species and Fishing Practice 9
3.2.3 Administrative Framework 12
3.3 Principle One: Target Species Background 14
3.3.1 Skipjack tuna 14
3.3.2 Yellowfin tuna 28
3.3.3 Bigeye tuna 45
3.3.4 Fisheries Management & IOTC 59
3.4 Principle Two: Ecosystem Background 70
3.4.1 Retained species 70
3.4.2 Bycatch species 81
3.4.3 Endangered, threatened and protected species 81
3.4.4 Habitat impacts. 85
3.4.5 Ecosystem 91
3.5 Principle Three: Management System Background 93
3.5.1 Legislative framework 93
3.5.2 Consultation, roles and responsibilities 97
3.5.3 Long-term objectives 97
3.5.4 Incentives for sustainable fishing 98
3.5.5 Fishery specific objectives 98
3.5.6 Decision-making processes 99
3.5.7 Compliance and enforcement 99
3.5.8 Research plan 101
3.5.9 Monitoring and management performance evaluation 101
4. Evaluation Procedure **102**
4.1 Harmonised Fishery Assessment 102
4.1.1 Harmonisation Details 102
4.2 Previous assessments 105
4.3 Assessment Methodologies 105
4.3.1 Assessment Tree 105

4.4 Evaluation Processes and Techniques 105
4.4.1 Site Visits 105
4.4.2 Consultations 106
4.4.3 Evaluation Techniques 109
4.4.4 RBF Use 111
5. Traceability 114
5.1 Eligibility Date 114
5.2 Traceability within the Fishery 114
5.2.1 Description of Tracking, Tracing and Segregation Systems within the Fishery and Management systems in place relating to Traceability 114
5.2.2 Evaluation of Risk of Vessels Fishing Outside of UoC 115
5.2.3 Risk of Substitution of Mixing Certified / Non-Certified Catch prior to point of landing 116
5.2.4 At-Sea Processing 116
5.2.5 Trans-Shipment 116
5.2.6 Robustness of management systems relating to traceability 116
5.3 Eligibility to Enter Further Chains of Custody 117
5.3.1 Eligible points of landing 117
5.3.2 Parties eligible to use the fishery certificate 117
5.4 Eligibility of Inseparable or Practically Inseparable (IPI) stock(s) to Enter Further Chains of Custody 117
6. Evaluation Results 118
6.1 Principle Level Scores 118
6.2 Summary of Scores 118
6.3 Summary of Conditions 119
6.3.1 Outcomes of RBF use and stakeholder discussions 119
6.3.2 Recommendations 119
6.4 Determination, Formal Conclusion and Agreement 120
7. References 121
Appendix 1. Scoring & Rationale 124
Appendix 1a - MSC Principles & Criteria 124
Appendix 1.1 Performance Indicator Scores and Rationale 127
Appendix 1.2 Risk Based Framework (RBF) Outputs 261
Appendix 1.2.1 Scale Intensity Consequence Analysis (SICA) 261
Appendix 1.3 Conditions 264
Condition 1 Yellowfin tuna 264
Condition 2 Yellowfin tuna 265
Condition 3 Skipjack tuna 266
Condition 4 Skipjack tuna 267
Condition 5 Bigeye tuna 268
Condition 6 Bigeye tuna 269

Condition 7 All UoCs 270
Condition 8 All UoCs 271
Condition 9 All UoCs 273
Condition 10 All UoCs 274
Appendix 2. Peer Review Reports 287
Peer Reviewer 1 287
Peer Reviewer 2 303
Appendix 3. Stakeholder submissions 342
IPNLF - John Burton, ... 342
Greenpeace - Cat Dorey 367
ISSF (International Seafood Sustainability Foundation) - Ana Justel 375
PNA Tuna - Maurice Brownjohn 378
WWF – (World Wide Fund for Nature) 382
AWI (Animal Welfare Institute) – Kate O' Connell 441
MSC - Marine Stewardship Council 453

Glossary

ANABAC	Asociacón Nacional de Armadores de Buques Atuneros Congeladores
ASAP	Age structured assessment program
ASPM	Age structured production model
AZTI	Spanish (Basque) fisheries research institute
BET	Bigeye tuna
B_{lim}	Limit biomass reference point, below which recruitment is expected to be impaired.
B_{msy}	Biomass achieving maximum sustainable yield
B_{pa}	Precautionary reference point for spawning stock biomass
CEPESCA	Confederación Española de Pesca (Spanish fishing industry federation)
CITES	Convention on International Trade in Endangered Species of Flora and Fauna
CPUE	Catch per unit effort
dFAD	drifting Fish aggregating device
EC	European Commission
EEZ	Exclusive Economic Zone
ETP	Endangered, threatened and protected species
EU	European Union
F	Fishing Mortality
FAD	Fish aggregating device
FAO	Food and Agriculture Organisation of the UN
F_{lim}	Limit reference point for fishing mortality that is expected to drive the stock to the biomass limit
F_{MSY}	Fishing mortality achieving maximum sustainable yield
F_{pa}	Precautionary reference point of fishing mortality expected to maintain the SSB at the precautionary reference point
FAM	MSC's Fisheries Assessment Methodology
FAO	United Nations Food and Agriculture Organisation
HCR	Harvest Control Rule
IOTC	Indian Ocean Tuna Commission

IUU	Illegal, unreported and unregulated fishing
LL	Longline
LME	large marine ecosystem
MCS	Monitoring, Control and Surveillance
MFCL	Multifan-Cl (a statistical length based age structured stock model)
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation
MSY	Maximum Sustainable Yield
NGO	Non-Governmental Organisation
OPAGAC	Organización de Productores Asociados de Grandes Atuneros Congeladores
P1	MSC Principle 1
P2	MSC Principle 2
P3	MSC Principle 3
PI	MSC Performance Indicator
PSA	productivity-susceptibility analysis
RBF	MSC's risk based framework
RFMO	Regional Fisheries Management Organisation
SC	Scientific Committee of the Indian Ocean Tuna Commission
SFA	Seychelles Fishing Authority
SI	Scoring Issue (MSC)
SICA	Scale Intensity Consequence Analysis
SKJ	Skipjack tuna
SONAR	Sound navigation and ranging
SSB	Spawning Stock Biomass
SS3	Stock Synthesis 3. Length based stock assessment modeling technique
SWIOP	Development and Management of Fisheries in the Southwest Indian Ocean
TAC	Total Allowable Catch
UoC	Unit of Certification

UNCLOS	United Nations Convention on the Law of the Sea
VMS	Vessel Monitoring System
WPB	Working Party on Billfish
WPEB	IOTC Working Party on Ecosystems and Bycatch
WPTT	IOTC Working Party on Tropical Tunas
WWF	World Wide Fund For Nature
YFT	Yellowfin tuna

1. Executive Summary

This report provides details of the MSC assessment process for the Pesqueras Echebastar Indian Ocean skipjack, yellowfin and bigeye freeschool purse seine tuna fishery. The assessment process reported on in this Report does not include those catches of tuna made using FADs, the three Units of Certification covering the FAD related catches of tuna still remains under assessment but are being progressed on a different timeline, the outcome of the assessment of these three additional UoCs will be reported on within a separate Public Comment Draft Report.

The assessment process began in January 2013 and was concluded March 2015

A comprehensive programme of stakeholder consultations were carried out as part of this assessment, complemented by a full and thorough review of relevant literature and data sources.

A rigorous assessment of the wide ranging MSC Principles and Criteria was undertaken by the assessment team and a detailed and fully referenced scoring rationale is provided in the assessment tree provided in Appendix 1.1 of this report.

The Actual Eligibility Date for this assessment is 9th December 2014.

The assessment team for this fishery assessment comprised of Nick Pfeiffer who acted as team leader and primary Principle 2 specialist; Michael Keatinge who was primarily responsible for evaluation of Principle 1 and Luis Ambrosio who was primarily responsible for evaluation of Principle 3.

Client fishery strengths

The tuna stocks that form the basis of the Units of certification are all in good condition, are being harvested sustainably and most elements of an appropriate and precautionary management system are in place. Shortcomings in the management system identified during the assessment process are presently being addressed through the responsible authority for tuna stock management in the Indian Ocean (Indian Ocean Tuna Commission).

Overall, the fisheries are considered to be profitable and are an important source of revenue, employment and food throughout many Indian Ocean coastal nations as well as for other nations with distant water fleets including Spain.

Freeschool fisheries do not rely on the use of artificial floating objects to aggregate tuna's references. This results in characteristically clean catches that feature very little by way of bycatch of unwanted species. The fishery has a low interaction with endangered, threatened and protected species and there are high levels of post capture survival for ETP specimens that may be encountered during fishing operations. The purse seine gear used does not make contact with the seabed and habitat interactions are negligible.

The fishery has undertaken to implement 100% observer coverage voluntarily and an agreement has been entered into with the Seychelles Fishing Authority to provide the necessary observer support to meet this objective.

Pesqueras Echebastar are committed to long term sustainability of Indian Ocean tuna fisheries and this is demonstrated through the companies active involvement in fisheries research projects aimed at improving the sustainability of the fisheries by reducing levels of overall bycatch through changes to fishing practices, improved data recording, increased transparency as well as new and improved fishing gear and vessel design.

The fisheries management arrangements are appropriate to the nature and scale of industrial tuna fisheries and are able to govern the level of fisheries exploitation in an informed and transparent manner, employing clearly defined decision-making process, which increasingly take account of the precautionary principle.

Client fishery weaknesses

Some weaknesses in the management of tuna stocks have been documented during the assessment process. Main weaknesses in relation to Principle 1 relate to the basis for target and limit reference points that are in use for each of the stocks covered by the certification. IOTC Resolution 13/10 sets interim target (BMSY and FMSY) and limit (BLIM = 0.40 BMSY and FLIM = 1.40 FMSY) reference points for tuna stocks. However, no rationale is available to support these choices. There is also a lack of a clear well defined harvest control rule by which fishing mortality can be managed in a prescribed manner and which encapsulates the precautionary principle.

Under Principle 2, in terms of fishery interactions with non-target species, information is considered adequate in relation to retained tuna catch and supports a partial strategy to manage impacts on bigeye, yellowfin and skipjack tuna. However, both the silky shark and oceanic white tip shark as well as other ETP species including manta rays and turtles are known to exist as bycatch in the fishery, along with other vulnerable retained species including some ray species. Thesespecies are considered vulnerable to population impacts through bycatch in commercial fisheries. Recent collection of information on bycatches of these species in the Pesqueras Echebastar fisheries does not support ongoing management of stocks of shark and ray species and is not adequate to fully understand and monitor the specific impact that the freeschool fishery may be having on bycaught these species.

In terms of Principle 3, fisheries management objectives are not well defined in general. Some reference points associated to interim values, have been adopted for several IOTC stocks through the IOTC Resolutions 13/10 and 12/14. Some objectives are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 and are explicit within the fishery's management system. Bmsy/Fmsy objectives are well defined and currently some IOTC Resolutions make specific reference to the precautionary approach and to long-term sustainable utilization of tuna stocks. In the national context (Spain and Seychelles), there does not appear to be any short-term objectives explicitly designed to achieve the outcomes expressed by MSC's Principles 1 and 2. Seychelles, as member of IOTC, adopts the management measures proposes by IOTC but don't have a management plan with short-terms objectives included.

All these shortcomings are addressed in the certification by the implementation of conditions of certification that are required to be met with and fully closed out within the five-year life of the certificate.

Determination

On completion of the assessment and scoring process, the assessment team has concluded that the Pesqueras Echebastar Indian Ocean freeschool skipjack, yellowfin and bigeye purse seine tuna units of certification should be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.

Rationale

There are a number of areas which reflect positively on the fishery. All stocks considered in the assessment are in good condition and have recovered from earlier periods of low biomass. The fishery is operated by a small number of modern technologically advanced vessels that carry observer on all fishing trips and which operate permanent VMS. There is very little interaction with other ecosystem components. There is an ocean wide management framework in place as well as an EU fleet management framework that covers the operations of the fleet under assessment.
There is a record of high compliance with fishing rules by the assessed fleet.

Conditions & Recommendations

A number of criteria which contribute to the overall assessment score scored less than the unconditional pass mark, and therefore trigger a binding condition to be placed on the fishery, which must be addressed in a specified timeframe (within the 5 year lifespan of the certificate). Full explanation of these conditions is provided in **Section 1.3** of the report.

For interested readers, the report also provides background to the target species and fishery covered by the assessment, the wider impacts of the fishery and the management regime, supported by full

details of the assessment team, a full list of references used and details of the stakeholder consultation process.

FCI Ltd confirms that this fishery is within scope.2.

Authorship and Peer Reviewers

2.1 Assessment Team

All team members listed below have completed all requisite training and signed all relevant forms for assessment team membership on this fishery.

Assessment team leader: Nick Pfeiffer

Primarily responsible for assessment under Principle 2.

Nick Pfeiffer is a fisheries and marine environmental specialist with a diverse experience and in-depth knowledge of marine fisheries. Nick's experience as a fishery scientist spans 15 years and includes the development of fisheries technical conservation measures for commercial fisheries as well as the evaluation of the impacts of a variety of fishing methods on marine ecosystems. Nick is based in the west of Ireland where he is a founding director of the environmental and ecological services company MERC Consultants. As a marine ecologist and aquatic resource specialist with a particular interest in interactions between nature and both aquaculture and capture fisheries Nick provides a range of aquatic environmental and ecological services mainly in support of aquatic nature conservation, fisheries and aquaculture and marine renewable energy. Nick heads up aquaculture and capture fisheries related aspects of MERC's work while also contributing to other projects such as aquatic habitat mapping, benthic faunal studies and survey work in connection with appropriate assessments for fisheries and aquaculture in Natura 2000 sites.

Nick's academic background includes undergraduate studies in aquaculture and marine science at the University of Plymouth, while he also conducted postgraduate research in fisheries at the University of Georgia and at University College Galway. He was employed as a fisheries scientist with the Irish government from 1992 to 1995. Between 1995 and 1997 Nick was manager of the Marine Fisheries Environment Unit at University College Galway.

Expert team member: Michael Keatinge

Primarily responsible for assessment under Principle 1.

Michael has been Fishery Development Manager with the Irish Sea fisheries Development Board (Bord Iascaigh Mhara) since 2000. In this regard Michael is responsible for the delivery of the Sea-fisheries Programme of the National Development Plan and the Operational Programme of the EU in Ireland. Michael leads a of 44 staff split across five sections, which delivers financial, technical and resource development assistance to the catching sector in Ireland. Prior to his present role, he was employed as Fisheries Development Executive and Fisheries Development Officer at BIM since 1998. In this role he acted as secretary to the National Strategy Review Group on the Common Fisheries Policy. This Group reported extensively on all aspects of the CFP and Michael acted as principal author for these reports, which later formed the basis for much of Ireland's input to the review of the CFP in 2002. Between 1997 and 2000 Michael was a member of the EU Scientific, Technical and Economic Committee for Fisheries, while between 1999 and 2005 he was a member of the European Sustainable Use Specialist Group of the International Union for the Conservation of Nature (IUCN).

Prior to his current series of positions at BIM, Michael worked as a statistician and population modeller at the Fisheries Research Centre, Dublin between 1994 and 1998. During this time he was part of the Stock Assessment division specialising in statistics and population modeling. This period allowed Michael to develop a deep understanding of stock assessment techniques and he was, at various times, a member of a number of specialist working groups of the International Council for the Exploration of the Sea (ICES). Between 1991 and 1993 Michael was employed as a lecturer in zoology at Trinity College Dublin In this role Michael was responsible for preparation and delivery of lectures, laboratory practicals and annual examinations in comparative physiology, ecology and statistics for students of zoology and environmental science. During this period Michael developed a deep interest in statistics and population modeling

Expert team member: Luis Ambrosio

Primarily responsible for assessment under Principle 3.

Bachelor's Degree in Biology and graduate in fisheries and aquaculture. Currently Managing Director of the consulting firm Proyectos Biológicos y Técnicos sl (PROBITEC).

Since 1989 I also work as a consultant on fisheries, aquaculture and marine biosphere. I am part of the Spanish Technological Platform for Fisheries and Aquaculture (PTEPA) and I am a founding member of the Association for Sea Research (AIMARES).

I have developed working relationships with public and private corporations. I have undertaken specific jobs in, inter alia, extractive fishing of industrial and artisanal fleets, fisheries subsidies, certification, marketing and quality improvement of fishery products, labelling of fish products, environmental interactions and socioeconomic impact of fishing activity. In addition, I´ve been involved in international cooperation missions related to fisheries and aquaculture in different countries in Africa and Latin America, having performed sectorial assessments, project design, project evaluations and technical leadership in the implementation of some of them.

Furthermore, I have consolidated expertise in fisheries policy. I was coordinator of the Spanish White Paper on fisheries and aquaculture for the Spanish administration and coordinator for Spain OCEAN2012 Platform.

At present, I am an advisor on issues related to fisheries, aquaculture and marine protected areas for the Organization WWF and Special Consultant of the Latin American Organization for Fisheries Development (OLDEPESCA).

Replacement assessment team leader: Joseph DeAlteris

Primarily responsible for assessment under Principle 2.

Dr. Joseph DeAlteris retired from the University of Rhode Island (URI) in May of 2012, and was awarded Professor Emeritus status. In 30 of service to URI he is taught course work, conducted research, and developed outreach programs in fisheries conservation engineering, fish population dynamics and quantitative ecology, and shellfish aquaculture. He mentored more than 40 graduate students completing MS and PhD degrees. He has served on numerous US federal and state government committees and panels including the National Research Council. He has had more than 35 publications in peer-reviewed journals. In 2006 Dr. DeAlteris co-authored a seminal paper published in the Philippine Journal of Aquatic Science entitled "Size selectivity of purse seines in the Southern Philippines multi-species tuna fisheries". This paper utilized biological and catch data from the Philippine purse seine fisheries to input into a size selectivity and yield per recruit model that supported the rational approach to sustainability for these fisheries; in 2010 he co-authored a paper with a former graduate student entitled: "A simulation study of the effects of spatially complex population structure on Gulf of Maine cod" was selected as the best paper of the year by the American Fisheries Society in the North American Journal of Fisheries Management. He has also authored and co-authored numerous books, manuals, non-referred articles, and technical reports.

Dr. DeAlteris has a real world approach to fisheries having operated a successful commercial fishing business in the mid-Atlantic region from 1977 to 1983, and having participated in pot, dredge, longline, gillnet and trawl fisheries. Dr. DeAlteris is a retired naval officer, having served on submarines during the cold war and the Viet Nam era.

Dr. DeAlteris is President of DeAlteris Associates Inc. (DAI), a coastal and fisheries consulting firm that he formed in 1977. Most recently, DAI has conducted technology based projects with the National Marine Fisheries Service on reducing marine mammal and sea turtle interactions in trawl fisheries, stock assessment projects in Cape Verde for the World Bank, and Gambia, West Africa for USAID, and in the US northeast Atlantic for the deep-sea red crab fishery. Dr. DeAlteris has been involved with Marine Stewardship Council sustainability assessments for a finfish and shellfish fisheries in the US and Canada working for several different CABs. He is a MSC certified assessor and assessment team leader. He has completed the pre-assessment of numerous fisheries, full assessments of blue crab, deep-sea red crab, and halibut, annual audits of numerous fisheries, and several peer-reviews of assessment reports.

2.1.1 Peer Reviewers

Peer reviewers used for this report were Geoff Tingley and Don Aldous. A summary CV for each is available in the **Assessment downloads** section of the fishery's entry on the MSC website.

Justification as to why these particular peer reviewers were appointed:

Geoff Tingley

- 22 years' experience working in stock assessment and the management of marine and freshwater fisheries around the world; experience includes the scientific, management, licensing and policy issues of a diversity of fisheries.
- Fisheries sustainability management experience includes MSC certification and post-certification monitoring for a large number of fisheries, gear types and species, as assessor, pre-assessor and peer reviewer; has experience of being part of and also evaluating governmental fisheries management organisations, including membership of the South Atlantic Fisheries Commission (UK Delegation) from its inception in 1989 to 1996; in depth understanding and managing a number of fisheries-environment interactions, including by-catch, accidental catch of seabirds and sea bed interactions; MSC peer reviewer of Maldives Tuna fishery.

Don Aldous

- involved in fisheries management issues in Canada and the Pacific Islands since 1977; experience at all levels of fisheries management from Fishery Officer to Commissioner of a Regional Fisheries Management Organization; expertise in international tuna fishery preparing plans for both regional organizations and governments.
- extensive experience in dealing with regional issues of tuna management (Pacific) and liaising with regional tuna fora (South Pacific Forum Fisheries Agency); on a regional scale provided advice to FFA on issues related to fisheries management, development and MCS; conducted studies at the national level in the development of fisheries management strategies (tuna) which required working closely with various international and national government agencies in the collesence of objectives into a comprehensive plan; involved in leading consultation meetings with stakeholders in the industry, government and NGO's to explore options and prepare strategies; practical experience of MSC methodology and requirements as Principle 3 assessor.

2.1.2 RBF Training

Nick Pfeiffer has been fully trained (2013) in the use of the MSC's Risk Based Framework (RBF). The RBF was used for evaluating the impact of the fisheries on some non-target species retained in the fishery.

3. Description of the Fishery

3.1 Unit(s) of Certification and scope of certification sought

Food Certification International Ltd. confirms that the Echebastar Indian Ocean freeschool purse seine fishery which is reported on within this Report is within scope of the MSC certification sought for the assessment as defined.

Prior to providing a description of the fishery it is important to be clear about the precise extent of potential certification. The MSC Guidelines to Certifiers specify that the unit of certification is **"The fishery or fish stock (biologically distinct unit) combined with the fishing method / gear and practice (= vessel(s) and / or individuals pursuing the fish of that stock)"**.

This clear definition is useful for both clients and assessors to categorically state what was included in the assessment, and what was not. This is also crucial for any repeat assessment visits, or if any additional vessels are wishing to join the certificate at a later date.

The total number of units of certification for the fishery under consideration is six as published on the MSC web site, three related to tuna caught associated with FADs and three related to tuna caught using purse seines set on free-swimming schools ('free sets').

This report presents the findings of the assessment team only in relation to the following three Units of Certification that have currently progressed through scoring and into the reporting stages of the assessment process. These UoCs are based on purse seine sets made on freeschools of tuna – so called unassociated sets. In this context, sets made on drifting objects or drifting Fish Aggregating Devices (FADs) are excluded from this assessment report. These FAD related UoCs remain in assessment and will be the subject to a separate PCDR assessment report published in due course.

The UoCs of the fishery that have been assessed and are currently recommended for MSC certification are defined as:

UoC 1

Species:	Skipjack Tuna (*Katsuwonus pelamis*)
Stock:	Indian Ocean Stock
Geographical area:	FAO 51 & 57
Harvest method:	Purse Seine set on free-swimming schools (´free sets´).
Client Group:	Member vessels of Echebastar Group

UoC 2

Species:	Yellowfin *(Thunnus albacares)*
Stock:	Indian Ocean Stock
Geographical area:	FAO 51 & 57
Harvest method:	Purse Seine set on free-swimming schools (´free sets´).
Client Group:	Member vessels of Echebastar Group

UoC 3

Species:	Bigeye *(Thunnus obesus)*
Stock:	Indian Ocean Stock
Geographical area:	FAO 51 & 57
Harvest method:	Purse Seine set on free-swimming schools (´free sets´).
Client Group:	Member vessels of Echebastar Group

Please note that whilst the Unit of Certification details the full extent of what has being assessed so far, it is the full and complete Public Certification Report that precisely defines the exact nature of certified UoCs for this fishery.

These Units of Certification were used as they are compliant with client wishes for assessment coverage and in full conformity with MSC criteria and certification requirements.

3.2 Overview of the fishery

3.2.1 Pesqueras Echebastar S.A

Fishery Ownership

The client for this certification is Pesqueras Echebastar S.A. The assessment includes the catches of vessels owned and operated by Echebastar fleet (Spanish fleet) and Hartswater International (Seychelles fleet). Pesqueras Echebastar S.A. wholly owns both companies and the certification applies to Pesqueras Echebastar.

Pesqueras Echebastar is a family company that has been fishing tuna since 1967. The Echebastar name comprises elements of three Bermeo based Basque founding family names (Echebarria, Astorkiza and Arrien). The company headquarters are in Bermeo, a small village on the Basque coast of the Iberian Peninsula where the major part of the Spanish owned distant water tuna fleet is established.

History of the Fishery

Pesqueras Echebastar is a family company that has been fishing tuna since 1967. Initial operations were in the Atlantic Ocean, however due to increased competition for resources in that ocean, Pesqueras Echebastar first commenced operations in the Indian Ocean in 1981, shortly after the first French vessels arrived in the area. Since that time it has devolved itself from any operations in the Atlantic Ocean and nowadays all of its tuna purse seine activities take place in the Indian Ocean. In present days, Echebastar vessels only fish for tunas using purse seine fishing methods. In the early days, purse seine sets were made on freeschools of moving tunas and schools associated with natural floating objects such as logs, as well as schools associated with whales. These sets yielded catches of mainly yellowfin but also with some skipjack and bigeye bycatch. During the early 1990's, the first drifting Fish Aggregating Devices (FADs) were introduced in the Indian Ocean industrial tuna fisheries. Since that time, the use of FADs in the purse seine fishery has become extensive and catches of tunas associated with whales, floating objects and FADs now account for in excess of 80% of skipjack catches, as well as the majority of yellowfin and bigeye catches.

Despite the development of the FAD based fishery, Echebastar vessels still catch significant quantities of fish by targeting freeschools of tuna – those not associated with FADs or other floating objects including logs and/or whales. The present assessment report relates to Echebastars freeschool fishery operations only, and not FAD based operations (including natural logs).

As of 2013, the total registered fish hold capacity of the Echebastar Group vessels (Spanish and Seychellois registered) is 10,200t and this capacity is fixed by governments in both jurisdictions. This represents a reduction in capacity of 25% between 2003 - 2013. Echebastar is presently engaged in a major fleet renewal programme that will see three new purpose built tuna purse seine vessels enter service between 2012 and 2015. Existing vessels will be sold off to make way for new vessels and there will be no increase in capacity as a result of fleet renewal.

Organisational Structure

Pesqueras Echebastar S.A is a family owned business based in the Basque region of northern Spain. Pesqueras Echebastar owns three vessels included in the assessment certification. A second company Hartswater International is based in the Seychelles and is wholly owned by Pesqueras Echebastar.

Pesqueras Echebastar is managed by a board comprising five people, all of whom are members of one or other of the original founding families. Mr Kepa Etxebarria Elizondo – is the Apoderado (Chief Executive) and has been so since 2002.

Pesqueas Echebastar is a member of ANABAC – the Spanish National Association of Tuna Freezer vessels Shipowners. ANABACS mission is to defend the interests of the Basque tuna freezer purse-seine fleet, as well as the sustainability of the species caught. ANABAC is comprised of 5 companies located in Bermeo. Currently, a total of 28 vessels are associated to ANABAC and their activity is carried out in the tropical waters of the Atlantic Ocean (in the area of the Gulf of Guinea) and the Indian Ocean (from the East coast of Africa to the Chagos Islands). ANABAC in turn is a member of CEPESCA – the Spanish fishing industry federation.

As the fleet comprises distant water factory processing vessels that engage in extended fishing trips, Echebastar group maintain shore based support staff who are responsible for various aspects of the companies functioning, including sales and marketing, finance and accounting, negotiation and development of fishing opportunities as well as vessel operations management. Part of routine procedures includes on-going maintenance and updating of operational records and essential documentation that is associated with operating a compliant distant water fleet.

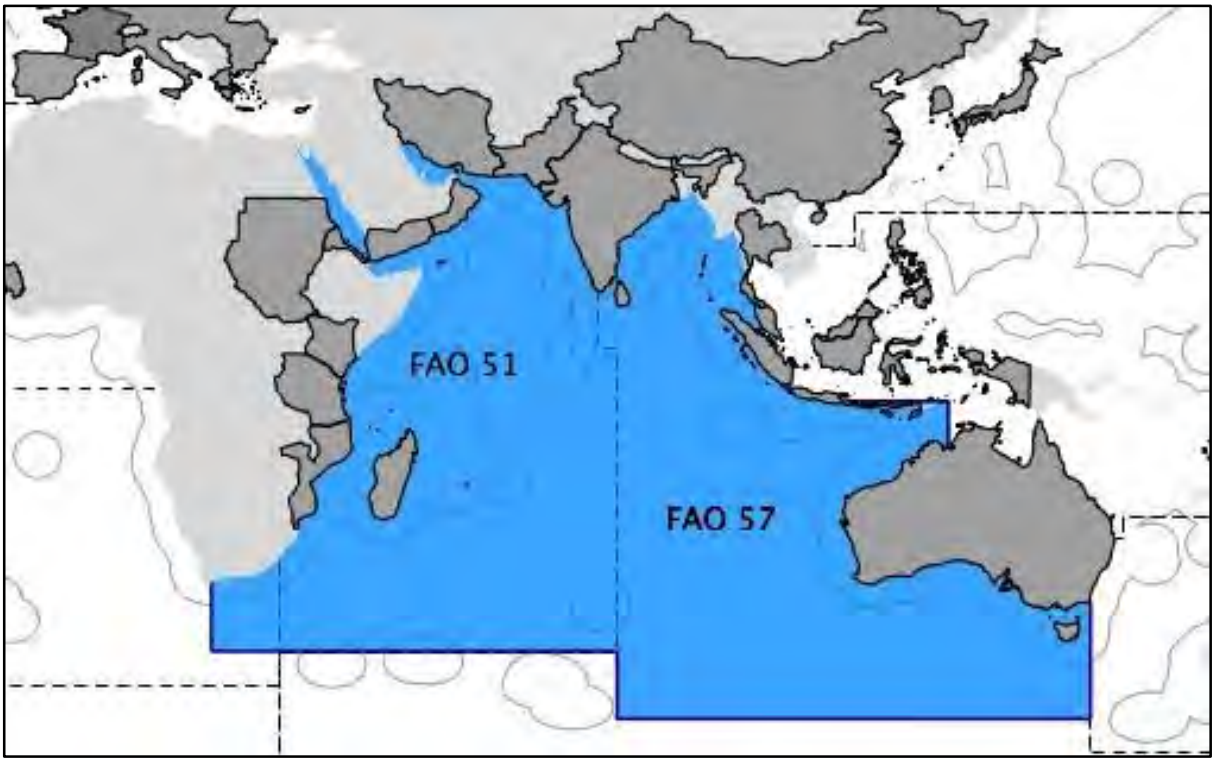
Management normally meet the vessel during the landing events that may take place every four to six weeks in Port Victoria, Seychelles during the fishing season in order to ensure on-going commitments with respect to operational procedures, legal obligations, health and safety and product quality are fulfilled. Other management functions such as ensuring that technical support and backup is provided in a timely manner and ensuring that any changes to fishing rules are captured and implemented by on-board management systems are also facilitated during regular on-board meetings between managers and vessel masters and skippers. Regular communication is maintained via satellite email and telephone communications during fishing trips.

On-board vessel management is provided by a vessel master who is responsible for all aspects of compliance and safety and who has overall responsibility for - and command - of the ship. A separate fishing skipper normally oversees fishing operations while there is also a processing manager or supervisor who is in charge of fish processing operations on-board.

Area Under Evaluation

The fisheries take place entirely within the Indian Ocean, within FAO areas 51 and 57. Most of the catches emanate from activities carried out in FAO area 51 (western Indian Ocean)

Figure 3.2.1 FAO statistical areas of the Indian Ocean



Source: FAO

3.2.2 Species and Fishing Practice

Species type/s

The target species for the fishery under certification are yellowfin tuna (*Thunnus albacores),* skipjack tuna (*Katsuwonus pelamis)* and bigeye tuna (*Thunnus obesus).* Further information in relation to the biology of each species is given in section 3.3. As indicated initially, this report does not intend to provide a scientifically comprehensive description of the species. Interested readers should refer to sources that have been useful in compiling the following summary description of the species.

These include:

» www.fishbase.org

» http://www.fao.org/fishery/species/2497/en

» http://www.fao.org/fishery/species/2494/en

» http://www.fao.org/fishery/species/2498/en

Management History

Recent management of highly migratory stocks in the Indian Ocean is agreed and implemented through the Regional Fisheries Management Organisation (RFMO) in the area of competence, which in this case is the Indian Ocean Tuna Commission (IOTC). Nearly all tuna fishing nations in the Indian Ocean are contracting parties to the IOTC, including the EU and Seychelles, to which this fishery belongs. The IOTC conducts a scientific assessment of the key tuna stocks every year or every other year (depending on priorities and data availability), and holds an annual plenary meeting where management decisions are taken. Implementation of these decisions is the responsibility of member nations. In this case the EU, and either Spain and/or the Seychelles must transpose IOTC agreed management measures into legally enforceable regulations for their respective fleets.

The IOTC was established in 1993 at the 105th Session of the Council of the Food and Agriculture Organization of the United Nations (FAO) under Article XIV of the FAO constitution. The IOTC Members can make decisions concerning the management of tuna and tuna-like resources, and their associated environment, that are binding on all Members and Co-operating non-Contracting Parties (CCPs). The Agreement was signed on November 25th 1993 and entered into force on March 27th 1996. The Financial Regulations of the IOTC were adopted at the organisation's First Special Session, held in Rome on March 21-24, 1997 and the IOTC Rules of Procedure were adopted at the Second Special Session, held in Victoria, Seychelles, on 22-25 September, 1997 (and updated in June 2014). Following the decision of the Members at the First Session, the Secretariat was established in Victoria, Republic of Seychelles, and became operational in January 1998.

Membership of IOTC is open to Indian Ocean coastal countries and to countries or regional economic integration organisations that are members of the UN or one of its specialised agencies, and are fishing for tuna in the Indian Ocean. There are currently 32 members, the majority of which are Nation States, although the interests of the European Indian Ocean tuna fleet are represented directly through the European Union.

Fishing Practices

Before 1979 tuna was fished in the Indian Ocean mainly with longlines and pole and lines, but purse seining for tuna expanded considerably during the first half of the 1980s. The bulk of the catch is composed of more or less equal amounts of yellowfin and skipjack tuna. A large proportion of the catch is taken by vessels from outside the region.

Pesqueras Echebastar utilises purse seine gears exclusively to catch target stocks of tuna. The majority of catches result from purse seine sets that are associated with floating objects including both natural objects (e.g. logs) and artificial devices (FADs), seamounts and whales. These purse seine technique account for the great majority (approaching 80%) of the overall catch of tunas – especially of skipjack tuna, which are otherwise difficult to catch by purse seine. In order to ensure that fishing using FADs remains efficient, it is common practice in the Indian Ocean nowadays for tuna fleets to maintain a vessel at sea exclusively for the purposes of deploying and maintaining FADs.

The present report however considers only Pesquera Echebastar's fishery for yellowfin, skipjack and bigeye tuna that is based on freeschool sets with purse seine gears. Freeschool sets are those that are made on schools of tuna that are not associated with anything else. Unassociated sets are specifically those that are not made on oceanic megafauna (whales), seamounts, or within several nautical miles of natural or artificial floating objects (FADs).

In order to locate suitable schools of fish to set upon, tuna seiners typically use look-outs based in a 'crows-nest' high above the water, to scan the waters for signs of tuna activity, indicated most frequently by ocean surface seabird activity. However vessels may also employ sensitive and sophisticated radar that is capable of detecting seabird activity at greater distances or during inclement weather or poor visibility, to aid in locating schools of tuna. Vessels also receive data in relation to oceanographic conditions (especially temperature and the location of ocean fronts) often from satellite derived sensing data to indicate likely discontinuities in ocean surface conditions. The association between tunas and ocean fronts is well known and the vessels use information in order to locate and remain with such ocean fronts. The majority of catches emanating from freeschool sets are of yellowfin tuna, although significant volumes of skipjack and bigeye tuna species may also be captured alongside yellowfin. A detailed account of the tuna purse seining process is available at http://www.fao.org/fishery/fishtech/40/en (FAO fishing practice description for tuna purse seining)

Table 3.2.1 List of Pesquera Echebastar member vessels

Name	Ownership	Registry	Vessel Reg. No.
Alakrana	Pesquera Echebastar	Spain	3ª BI-2-1-05
Campolibre	Pesquera Echebastar	Spain	BI-2-2869
Elai Alai	Pesquera Echebastar	Spain	BI-2-1-93
Demiku	Hartswater International (part of Pesquera Echebastar group)	Seychellois	SC/FV/005
Izaro	Hartswater International (part of Pesquera Echebastar group)	Seychellois	SC/FV/026

Source: Pesqueras Echebastar

All vessels operated by Echebastar group are large (75m+) ocean going purse seine vessels. Vessels are equipped for handling purse seine ear and for storing catches in super chilled sea water brine at temperatures down to -60C. Vessels may stay at sea for up to 30 days. All landings are made into Port Victoria, Seychelles and very occasionally fish may be landed into Spain directly when vessels may return for maintenance. Otherwise, vessels remain in the Indian Ocean and are based out of Port Victoria. Vessels are not equipped for processing at sea. An up to date vessel list can be obtained by contacting FCI using the following details:

MSC Fisheries Department

Contact Email: fisheries@foodcertint.com

Contact Tel: +44(0)1463 223 039 (FCI main number)

Historical Fishing Levels

A detailed account of overall historical fishing levels is provided for each stock in section 3.3.

In terms of Echebastar group, catch levels for recent years are summarized in Tables 3.2.2-3.2.6 below for freeschool and all sets combined.

Table 3.2.2 – Catch levels 2008

Vessel	YFT	SKJ	BET	ALB	Total by species
Alakrana	2,545	1,568	390	9	4,512
Campolibre Alai	668	313	359	7	1,346
Demiku	681	110	139	1	931
Elai Alai	1,384	460	144	44	2,031
Erroxape	1,313	761	113	0	2,186

Vessel	YFT	SKJ	BET	ALB	Total by species
Xixili	905	551	187	0	1,643
Total Freeschool sets	**7,496**	**3,762**	**1,331**	**61**	**12,649**
Total all sets	**12,422**	**20,047**	**3,863**	**63**	**36,423**

Source: Pesqueras Echebastar in the Indian Ocean for 2008

Table 3.2.3 – Catch levels 2009

Vessel	YFT	SKJ	BET	ALB	Total by species
Campolibre Alai	979	557	102	0	1,638
Demiku	943	1,198	400	0	2,540
Elai Alai	1,047	983	179	1	2,210
Erroxape	1,178	397	198	0	1,774
Xixili	1,434	296	164	18	1,912
Total Freeschool sets	**8,259**	**5,078**	**1,534**	**22**	**14,892**
Total all sets	**16,890**	**29,429**	**5,289**	**22**	**51,630**

Source: Pesqueras Echebastar tuna catches (t) in the Indian Ocean for 2009

Table 3.2.4 – Catch levels 2010

Vessel	YFT	SKJ	BET	ALB	Total by species
Alakrana	1,019	1,347	376	0	2,743
Campolibre Alai	945	771	112	36	1,863
Demiku	513	312	228	11	1,064
Elai Alai	621	291	59	0	971
Erroxape	466	99	65	0	630
Xixili	877	722	114	0	1,713
Total Freeschool sets	**4,440**	**3,543**	**954**	**47**	**8,984**
Total all sets	**18,397**	**32,688**	**4,671**	**50**	**55,820**

Source: Pesqueras Echebastar tuna catches (t) in the Indian Ocean for 2010

Table 3.2.5 – Catch levels 2011

Vessel	YFT	SKJ	BET	ALB	Total by species
Alakrana	2,714	564	253	26	3,556
Campolibre Alai	1,134	768	268	0	2,170
Demiku	868	781	206	5	1,859
Elai Alai	580	111	214	60	965
Erroxape	424	114	95	34	668
Xixili	1,187	549	143	0	1,878
Total Freeschool sets	**6,906**	**2,887**	**1,179**	**125**	**11,097**
Total all sets	**20,220**	**24,561**	**3,886**	**125**	**48,792**

Source: Pesqueras Echebastar tuna catches (t) in the Indian Ocean for 2011

Table 3.2.6 – Catch levels 2012

Vessel	YFT	SKJ	BET	ALB	Total by species
Alakrana	2,573	248	338	20	3,179
Campolibre Alai	580	183	205	23	991
Demiku	1,330	98	394	0	1,822
Elai Alai	1,263	35	200	2	1,499
Erroxape	1,745	35	148	0	1,927
Xixili	491	108	122	0	721
Total Freeschool sets	**7,982**	**707**	**1,407**	**45**	**10,140**
Total all sets	**20,996**	**16,063**	**3,238**	**63**	**40,361**

Source: Pesqueras Echebastar tuna catches (t) in the Indian Ocean for 2012

Other Resource Attributes and Constraints

The fishery has been spatially constrained in recent years due to the threat of piracy in the western Indian Ocean. Because of this the fleet do not operate within or close to the EEZ of Somalia. The target stocks are highly migratory and spend significant time within Somali waters, however they are not pursued there despite the vessels employing and carrying private security teams.

The Indian Ocean Dipole (IOD) phenomenon, also known as the Indian El Nino, is an irregular oscillation of sea-surface temperatures in which the western Indian Ocean becomes alternately warmer and then colder than the eastern part of the ocean. During IOD events, the western Indian Ocean will typically have above average sea surface temperatures, a deeper than average thermocline and lower than normal chlorophyll concentrations. The change in environmental conditions is believed to reduce overall productivity and amounts of available forage food, leading to unfavourable conditions for tunas in the surface layers. As a consequence, the catch rates of purse seine tuna fleets operating in the Western Indian Ocean may be significantly reduced during such events.

3.2.3 Administrative Framework

User Rights (Legal and Customary Framework)

The fishery takes place in the context of a well-developed legal framework. Spanish long distance fleets operate under EU and Spanish national fishery rules and regulations, which incorporate legally binding elements of the EU fisheries policy. An annually updated regulation is issued which applies to EU vessels fishing in third party waters. The Seychellois registered fleet is also subject to comprehensive fisheries legislation in the form of the Fisheries Act, 1991 which is the primary legislation. The Fisheries Act is supported by a range of regulations dealing with technical and management details of the fishery.

At an Indian Ocean level, management of highly migratory stocks is agreed and implemented through the Regional Fisheries Management Organisation (RFMO) for the region, which in this case is the Indian Ocean Tuna Commission (IOTC). Nearly all tuna fishing nations in the Indian Ocean are contracting parties to the IOTC, including the EU and Seychelles, to which this fishery belongs. The IOTC conducts a scientific assessment of the key tuna stocks every year or every other year (depending on priorities and data availability), and holds an annual plenary meeting where management decisions are taken. Implementation of these decisions is the responsibility of member nations. In this case the EU, and either Spain and/or the Seychelles must transpose IOTC agreed management measures into legally enforceable regulations for their respective fleets.

Membership of IOTC is open to Indian Ocean coastal countries and to countries or regional economic integration organisations that are members of the UN or one of its specialised agencies, and are fishing for tuna in the Indian Ocean. There are currently 32 Members, the majority of which are Nation States, although the interests of the European Indian Ocean tuna fleet are represented directly through the European Union.

Legal / Administrative Status

The fishery under assessment is legal, legitimate and takes place within the context, restrictions and limitations of the EU Common Fisheries Policy, Seychelles Sea Fisheries Act and all other relevant fishery management agreements, including IOTC agreed resolutions.

Involvement of Other Entities

IOTC is the RFMO whose area of competence includes the Indian Ocean and stocks of highly migratory species. Within the area, the fishery may operate in the EEZ of a number of countries including the Seychelles, Kenya, Madagascar as well as other nations. When operating in these areas, the vessels are subject to the rules of that jurisdiction as may be laid down in fishing agreements between the EU and those countries. Spain and the EU are responsible for management of Spanish registered vessels. The government of Seychelles is responsible for overseeing the activities of the Seychellois fleet.

The Seychelles Fishing Authority is responsible for collecting data in relation to landings in Port Victoria, Seychelles as well as in relation to transhipments in port. SFA is responsible for enforcement of regulations on Seychellois registered vessels, while Spanish authorities and the EU are responsible for enforcement of regulations on EU vessels.

3.3 Principle One: Target Species Background

Principle 1 of the Marine Stewardship Council standard states that:

A fishery must be conducted in a manner that does not lead to over fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Principle 1 covers all fishing activity on the entire target species stock - not just the fishery undergoing certification. However, the fishery under certification would be expected to meet all management requirements, such as providing appropriate data and complying with controls, therefore demonstrably not adding to problems even if the problems will not cause the certification to fail.

In the following section the key factors which are relevant to Principle 1 are outlined. The three Indian Ocean tuna stocks covered by the Principle 1 evaluation are skipjack tuna, yellowfin tuna and bigeye tuna. None of the three target species which are the focus of this assessment qualify as key low-trophic level species.

3.3.1 Skipjack tuna

3.3.1.1 Fisheries and catch trends

General

A recent IOTC paper, IOTC–2013–WPTT15–44, provides an overview of the statistics of the European Union (and associated flags) purse seine fishing fleet targeting tropical tunas in the Indian Ocean 1981-2012. Specifically for 2012, it notes that:

- the European Union's (and associated flags) purse seine fishing fleet of the Indian Ocean was composed of 37 vessels of individual carrying capacity >800 t, which all represented a total carrying capacity of more than 45,000 t.
- The total cumulated nominal effort was about 9,500 and 7,800 fishing and searching days, respectively.
- The total number of fishing sets was about 9,000, with about 5,600 realised on FAD-associated schools (62%).
- Overall, the capacity and nominal effort of the fleet has remained stable during recent years while total catches have dropped from more than 260,000 tonnes (2009-2011) to less than 230,000 tonnes in 2012. This is mainly explained by a combination of i) a major decrease in the number of sets per day and ii) catch rates of skipjack on FAD associated schools. The catch of skipjack per positive set is the lowest observed since 1984, (15 tonnes/set).

Catches

Catches of skipjack tuna worldwide have been steadily increasing since 1950, reaching a peak in 1991 at 1,674,970 t. In 1995, catches for this species have been reported from 15 fishing areas (practically all except the 4 fishing areas covering the Arctic and Antarctic regions).

The reported world catch reported for FAO Statistics in 1996 was 104551 t.

Skipjack tuna is taken at the surface, mostly with purse seines and pole-and-line gear but also incidentally by longlines. Other (artisanal) gear include gillnets, traps, harpoons and beach seines. Tuna pole and line fishing and Tuna purse seining are the most used fishing techniques. The importance of flotsam or manmade aggregation devices has increased greatly in recent years. Furthermore, supporting exploration techniques such as aerial spotting find increasing application in skipjack fisheries and utilization of remote sensing is being tried experimentally. In the pole-and-line/bait boat fishery, availability of suitable bait-fish presently represents one of the major constraints and hence, efforts to culture bait-fishes are receiving more attention [IOTC–2013–WPTT15–R[E].

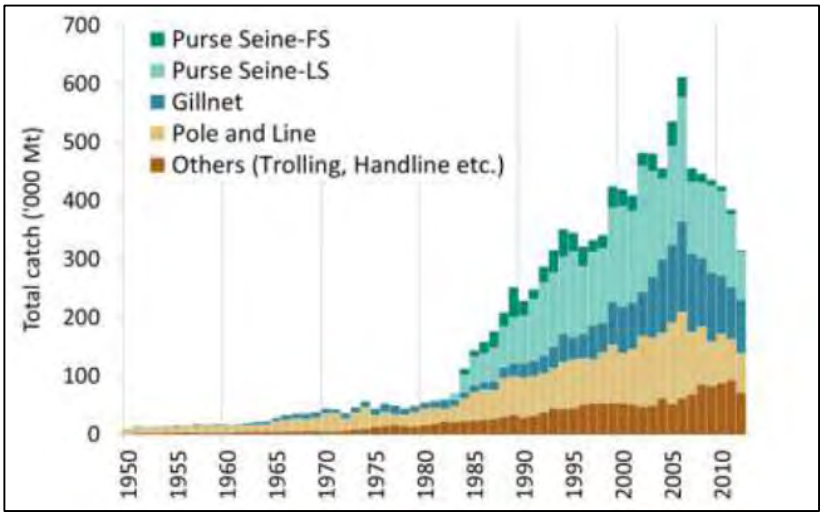
Catches of skipjack tunas reported by IOTC increased slowly from the 1950s, reaching around 50,000 t during the mid-1970s, mainly due to the activities of fleets using pole-and-lines and gillnets. The catches increased rapidly with the arrival of purse seine vessels in the early 1980s, and skipjack tuna became one of the most important commercial tuna species in the Indian Ocean. Annual catches peaked at over 600,000 t in 2006. Though preliminary, the catch levels estimated for 2012, at around 315,000 t, represent the lowest catches recorded since 1998.

The increase in skipjack tuna catches by purse seine vessels is due to the development of a fishery in association with Fish Aggregating Devices (FADs). In recent years, over 90% of the skipjack tuna caught by purse seine vessels is taken from around FADs. Catches by purse seine vessels increased steadily since 1984 with the highest catches recorded in 2002 and 2006 (>240,000 t). The catches dropped in the years 2003 and 2004, probably as a consequence of high purse seine catch rates on free schools of yellowfin tuna during those years. In 2007 purse seine catches declined about 100,000 t, from those taken in 2006. The constant increase in catches and catch rates by purse seine vessels until 2006 are believed to be associated with increases in fishing power and in the number of FADs (and the technology associated with them) used in the fishery. The sharp decline in purse seine catches since 2007 coincided with a similar decline in the catches by Maldivian baitboats (pole-and-line).

Table 3.3.1Skipjack tuna: Annual catches of skipjack tuna by gear (1950–2012) (Data as of September 2013).

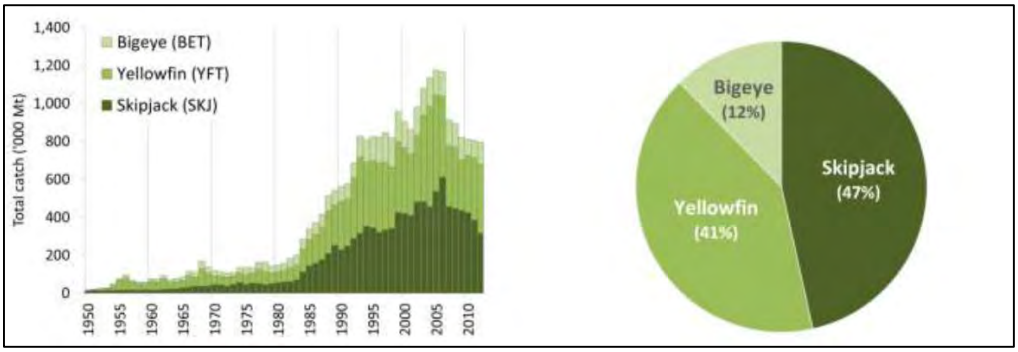
	1950s	1960s	1970s	1980s	1990s	2000s
Pole-and-Line	10,007	15,148	24,684	41,705	77,079	109,081
Purse seine free-school	0	0	41	15,253	30,598	25,868
Purse seine associated school	0	0	125	34,472	124,032	163,656
Other gears	4,999	11,712	21,952	38,281	87,731	174,498
Total	**15,006**	**26,860**	**46,801**	**129,712**	**319,440**	**473,102**

Figure 3.3.1Skipjack tuna: Annual catches of skipjack tuna by gear (1950–2012) (Data as of September 2013).



Source: IOTC

Figure 3.3.2: Contribution of the three tropical tuna species under the IOTC mandate to the total catches of IOTC species in the Indian Ocean, over the period 1950–2012. Left: nominal catch of each species, 1950–2012. Right: share of tropical tuna catch by species, 2009–12).



Source: IOTC

The Maldivian fishery has effectively increased its fishing effort with the mechanisation of its pole-and-line fleet since 1974, including an increase in boat size and power and the use of anchored FADs since 1981. Skipjack tuna represents some 80% of its total catch, and catch rates regularly increased between 1980 and 2006, the year in which the maximum catch was recorded for this fishery (≈140,000 t). The catches of skipjack tuna have declined since, with catches in recent years estimated to be at around 55,000 t, representing less than half the catches taken in 2006 and just 58% of the total catches of tropical tunas. In 2011 and 2012 Maldives reported high catches of yellowfin tuna following the development of handline fisheries for yellowfin tuna in the Maldives.

Several fisheries using gillnets have reported large catches of skipjack tuna in the Indian Ocean (Table 3.3.1), including the gillnet/longline fishery of Sri Lanka, driftnet fisheries of I.R. Iran and Pakistan, and gillnet fisheries of India and Indonesia. In recent years gillnet catches have represented as much as 20 to 30 % of the total catches of skipjack tuna in the Indian Ocean. Although it is known that vessels from I.R. Iran and Sri Lanka have been using gillnets on the high seas in recent years, reaching as far as the Mozambique Channel, the activities of these fleets are poorly understood, as no time-area catch-and-effort series have been made available for those fleets to date.

The majority of the catches of skipjack tuna originate from the western Indian Ocean. Since 2007 the catches of skipjack tuna in the western Indian Ocean have dropped considerably, especially in areas off Somalia, Kenya, Tanzania and around the Maldives. The drop in catches are considered by the SC to be partially explained by the drop in catch rates and fishing effort by some fisheries due to the effects of piracy in the western Indian Ocean region, including all industrial purse seine fleets, as well as those using driftnets from I.R. Iran and Pakistan; and the drop in the catches of skipjack tuna by Maldives bait-boats following the introduction of hand-lines to target large specimens of yellowfin tuna.

Retained catches are generally well known for the industrial fisheries but are less certain for many artisanal fisheries, notably because: i) catches are not being reported by species and ii) there is uncertainty about the catches from some significant fleets including the coastal fisheries of Sri Lanka, Comoros and Madagascar.

» Discard levels are believed to be low although they are unknown for most industrial fisheries, excluding industrial purse seine vessels flagged to EU countries for the period 2003–07.

» Changes to the catch series: There have been no major changes to the catches of skipjack tuna, as a whole, since the WPTT in 2012. However, the IOTC Secretariat used new information compiled during 2012–13 to rebuild the catch series for the coastal fisheries operated in some countries, in particular Indonesia and India. In general, the new catches of skipjack tuna estimated by the IOTC Secretariat are lower than those used in the past by the WPTT. [IOTC–2013–WPTT15–07 Rev_1].

» CPUE Series: Catch and effort data are available from various industrial and artisanal fisheries. However, these data are not available from some important fisheries or they are considered to be of poor quality for the following reasons: i) insufficient data available for the gillnet fisheries of I.R. Iran and Pakistan ii) the poor quality effort data for the gillnet/longline fishery of Sri Lanka, and iii) no data are available from important coastal fisheries using hand and/or troll lines, in particular Indonesia, India and Madagascar.

3.3.1.2 Biology

Habitat and Biology

An epipelagic, oceanic species with adults distributed roughly within the 15° C isotherm (overall temperature range of recurrence is 14.7° to 30°C), while larvae are mostly restricted to waters with surface temperatures of at least 25°C. Aggregations of this species tend to be associated with convergences, boundaries between cold and warm water masses (i.e. the polar front), upwelling and other hydrographical discontinuities. Depth distribution ranges from the surface to about 260 m during the day, but is limited to near surface waters at night.

Skipjack tuna spawn in batches throughout the year in equatorial waters, and from spring to early fall in subtropical waters, with the spawning season becoming shorter as distance from the equator increases. Fecundity increases with size but is highly variable, the number of eggs per season in females of 41 to 87 cm fork length ranging between 80 000 and 2 million. Food items predominantly include fishes, crustaceans and molluscs. Even though Carangidae and Balistidae are part of the diet of skipjack tuna in all oceans, the wide variety of species taken suggest it to be an opportunistic feeder preying on any forage available. The feeding activity peaks in the early morning and in the late afternoon. Cannibalism is common. The principal predators of skipjack are other tunas and billfishes.

It is hypothesized that the skipjack tuna in the eastern central Pacific originate in equatorial waters, and that the pre-recruits (up to 35 cm fork length) split into a northern group migrating to the Baja California fishing grounds, and a southern group entering the central and south American fishing areas. Having remained there for several months, both groups return to the equatorial spawning areas. A similar migration pattern has been observed in the north western Pacific.

Studies of the local movements of skipjack tuna showed that small fish (under 45 cm fork length) made nightly journeys of 25 to 106 km away from a bank but returned in the morning, while big individuals moved around more independently. Skipjack tuna exhibit a strong tendency to school in surface waters. Schools are associated with birds, drifting objects, sharks, whales or other tuna species and may show a characteristic behaviour (jumping, feeding, foaming, etc.).

Longevity

In the absence of reliable age determination methods, estimates of longevity vary at least between 8 and 12 years.

Growth & Average Maximum Size

Maximum fork length is about 108 cm corresponding to a weight of 32.5 to 34.5 kg; common to 80 cm fork length and a weight of 8 to 10 kg. The all-tackle angling record is an 18.93 kg fish with a fork length of 99 cm taken in Mauritius in 1982. Fork length at first maturity is about 45 cm.

3.3.1.3 Stock Status

- No new stock assessment was carried out for skipjack tuna in 2013. However previous results suggest that the stock is not overfished (B>BMSY) and that overfishing is not occurring (C<MSY and F<FMSY).
- Spawning stock biomass is estimated to have declined by approximately 45 % in 2011 from unfished levels. Total catch has continued to decline with 314,537 tonnes landed in 2012, in comparison to 384,537 tonnes in 2011.
- Based on the stock assessment carried out in 2012, the stock was considered to be not overfished and not subject to overfishing (Table 3.3.2). [IOTC–2013–WPTT15–R[E]

The recent declines in catches from this stock are thought to be caused by a recent decrease in purse seine effort as well as a decline in CPUE of large skipjack tuna in the surface fisheries. There remains considerable uncertainty in the assessment, and the range of runs analysed illustrate a range of stock status to be between 0.73–4.31 of SB_{2011}/SB_{MSY} based on all runs examined.

The WPTT does not fully understand the recent declines of pole-and-line and purse seine catch and CPUE, which may be due to the combined effects of the fishery and environmental factors affecting recruitment or catchability.

Catches in 2010 (424,013 t), 2011 (384,537 t) and 2012 (314,537 t) as well as the average level of catches of 2008–2012 (400,980 t) are below MSY targets though may have exceeded them in 2005 and 2006.

The Kobe strategy matrix illustrates the levels of risk associated with varying catch levels over time and could be used to inform management actions. Based on the SS3 assessment conducted in 2011, there is a low risk of exceeding MSY-based reference points by 2020 if catches are maintained at the current levels (< 20 % risk that $B_{2019} < B_{MSY}$ and 30 % risk that C_{2019}>MSY as proxy of $F > F_{MSY}$) and even if catches are maintained below the 2005–2010 average (500,000 t) based on the analysis done in 2011 (the 2012 reference point indicates that 500,000 t levels maybe too high for the Indian Ocean skipjack tuna stock).

The following key points should be noted:

- The mean estimates of the Maximum Sustainable Yield for the skipjack tuna Indian Ocean stock is 478,190 t (Table 3.3.2) and considering the average catch level from 2008–2012 was 400,980 t, the stock appears to be in no immediate threat of breaching target and limit reference points.
- If the recent declines in effort continue, and catch remains substantially below the estimated MSY, then urgent management measures are not required. However, recent trends in some fisheries, such as Maldivian pole-and-line and purse seine fishery, suggest that the situation of the stock should be closely monitored with a new stock assessment to be carried out in 2014.
- The Kobe strategy matrix illustrates the levels of risk associated with varying catch levels over time and could be used to inform management actions.

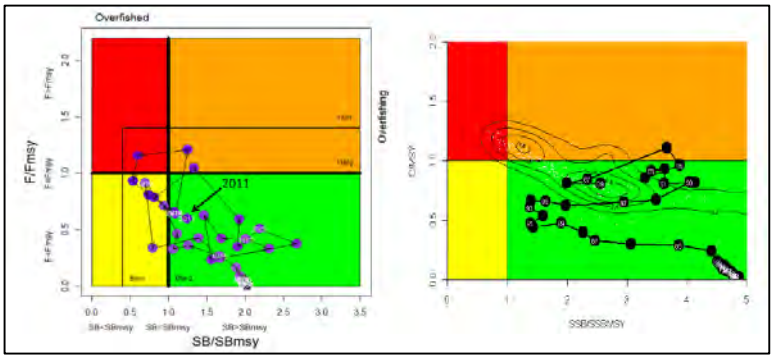
Provisional reference points: Noting that the Commission in 2013 agreed to Resolution 13/10 on interim target and limit reference points and a decision framework, the following should be noted:

- Fishing mortality: Current fishing mortality is considered to be below the provisional target reference point of F_{MSY}, and therefore below the provisional limit reference point of $1.5*F_{MSY}$.
- Based on the current assessment there is a very low probability that the limit reference points of $1.5*F_{MSY}$ at the current catch levels will be exceeded in 3 or 10 years.
- Biomass: Current spawning biomass is considered to be above the target reference point of SBMSY, and therefore above the limit reference point of $0.4*SB_{MSY}$.
- Based on the current assessment, there is a low probability that the spawning stock biomass, at the current catch levels, will be below the limit reference point of $0.4*SB_{MSY}$ in 3 or 10 years.

Kobe Plot:

The Kobe Plot shows stock status in relation to both spawning biomass (B) and fishing mortality rate (F) relative to Maximum Sustainable Yield (MSY).

Figure 3.3.3: Plot black circles indicate the trajectory of the weighted median of point estimates for the SB ratio and C/MSY ratio for each year 1950–2009.



Source: IOTC

Note that probability distribution contours are provided only as a rough visual guide of the uncertainty (e.g. the multiple modes are an artefact of the coarse grid of assumption options), and that because of numerical problems in the FMSY calculations, the proxy reference point C/MSY is reported instead of F/FMSY, which should be interpreted with caution.

Table 3.3.2 Skipjack tuna stock status for 2013.

Management Quantity	Aggregate Indian Ocean
2012 catch estimate	314,537 t
Mean catch from 2008–2012	400,980 t
MSY (95% CI)	478,190 t (358,900–597,500 t)
Data period used in assessment	1950–2011
F_{2011}/F_{MSY} (95% CI)	0.80 (0.68–0.92)
B_{2011}/B_{MSY}	–
SB_{2011}/SB_{MSY} (95% CI)	1.2 (1.01–1.43)
B_{2011}/B_0	–
SB_{2011}/SB_0 (95% CI)	0.45 (0.25–0.65)
$B_{2011}/B_{1950,\ F=0}$	–
$SB_{2011}/SB_{1950,\ F=0}$	0.45 (0.25–0.65)

Source: IOTC

In considering stock status it is also prudent to consider stock biomass in relation to both the point at which recruitment might be impaired as well as the target stock level. Concerning the point at which recruitment might be impaired it is difficult, if not impossible, to determine unless it has already been breached. In the case of bigeye tuna however there is no evidence for recruitment impairment.

Concerning the target stock level, and noting that while B_{MSY}, B_{2010}, and B_0 are unknown, both SB_{2011}/SB_{1950} (=SB_0) = 0.45 [0.25 – 0.665] and SB_{2011}/SB_{MSY} = 1.2 [1.01– 1.43] have been determined. Based on these values the best estimate of SB_{MSY}/SB_0 is 0.375 Resolution 13/10 provides that B_{LIM} = 0.40 B_{MSY} implying an SB_{LIM}/SB_0 of 0.15. Noting CB2.3.3.4, a value of 0.20 might be more prudent. However, even against this more conservative (but consistent with CB2.3.3.4) standard the base case median estimate of SB relative to its unfished state is 0.45 [0.25 - 0.65], where even the lower 95% confidence bound is well above the default value of 0. 20. Therefore, taking account of the uncertainty associated with the base case status estimates, there is a high degree of certainty (i.e. greater than 95%, as set out in MSC CR CB2.2.1.3) that the stock is above the point where recruitment would be impaired – the default value for this being around 50% of the BMSY level.

The current estimate of SB_{2012}/SB_{MSY} is 1.2 [1.01– 1.43]. Based on the SS3 assessment, there is a low risk of exceeding MSY-based reference points in 2020 if catches are maintained at 2009 (19 % risk that

SB2020 < SBMSY and 31% risk that C2020>MSY). Hence there is a "high degree of certainty" that the stock has been above the MSY reference points in recent years.

Table 3.3.3 Risks of exceeding interim reference points at different catch level projections

Reference point and projection timeframe	Alternative catch projections (relative to 2009) and weighted probability (%) scenarios that violate reference point				
	60% (274,000 t)	80% (365,000 t)	100% (456,000 t)	120% (547,000 t)	140% (638,000 t)
$SB_{2013} < SB_{MSY}$	<1	5	5	10	18
$C_{2013} > MSY$ (proxy for F_{2009}/F_{MSY})	<1	<1	31	45	72
$SB_{2020} < SB_{MSY}$	<1	5	19	31	56
$C_{2020} > MSY$ (proxy for F_{2009}/F_{MSY})	<1	<1	31	45	72

Source: IOTC

3.3.1.4 Reference Points

In resolution 13/10 the IOTC adopted interim target (B_{MSY} and F_{MSY}) and limit (B_{LIM} = 0.40 B_{MSY} and F_{LIM} = 1.50 F_{MSY}) reference points for skipjack tuna. The resolution specifies that the IOTC Scientific Committee should assess stocks against these reference points and provide advice against them, as is done both in tabular form and using Kobe process presentations. The resolution also calls on the Scientific Committee to further investigate reference points and Harvest Control Rules (HCR) using Management Strategy Evaluation (MSE). Stock assessments for skipjack are well advanced (see IOTC–2012–WPTT14) and though results are uncertain the influence of alternative assumptions and model approaches is explored.

The target reference points for this stock have been set as ratios: B/B_{MSY} and F/F_{MSY}. This is reasonable and consistent with practice elsewhere as well as with MSC requirements. The reference points are estimated based on MSY and are appropriate for tuna stocks. MSY is estimated within the stock assessment and reported to the management system. The relation of the stock relative to MSY is reported as part of the determination of stock status.

Resolution 13/10 sets interim target (B_{MSY} and F_{MSY}) and limit (B_{LIM} = 0.40 B_{MSY} and F_{LIM} = 1.50 F_{MSY}) reference points for skipjack tuna. No rationale is available to support these choices. Concerning the target stock level, and noting that while for skipjack tuna neither B_{MSY}, B_{2011}, nor B_{1950} (=B_0) are known, both SB_{2011}/SB_{1950} (=SB_0) = 0.45 [0.25 – 0.665] and SB_{2011}/SB_{MSY} = 1.2 [1.01– 1.43] have been determined. Based on these values the best estimate of SB_{MSY}/SB_0 is 0.375 Resolution 13/10 provides that B_{LIM} = 0.40 B_{MSY} implying an SB_{LIM}/SB_0 of 0.15. Noting CB2.3.3.4, a value of 0.20 might be more prudent. Although the IOTC has yet to adopt a specific limit reference point, management advice is provided relative to MSY as a target. The default 50% BMSY is assumed here for purposes of defining stock status. However, the lack of a well-defined point indicates that the SG80 is not met.

The implied B_{lim} of 15%B_0 is below the default certification requirement of 20% B_0. There is, however, no indication of impaired recruitment to date. The reference points in use are interim and work is planned to refine them using MSE to evaluate reference points and HCR. Clearly the intention of the IOTC (management response) and the basis on which scientific advice is supplied is to maintain the stock at or above the MSY level.

3.3.1.5 Harvest Strategy

In resolution 12/01 the IOTC agrees to apply the precautionary approach, in accordance with relevant internationally agreed standards, in particular with the guidelines set forth in the UNFSA, and to ensure the sustainable utilisation of fisheries resources as set forth in Article V of the IOTC Agreement. Further, in applying the precautionary approach, the IOTC has agreed:

1. That the Commission shall adopt, after due consideration of the advice supplied by the IOTC Scientific Committee, a) stock-specific reference points (including, but not necessarily limited

to, target and limit reference points), relative to fishing mortality and biomass, and b) associated harvest control rules, that is, management actions to be taken as the reference points for stock status are approached or if they are breached.

2. That reference points and harvest control rules shall be determined so that, according to the best available science, the risk of a negative impact on the sustainability of Indian Ocean resources of tuna and tuna-like species is minimised.
3. That in the determination of appropriate reference points and harvest control rules, consideration must be given to major uncertainties, including the uncertainty about the status of the stocks relative to the reference points, uncertainty about biological, environmental and socio-economic events and the effects of fishing activities on non-target and associated or dependent species.
4. That if an unanticipated event, such as a natural phenomenon has a significant adverse impact on the status of a stock or its associated environment, the Commission shall adopt Conservation and Management Measures on an emergency basis to ensure that fishing activity does not exacerbate such adverse impacts.
5. That initially and as an interim measure, the Commission may adopt provisional reference points and harvest control rules, taking into account the advice of the IOTC Scientific Committee; such measures would remain current until such time as the Commission chooses to update them.
6. That it will instruct the IOTC Scientific Committee to assess, through the management strategy evaluation process, the performance of reference points, including any interim reference points, and of potential harvest control rules to be applied as the status of the stocks approaches the reference points.
7. And that after completion of the management strategy evaluation, the IOTC Scientific Committee should provide the Commission with recommended reference points for all major stocks, and cast future advice on the status of the stocks relative to the adopted reference points, on the basis of the best available scientific evidence.
8. Finally, that the IOTC Scientific Committee will report on the progress of the management strategy evaluation process

Given that resolution 13/10 **has set** interim target (B_{MSY} and F_{MSY}) and limit (B_{LIM} = 0.40 B_{MSY} and F_{LIM} = 1.50 F_{MSY}) reference points, then resolution 12/01 may be taken to provide context for an overall harvest strategy including the intention that management responses ultimately be guided by HCRs once determined using MSE. For example, the 12/01 framework specifies that consideration must be given to major uncertainties, including the uncertainty about the status of the stocks relative to the reference points, uncertainty about biological, environmental and socio-economic events and the effects of fishing activities on non-target and associated or dependent species and that if an unanticipated event, such as a natural phenomenon has a significant adverse impact on the status of a stock or its associated environment, the Commission shall adopt Conservation and Management Measures on an emergency basis to ensure that fishing activity does not exacerbate such adverse impacts.

In addition IOTC Recommendation 14/07 (to standardise the presentation of scientific information in the annual scientific committee report and in working party reports), sets out a framework for reporting uncertainty around estimates. Specifically it provides that, in support of the scientific advice made available by the IOTC Scientific Committee, the 'Executive Summaries' within the annual IOTC Scientific Committee report which present stock assessment results, include when possible, a Kobe plot/chart showing any Target and Limit Reference Points adopted by the Commission; the stock estimates, expressed in reference to Target Reference Points adopted by the Commission; the estimated uncertainty around estimates, provided that statistical methods to do so have been agreed upon the Scientific Committee and that sufficient data exist; and the stock status trajectory.

The overall effect, therefore, of resolutions 12/01, 13/10 and 14/07 is to provide interim elements of the final harvest strategy that are clearly intended to ensure that the stock is maintained around the target reference points (B_{MSY} and F_{MSY}). In that sense then, the intention of the resolutions are consistent with

appropriate management; they provide a framework that is well known from other fisheries where it has proven effective. There is no reason to believe that it would be any less effective here if strictly applied.

Similarly, scientific advice has been formulated relative to a harvest strategy which is, in turn, relative to MSY reference points. This is responsive to that state of the stock and to limit and target reference points commonly used for tropical tunas.

And while the strategy is not clearly defined but, rather is "implied" and while it is not clear whether the harvest strategy will be successful in all circumstances, it is none the less apparent from the report of the WPTT that while the harvest strategy may not have been fully tested, monitoring is in place. Further, it is evident from the most recent assessment that for this stock a) the catch is below MSY, b) the stock is NOT overfished. This indicates that overall controls on the exploitation of this stock have been adequate to date and the harvest strategy is achieving its objectives. This meets the SG80. That being said, and in the absence of direct evidence or the results of a full MSE, there is not specific evidence that the harvest strategy will work in practice under different circumstances: that is, it has not be full evaluated.

Further while there is no pre-agreement on how to react to stock changes and stock assessments required to evaluate management performance are not frequent - given the stock is heavily exploited. It has yet to be shown that the management system can maintain stock at the target level (B>BMSY, F<FMSY). Thus the stock does not meet the SG100

Conversely at paragraph 4 of IOTC resolution 13/10, the interim framework provides guidance on management aims if target reference points are breached. These require that the IOTC Scientific Committee develop and assess potential harvest control rules. And while this work is ongoing, and final HCRs do not therefore yet exist, the objectives of the management strategy are established. These are set out in paragraph 4 of resolution 13/10 as follows:

HCRs will take account of the following objectives:

- For stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant;
- For stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible;
- For stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible;

For stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible

The work of the WPTT provides clear evidence that monitoring of this stock is adequate to determine whether the harvest strategy is working. The different parts of the strategy include maintaining both B/B_{MSY} and F/F_{MSY}. Data are collected to estimate these quantities and updates and assessments conducted. The latter reports best estimates of biomass, which indicates whether management is achieving its objectives or not. That being said there is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible.

3.3.1.6 Harvest Control Rules & Tools

Whereas the overall effect of resolutions 12/01 and 13/10 is to provide interim elements of the final harvest strategy that are clearly intended to ensure that the stock is maintained around the target reference points (B_{MSY} and F_{MSY}) the strategy is not fully specified. Further, and noting that Harvest Control Rules are a separate component of any harvest strategy, again Harvest Control Rules are implied rather than explicitly specified. In other words the interim framework does lay out general management aims. It does this by agreeing its *intention* that the IOTC Scientific Committee **will** recommend to the Commission HCRs, which among other factors, taking account of the following objectives:

- For stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant;

» For stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible;

» For stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible;

» For stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible.

Though poorly defined in its current form, resolution 13/10 none-the-less can be said provide a framework that is well known from other fisheries where it has proven effective. Therefore on that basis, then, it must be concluded that there are "generally understood harvest control rules in place consistent with the harvest strategy".

Apart from clearly defined HCRs, an effective management strategy must also have in place effective tools that ensure effective implementation of any decision taken as part of strategy whether catch or effort limits, closed areas, technical conservation measures etc. Currently the tools provided in respect of big eye include:

» Resolution 13/03 on the recording of catch and effort by fishing vessels in the IOTC area of competence

» Resolution 13/07 concerning a record of licensed foreign vessels fishing for IOTC species in the IOTC area of competence and access agreement information

» Resolution 13/10 On interim target and limit reference points and a decision framework

» Resolution 13/11 On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna and a recommendation for non-targeted species caught by purse seine vessels in the IOTC area of competence

» Resolution 12/11 on the implementation of a limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties

» Resolution 12/13 for the conservation and management of tropical tunas stocks in the IOTC area of competence.

» Resolution 10/02 mandatory statistical requirements for IOTC Members and Cooperating non-Contracting Parties (CPC's) Resolution 10/08 concerning a record of active vessels fishing for tunas and swordfish in the IOTC area

And while it is not entirely clear if these measures are adequate to fully implement and enforce an effective harvest strategy, with the stock moving towards the biomass target reference point adopted in resolution 13/10, (B/ B_{MSY}), it is evident that IOTC has started to investigate and develop other steps to control fishing. These include:

» An ongoing process to develop a catch allocation scheme based on already developed allocation principles. IOTC-2011-SS4-Prop A[E], IOTC-2011-SS4-Prop B[E], IOTC-2013-TCAC02-R[E]) clearly demonstrate the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction. This is further emphasised by IOTC RES 12/13 which explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ.

» Explicit HCRs for skipjack are currently under development using a well-specified MSE approach.

It is also the case that

» IOTC has demonstrated the technical ability to implement spatial/temporal closures.

» IOTC RES12/11 is aimed at determining fishing capacity for all IOTC Contracting Parties and Cooperating Non-Contracting Parties, and ensuring that capacity is not increased. The effectiveness of the provision is due for consideration in 2014.

Collectively these provide evidence that the IOTC intends to implement HCRs once fully developed. Further, various tools are in place or are being developed. The likely tools to be put in use when needed

include spatial and temporal closures to improve exploitation pattern and quotas allocated between states. These tools are proven to be effective in other settings if implemented appropriately.

In summary, harvest control rules for this stock are not well-defined and there is no specific plan of control if the stock size falls below the trigger point (MSY). There is, however, evidence of an intention to end overfishing and rebuild this stock should depletion occur and the scientific committee is called on to provide such advice. Therefore there are generally understood harvest rules in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached. However these are neither well defined nor have they been tested to ensure that the exploitation rate is reduced as limit reference points are approached.

As the current, interim, framework does not include well defined harvest control rules or specific guidance on management it then it cannot be said that selection of the harvest control rules takes into account the main uncertainties.

As the biomass of this stock has, to date, remained above the target reference point there has not been any occasion where a level of control to respond to excess fishing pressure however has been demonstrated. However the tools that the IOTC have available include TACs, area access and other measures. The IOTC has begun to develop allocation mechanisms for both TACs and access agreements and the Scientific Committee has initiated the process of control rule development. There is some evidence that some IOTC members have controlled their own catches in an effective manner. Nevertheless, there are as of yet no harvest control rules at the IOTC level and, thus, no evidence that the tools are effective.

Note: Following the MSC Notice, “Scoring of ‘available’ Harvest Control Rules (HCRs) in CRv1.3 fisheries” of 24th November, PI 1.2.2 SI a and c are scored using CR v2.0 provisions for SG60 scoring. The notice provides for scoring using CR v2.0 at 1.2.2a and c, but is aimed at avoiding ‘incorrect interpretation’ at CR v1.3 PI 1.2.2c. It is also aimed at ensuring consistency between assessments that are being harmonized (as is this assessment).

CR v2.0 scoring guidance is provided at SA2.5.2 that includes conditions for use of CR v2.0 when generally understood HCRs are considered to be available but not actually in place. The basis for SG60 scoring at PI 1.2.2a is that generally understood HCR are in place in this fishery – specifically through adoption of IOTC Res 13/10. Conditions for use of CR v2.0 laid out at SA2.5.2 are therefore not relevant in this case.

At CR v2.0 GSA2.5 it is clear for SG60 scoring that “HCRs should be likely to ensure that stocks will be maintained above the PRI”. At PI 1.1.2 SI (b), above, it is noted the IOTC has implicitly adopted an interim LRP of 12.4% B0 but without justification. For the purposes of this assessment, and consistent with comments at PI 1.1.2 SI (b), the PRI is assumed to be 20% B0, consistent with MSC CR v1.3 CB2.3.3.4 and MSC CR v2.0 GSA2.2.3.

Resolution IOTC RES 13/10 specifies interim MSY-related TRP and LRP and an interim framework for management based on status relative to the TRP. The framework is illustrated in the assessment report and is used in Scientific Committee advice to the Commission (e.g. IOTC-2013-SC16-R[E]).

The resolution does not explicitly define overfishing but implicitly defines it as F/Fmsy > 1, consistent with Bmsy and well above 20%B0. At paragraph 4, the interim framework provides guidance on management aims depending on where the stock is estimated to be in quadrants of the Kobe Plot defined by F/Fmsy and B/Bmsy, and requiring certain outcomes with high probability depending on status relative to those reference points. Specifically, noting the Kobe Plot quadrants referred to are defined by the F and SB target reference points, HCRs will take account of the following objectives:

a) For stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant;

b) For stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible;

c) For stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible;

d) For stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible.

No limit reference points are used in defining actions but the framework seeks to ensure with high probability that stocks below the Bmsy target reference points are rebuilt "in as short a period as possible" and if required that overfishing is ended with a high probability. As specified - regardless of the SB limit reference point definition - exploitation rate should be reduced well before the PRI, taken as the MSC default of 20%B0, might be approached. CR v2.0 allows for TRP-based HCR (with implied LRP) at GSA2.5 (boxed example on p 174 of Fisheries Standard v2.0).

Paragraph 4 of IOTC Res 13/10 is explicit that "the SC shall develop and assess potential harvest control rules (HCRs) to be applied, considering the status of the stocks against the reference points assessed in paragraph 3 for albacore, bigeye tuna, skipjack tuna, yellowfin tuna and swordfish. Based on the results of the MSE and considering the guidelines set forth in the UNFSA and in Article V of the IOTC Agreement, the IOTC Scientific Committee will recommend to the Commission HCRs for these tuna and tuna-like species…"

At paragraph 2, IOTC RES 13/10 requires that the IOTC Scientific Committee should endeavour to apply the interim framework in the provision of recommendations for management measures. The interim framework lays out general management aims without specifying exact actions, defining what constitutes "high probability", or specifying required rebuild periods.

CR v2.0 GSA2.5, says that "HCRs should be regarded as only 'generally understood' as required to achieve a 60 score in cases where they can be shown to have been applied in some way in the past, but have not been explicitly defined or agreed." The IOTC HCR for yellowfin have been defined by IOTC Res 13/10 and have been agreed and put in place (adopted); more importantly, IOTC Res 13/10 lays out in general terms a familiar HCR framework used in multiple jurisdictions for many stock/fishery types.

The IOTC and other tuna RFMOs are progressing HCR development through the Working Party on Tropical Tunas (WPPT) using Management Strategy Evaluation (MSE). The IOTC has provided clear guidance to the SC for developing what HCR must achieve at IOTC RES 13/10 Para 4.

We conclude that there are, therefore, generally understood HCRs in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached, meeting SG 60 scoring requirements.

HCRs are not well defined, as required for SG80 scoring.

Further, CR v2.0 SA2.5.6 requires that as part of the evidence that tools are working, teams should include current levels of exploitation in the UoA, as measured by fishing mortality rate where available. Evidence from the 2012 stock assessment (see section 5.3 and PI 1.1.1a) is that the exploitation rate was in the order of 0.69 Fmsy in 2010 and had never exceeded Fmsy (see Figure 3).

CR v2.0. GSA2.5.2-5 (at p176 of Fisheries Standard v2.0) as relates to SA2.5.6 notes that current F being "equal to or less than Fmsy should be taken as evidence that the HCR is effective." The continuing text does not elaborate on the meaning of 'usually' but concerns only cases where F is greater than Fmsy.

The most recent up-date of the skipjack stock assessment (November 2014) found that "on the weight-of-evidence available in 2014, the skipjack tuna stock is determined to be not overfished and not subject to overfishing". There are a number of uncertainties (recruitment and effort) while "catch rates have improved for the purse seine fishery while remaining stable for the Japanese longline fleet." The IOTC concluded, "it is difficult to know whether the stock is moving towards a state of being subject to overfishing". There are therefore some indications of the potential for fishing mortality to increase above Fmsy but the weight of evidence is that F is currently below Fmsy. GSA2.5.2-5 guidance suggests this should be interpreted as HCR being effective, supporting SG60 scoring using MSC CR 2.0.

3.3.1.7 Information & Monitoring

Section 8 of IOTC–2013–WPTT15–R[E] provides a comprehensive overview of the data available to the scientific assessment of this stock. Mindful that both the interim reference points (target and limit), and consequently, the current view of the status of the stock relative to those reference points depend on the quality of the assessment it is essential that the data provided are both comprehensive and of suitable quality.

- The IOTC Secretariat collate and supply to the WPTT with a range of data and statistics collated from inputs from IOTC Members and Cooperating non-Contracting Parties (CPC's), as required

by resolution 10/02 (Mandatory statistical requirements for IOTC Members and Cooperating non-Contracting Parties (CPC's), for the period 1950–2011). Details are provided in detailed in paper IOTC–2013–WPTT15–07.

» IOTC–2013–WPTT15–07 provides a range of fishery indicators, including catch and effort trends for fisheries catching bigeye tuna in the IOTC area of competence. It also covers data on nominal catches (fishery removals), catch-and effort, size-frequency and other data, in particular release and recapture (tagging) data.

» There is also a comprehensive analysis of the main issues which the Secretariat considers affect the quality of the statistics available at the IOTC, by type of dataset and type of fishery. [IOTC–2013–WPTT15–07 Rev_1]. This analysis includes issues pertaining to Catch-and-Effort data from coastal fisheries, and from surface and longline fisheries; size data; and, biological data.

» There is comprehensive reporting by the WPTT of the efforts taken to ensure the quality of all data used in the assessment is critically analysed.

» In their review of new information on the biology, ecology, stock structure, their fisheries and associated environmental data for bigeye tuna, the WPTT provide examples of the efforts undertaken to ensure that relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.

It is evident form the information reported by the WPTT that considerable, relevant, information related to (a) stock structure, (c) fleet composition (d) stock abundance (mainly standardised CPUE series) (e) fishery removals, and (f) other data are available to support the stack assessment and, thereafter, the harvest strategy.

» Monitoring indices from several fleets' standardized CPUE and from tagging data are adequate for the harvest strategy.

» While indicators of stock abundance - mainly standardised catch-per-unit-effort indices are available, a single consistent index is not available for the entire time series. However, the combined indices do appear to provide information on the change in abundance that has occurred.

In summary, data on skipjack tuna in the Indian Ocean are comprehensive, informative and relevant. These data consider (a) stock structure, (c) fleet composition (d) stock abundance (mainly standardised CPUE series) (e) fishery removals, and (f) other data and provide information on the spatial distribution of catches, their size frequencies, results of tagging studies as well as growth and mortality models. The data are adequate to allow appropriate stock assessments and to evaluate the status of the stock against target and limit reference points. In addition environmental data are used in CPUE standardization and to help explain recruitment. Stock structure data while limited are consistent with an Indian Ocean-wide stock. Overall, data are adequate for stock assessment and for an appropriate harvest control rule.

However, despite the best efforts of the IOTC secretariat it remains the case that i) issues remain with some of these data and ii) there are information gaps such that it cannot be concluded that this information constitutes a comprehensive range of information. Consequently the data do not presently allow the implied harvest control rule to be applied with a high degree of certainty.

IOTC has put considerable effort into the reporting and recording of catches by the contracting parties. These are summarised in the following resolutions:

» 13/03 On the recording of catch and effort data by fishing vessels in the IOTC area of competence

» 11/04 On a regional observer scheme

» 10/02 Mandatory statistical requirements for IOTC Members & Cooperating Non-Contracting Parties

» 10/08 Concerning a record of active vessels fishing for tunas and swordfish in the IOTC area

» 10/09 Concerning the functions of the Compliance Committee

» 06/03 On establishing a vessel monitoring system programme

» 03/03 Concerning the amendment of the forms of the IOTC statistical documents

The IOTC secretariat puts considerable effort into considering any issues identified relating to the statistics of tropical tunas. This list covers the main issues which the Secretariat considers affect the quality of the statistics available at the IOTC, by type of dataset and type of fishery. Specifically it includes issues relating to non-reporting of fishery removals and attempts to rectify or estimate these.

Standardized CPUE indices are available from several fleets. Tagging data is also available. Together these are considered are adequate for the harvest strategy.

While indicators of stock abundance - mainly standardised catch-per-unit-effort indices – are available, a single index covering the entire time series is not available.

IOTC Resolution 13/03 requires that all purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres length overall and those under 24 metres if they fish outside the EEZs of their flag States within the IOTC area of competence to keep a bound paper or electronic logbook and to record*, inter alia*, the weight (kg) or number by species per set/shot/fishing event for each of a comprehensive list of species. For purse seine, these include IOTC species, marine turtles, marine mammals, sharks, rays and other bony fish.

It is apparent that IOTC has put considerable effort into the recording and reporting of catches and that the current level of reporting is adequate given the large number of small countries involved and the difficult task of monitoring small vessels often far away or on the high seas.

3.3.1.8 Stock Assessment

A single quantitative modelling method (SS3) was applied to this with management advice based on the range of results from the model. The SS3 assessment model is age-structured, iterated on a quarterly time-step, spatially aggregated, with four fishing fleets and Beverton-Holt recruitment dynamics. Model parameters (virgin recruitment, selectivity by fleet, recruitment deviations, and M in some cases) were estimated by fitting predictions and observations of CPUE, length frequency data for all fleets, and tag recoveries (for the purse seine fleets, and in some cases, the Maldivian P&L fleet). The stock status was reported relative to reference points.

» The 2011 assessment was the initial comprehensive assessment effort. While the results are very useful, there are unresolved uncertainties in basic productivity exemplified by the lack of good estimates of fishing mortality.

» Based on the stock assessment carried out in 2012, the stock was considered to be not overfished and not subject to overfishing (Table 1). [IOTC–2013–WPTT15–R[E]

» No new stock assessment was carried out for skipjack tuna in 2013.

» Spawning stock biomass is estimated to have declined by approximately 45 % in 2011 from unfished levels. Total catch has continued to decline with 314,537 tonnes landed in 2012, in comparison to 384,537 tonnes in 2011.

» The recent declines in catches from this stock are thought to be caused by a recent decrease in purse seine effort as well as a decline in CPUE of large skipjack tuna in the surface fisheries. There remains considerable uncertainty in the assessment, and the range of runs analysed illustrate a range of stock status to be between 0.73–4.31 of SB2011/SBMSY based on all runs examined.

The assessment approach is appropriate for the stock and for the current implied harvest control rule, but it is as yet unclear whether this model accounts adequately for the features of this fishery.

The assessment estimate stock status relative to reference points and SB_{2011}/SB_{MSY} (rather than B_{2011}/B_{MSY}) and F_{2011}/F_{MSY} are presented as point estimates with 95% confidence intervals.

The stock assessment methods used in the analysis of this stock indicate uncertainty in the estimate of stock status. These uncertainties have also been examined as alternative model structures. Similarly the stock status associated with these alternative model structures have been evaluated in a probabilistic manner. While these weightings are not statistical rigorous they represent a consensus of

experts on relative importance and have been carried through Kobe plots a strategy matrix. A decision table is provided to help assess risk.

While different assessment methods have been run and compared – constituting a degree of testing – there has not been a systematic testing of the assessment. Nor have alternative hypotheses and assessment approaches have been rigorously explored.

3.3.2 Yellowfin tuna

3.3.2.1 Fisheries and catch trends

General

A recent IOTC paper, IOTC–2013–WPTT15–44, provides an overview of the statistics of the European Union (and associated flags) purse seine fishing fleet targeting tropical tunas in the Indian Ocean 1981-2012. Specifically for 2012, it notes that:

- the European Union's (and associated flags) purse seine fishing fleet of the Indian Ocean was composed of 37 vessels of individual carrying capacity >800 t, which all represented a total carrying capacity of more than 45,000 t.
- The total cumulated nominal effort was about 9,500 and 7,800 fishing and searching days, respectively.
- The total number of fishing sets was about 9,000, with about 5,600 realised on FAD-associated schools (62%).
- Overall, the capacity and nominal effort of the fleet has remained stable during recent years while total catches have dropped from more than 260,000 tonnes (2009-2011) to less than 230,000 tonnes in 2012. This is mainly explained by a combination of i) a major decrease in the number of sets per day and ii) catch rates of skipjack on FAD associated schools. The catch of skipjack per positive set is the lowest observed since 1984, (15 tonnes/set)

Yellowfin tuna (*Thunnus albacares*) is an epipelagic, oceanic, above and below the thermocline. The thermal boundaries of occurrence are roughly 18° and 31°C. Vertical distribution appears to be influenced by the thermal structure of the water column, as is shown by the close correlation between the vulnerability of the fish to purse seine capture, the depth of the mixed layer, and the strength of the temperature gradient within the thermocline. Yellowfin tuna are essentially confined to the upper 100 m of the water column in areas with marked oxyclines, since oxygen concentrations less than 2 ml/l encountered below the thermocline and strong thermocline gradients tend to exclude their presence in waters below the discontinuity layer.

Larval distribution in equatorial waters is transoceanic the year round, but there are seasonal changes in larval density in subtropical waters. It is believed that the larvae occur exclusively in the warm water sphere, that is, above the thermocline. Schooling occurs more commonly in near-surface waters, primarily by size, either in monospecific or multispecies groups. In some areas, i.e. eastern Pacific, larger fish (greater than 85 cm fork length) frequently school with porpoises. Association with floating debris and other objects is also observed. Although the distribution of yellowfin tuna in the Pacific is nearly continuous, lack of evidence for long-ranging east-west or north-south migrations of adults suggests that there may not be much exchange between the yellowfin tuna from the eastern and the central Pacific, nor between those from the western and the central Pacific. This hints at the existence of subpopulations.

Spawning occurs throughout the year in the core areas of distribution, but peaks are always observed in the northern and southern summer months respectively. Joseph (1968) gives a relationship between size and fecundity of yellowfin tuna in the eastern Pacific.

Catches

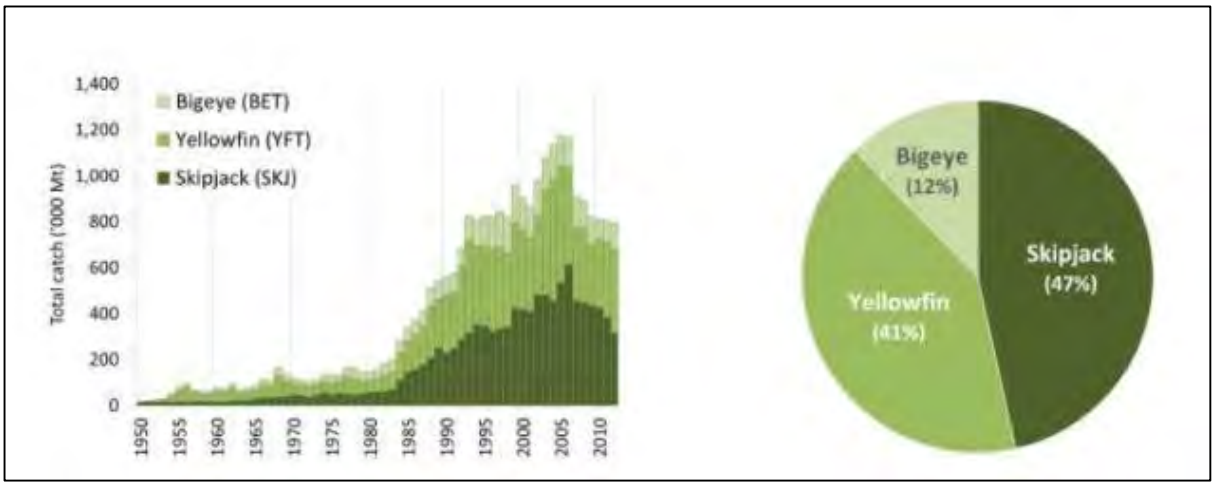
There are important yellowfin tuna fisheries throughout tropical and subtropical seas. Worldwide the most important catches (well over 100 000 t) are recorded from Fishing Areas 71 (321,458 t in 1995), 51 (250,353 t) and 77 (198,696 t). Again worldwide, landings have been steadily increasing since 1970 to 1990 when exceeded 1,000,000 t. In recent years the catches seem to be stabilized around this

quantity. Near-surface schooling yellowfin tuna are captured primarily with purse seines and by pole-and-line fishing, while trolling and gillnetting are of much lesser importance. The 1979 eastern Pacific surface fleet numbered 259 purse seiners, 45 bait boats, and 17 other vessels flying 16 flags. The carrying capacity of this fleet amounted to 169 149 t. Purse seining is increasing in the western Pacific, initially taking mainly skipjack and bluefin tuna. In 1982, the yellowfin tuna catch by US purse seiners in this area probably exceeded that of skipjack tuna, and the total purse seine catch of yellowfin by all vessels may have been higher than that of bluefin tuna. Pole-and-line fishing is still one of the major surface fishing techniques for yellowfin tuna in the Pacific, even though this method is declining in overall importance throughout the world. The most important fishing method for deep swimming yellowfin tuna is longlining, primarily by vessels from Japan, the Republic of Korea and Taiwan (Province of China). Although these fisheries operate virtually throughout the geographical range of the species, the largest catches are made in the equatorial waters of the Pacific. The total catch reported for this species to FAO for 1999 was 1 258 386 t. The countries with the largest catches were Indonesia (176 320 t) and Mexico (121 884 t).

The IOTC working party on tropical tuna (WPTT) reported the 2012 catch of yellowfin tuna as 368,663 tonnes, a 16% increase on the average catch between 2008 and2012 (317,505 tonnes). The main fishing gears for which catches have declined recently are purse seine (37% of the catch) and longline (15%). In contrast, catches by gillnet (28%) and miscellaneous gears (15%) have become increasingly important. in recent years. Catches by these gears are poorly estimated. Catches from pole-and-line vessels (4%) have been relatively stable. Overall, catches have declined by 43% from a record high of 530,000 tonnes in 2004.

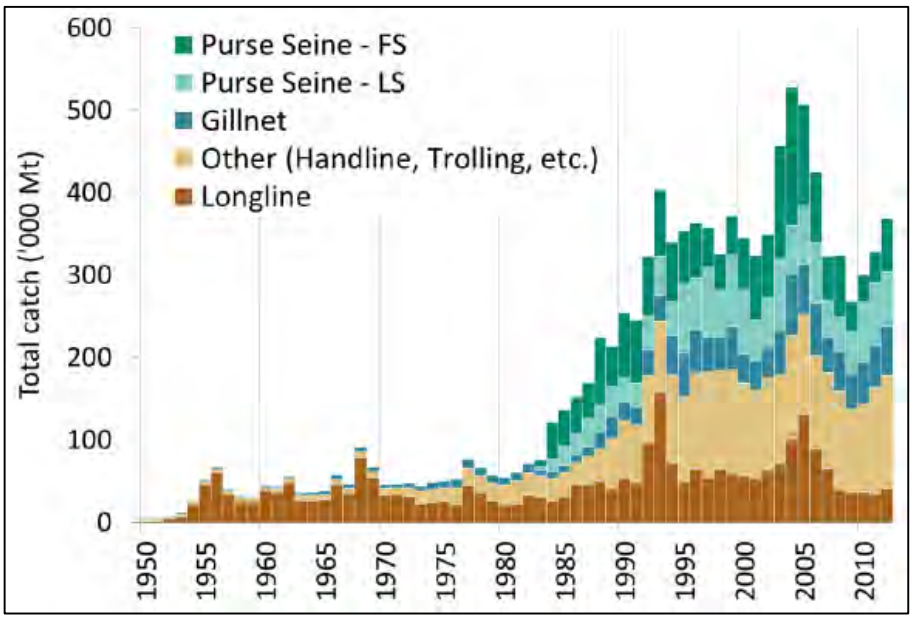
Contrary to the situation in other oceans, the artisanal fishery component in the Indian Ocean is substantial, taking 20–30% of the total catch. Catches of yellowfin tuna remained more or less stable between the mid-1950s and the early-1980s, ranging between 30,000 and 70,000 t, owing to the activities of longline vessels and, to a lesser extent, gillnet vessels. The catches increased rapidly with the arrival of the purse seiners in the early 1980s and increased activity of longliners and other fleets, reaching over 400,000 t in 1993. Catches of yellowfin tuna between 1994 and 2002 remained stable, between 330,000 and 350,000 t. Yellowfin tuna catches during 2003, 2004, 2005 and 2006 were much higher than in previous years with the highest catches ever recorded in 2004 (over 525,000 t) and average annual catch for the period at around 480,000 t. Yellowfin tuna catches dropped markedly after 2006, with the lowest catches recorded in 2009. Catch levels in 2012 are estimated to be at around 370,000 t, although they represent preliminary figures.

Figure 3.3.4a. Total catch of Indian Ocean bigeye, skipjack and yellowfin tuna 1950-2012



Source: IOTC

Figure 3.3.4b. Total catch of Indian Ocean bigeye, skipjack and yellowfin tuna 1950-2012



Source: IOTC

Although some Japanese purse seine vessels have fished in the Indian Ocean since 1977, the purse seine fishery developed rapidly with the arrival of European vessels between 1982 and 1984. Since then, there has been an increasing number of yellowfin tuna caught, with a larger proportion of the catches made of adult fish, as opposed to bigeye tuna catches, of which the majority refers to juvenile fish. Purse seine vessels typically take fish ranging from 40 to 140 cm fork length (FL) and smaller fish are more common in the catches taken north of the equator. Catches of yellowfin tuna increased rapidly to around 130,000 t in 1993, and subsequently they fluctuated around that level, until 2003–05 when they were substantially higher (over or close to 200,000 t). The amount of effort exerted by the EU purse seine vessels (fishing for yellowfin tuna and other tunas) varies seasonally and from year to year.

The purse seine fishery is characterised by the use of two different fishing modes. The fishery on floating objects (FADs), catches large numbers of small yellowfin tuna in association with skipjack tuna and juvenile bigeye tuna, and a fishery on free swimming schools, catches larger yellowfin tuna on multi-specific or mono-specific sets. Between 1995 and 2003, the FAD component of the purse seine fishery represented 48–66% of the sets undertaken (60–80% of the positive sets) and accounted for 36–63% of the yellowfin tuna catch by weight (59–76% of the total catch). The proportion of yellowfin tuna caught (in weight) on free-schools during 2003–06 (64%) was much higher than in previous or following years (at around 50%).

The longline fishery started in the early 1950's and expanded rapidly over throughout the Indian Ocean. Longline vessels mainly catch large fish, from 80 to 160 cm FL, although smaller fish in the size range 60 cm – 100 cm (FL) have been taken by longliners from Taiwan, China since 1989 in the Arabian Sea. The longline fishery targets several tuna species in different parts of the Indian Ocean, with yellowfin tuna and bigeye tuna being the main target species in tropical waters. The longline fishery can be subdivided into a deep-freezing longline component (large scale deep-freezing longliners operating on the high seas from Japan, Korea and Taiwan, China) and a fresh-tuna longline component (small to medium scale fresh tuna longliners from Indonesia and Taiwan, China). The total longline catch of yellowfin tuna reached a maximum in 1993 (≈200,000 t). Catches between 1994 and 2004 fluctuated between 85,000 t and 130,000 t. The second highest catches of yellowfin tuna by longline vessels were recorded in 2005 (≈165,000 t). As was the case for the purse seine fleets, since 2005 longline catches have declined with current catches estimated to be at around 60,000 t, representing a two-fold decrease from the catches taken in 2005. The Scientific Committee believes that the recent drop in longline catches could be related, at least in part, with the expansion of piracy in the northwest Indian Ocean, which led to a marked drop in the levels of longline effort in one of the core fishing areas of the species.

Catches by other gears, namely pole-and-line, gillnet, troll, hand line and other minor gears, have increased steadily since the 1980s. In recent years the total artisanal yellowfin tuna catch has been around 140,000–160,000 t, with the catch by gillnets (the dominant artisanal gear) at around 50,000 t. During the years 2004 and then in 2012 the catches by artisanal gears attained its maximum over the time series, peaking at 165,000 t and 170,000 t, respectively.

Yellowfin tuna catches in the Indian Ocean during 2003, 2004, 2005 and 2006 were much higher than in previous years, while bigeye tuna catches remained at their average levels. Purse seine vessels currently take the bulk of the yellowfin tuna catch, mostly from the western Indian Ocean, around Seychelles; Off Somalia (R2) and Mozambique Channel (R3). In 2003 and 2004, total catches by purse seine vessels in this area were around 225,000 t — about 50% more than the previous largest purse seine catch, which was recorded in 1995. Similarly, artisanal yellowfin tuna catches have been near their highest levels and longline vessels have reported higher than normal catches in the tropical western Indian Ocean during this period.

In recent years the catches of yellowfin tuna in the western Indian Ocean have dropped considerably, especially in areas off Somalia, Kenya and Tanzania and in particular between 2007 and 2011. The drop in catches is the consequence of a drop in fishing effort due to the effect of piracy in the western Indian Ocean region. Even though the activities of purse seiners have been affected by piracy in the Indian Ocean, the effects have not been as marked as with longliners, for which current levels of effort are close to nil in the area impacted by piracy. The main reason for this is the presence of security personnel onboard purse seine vessels of the EU and Seychelles, which has made it possible for purse seiners under these flags to continue operating in the northwest Indian Ocean. Longline effort levels in the western tropical area have increased in 2012, as a consequence of increased security in the region.

Uncertainty of catches

Retained catches are generally well known; however, catches are less certain for:

- many coastal fisheries, notably those from Indonesia, Sri Lanka, Yemen, and Madagascar
- the gillnet fishery of Pakistan
- non-reporting industrial purse seiners and longliners (NEI), and longliners of India.

Discards

Discard levels are believed to be low although they are unknown for most industrial fisheries, excluding industrial purse seiners flagged in EU countries for the period 2003–2007.

Changes to the catch series

There have not been significant changes to the total catches of yellowfin tuna since the WPTT in 2011. However, the IOTC Secretariat used new information compiled during 2012–13 to rebuild the catch series for the coastal fisheries operated in some countries, in particular Pakistan, Indonesia, Sri Lanka, and India. In general, the new catches of yellowfin tuna estimated by the IOTC Secretariat are slightly higher than those used in the past by the WPTT. More details about these reviews can be found in paper IOTC–2013–WPTT15–07 Rev_1.

CPUE Series

Catch-and-effort data are available from the major industrial and artisanal fisheries. However, these data are not available for some important fisheries or they are considered to be of poor quality for the following reasons:

- No data are available for the fresh-tuna longline fishery of Indonesia, over the entire time series, and data for the fresh-tuna longline fishery of Taiwan, China are only available since 2006
- Insufficient data for the gillnet fisheries of Iran and Pakistan
- Poor quality effort data for the significant gillnet/longline fishery of Sri Lanka
- No data are available from important coastal fisheries using hand and/or troll lines, in particular Yemen, Indonesia, and Madagascar.

3.3.2.2 Biology

Migration & Stock Structure

Regional Tuna Tagging Project-Indian Ocean (RTTP-IO) data (e.g. IOTC-2011-WPDCS08-06) provide evidence of large movements of yellowfin tuna, supporting the assumption of a single stock for the Indian Ocean (as used for stock assessment purposes). Genetic studies have not demonstrated any subpopulation structure but fisheries data (e.g. longline catches) may do so. While fisheries data need to be interpreted with care, they strongly indicate that medium sized yellowfin concentrate for feeding in the Arabian Sea.

Habitat

Yellowfin are fast-moving and wide-ranging pelagic predators and spend the majority of time in the top 100m but making occasional deep dives to much greater depths. Smaller fish are often found in surface, tropical waters (predominantly in the Arabian Sea) in mixed schools with skipjack and small bigeye tuna (*Thunnus obesus*).

Growth & Average Maximum Size

Maximum fork length is over 200 cm. The all-tackle angling record was a 176.4 kg fish of 208 cm fork length taken off the west coast of Mexico in 1977. Common to 150 cm fork length. Off the Philippines and Central America, the smallest mature fish were found within the size group from 50 to 60 cm fork length at an age of roughly 12 to 15 months (Davidoff, 1963), but between 70 and 100 cm fork length the percentage of mature individuals is much higher. All fish over 120 cm attain sexual maturity.

While IOTC–2012–WPTT14–38 notes that data support a two-stanza growth pattern it is considered that more work is needed to integrate otolith and tagging data and agree on a growth model to be used in stock assessment. The growth model currently used is due to Fonteneau (2008); it suggests an average maximum size approaching 1.5m, with 1.0m attained in 3 years, and near asymptotic growth in 4-5 years. Longevity is 6-7 years. IOTC-2012-SC15-R[E] suggest a maximum fork length of 2.4m and maximum weight of 200kg.

Reproduction

In the Indian Ocean, yellowfin spawning occurs mainly from December to March in the equatorial area (0-10°S), with the main spawning grounds west of 75°E. Secondary spawning grounds exist off Sri Lanka and the Mozambique Channel and in the eastern Indian Ocean off Australia. Yellowfin size at first maturity has been estimated at around 100 cm, and recruitment occurs predominantly in July.

Fecundity

Detailed histological work on Indian Ocean yellowfin fecundity has been undertaken (Zudairea et al, 2013) but is not used in the stock assessment. Yellowfin spawn continuously throughout the year and are highly fecund.

3.3.2.3 Stock Status

The last full assessment of this stock was carried out in 2012. The results of that assessment did not differ substantively from the previous (2011) assessment; however, the final overall estimates of stock status differ somewhat due to the refinement in the selection of the range of model options due to increased understanding of key biological parameters (primarily natural mortality). The stock assessment model used in 2012 suggests that the stock is currently not overfished (SB2010>SBMSY) and not subject to overfishing (F2010<FMSY).

Two trajectories are presented by the WPTT that compare the Kobe plots obtained from the Multifan CL (MFCL) and an age structured production model (ASPM) assessments (see later).

- The MFCL assessment indicates that fishing mortality is below the limit and target reference points during the whole time series,
- The ASPM model run indicates that the target reference points may have been exceeded during the period of high catches in the mid 2000's (2003–2006).
- Estimates of total and spawning stock biomass show a marked decrease from 2004 to 2009 in both cases, corresponding to the very high catches of 2003–2006.

Recent reductions in effort and, hence, catches resulted in a slight improvement in stock status in 2010. Spawning stock biomass in 2010 was estimated to be 38% (31–38%) of the unfished levels. Total catch has continued to increase with 368,663 t landed in 2012, a value over previous MSY estimates (344,000 t), in comparison to 327,490 t in 2011 and 300,000 t in 2010. However, catch rates have improved in the purse seine fishery while remaining stable for the Japanese longline fleet.

Therefore it is difficult to know whether the stock is moving towards a state of being subject to overfishing. If the provisional catch estimate for 2013 confirms the increasing trend, it may be necessary to carry out a new stock assessment in 2014. The following key points should be noted:

- The Maximum Sustainable Yield estimate for the whole Indian Ocean is
  - 344,000 t with a range between 290,000–453,000 t for MFCL.
  - 320,000 t with a range between 283,000 and 358,000 t for ASPM.

The management advice in 2012 indicated that annual catches of yellowfin tuna should not exceed the lower range of MSY (300,000 t) in order to ensure that stock biomass levels could sustain catches at the MSY level in the long term. Catches have exceeded this level in 2011 and 2012.

- Recent recruitment estimated by MFCL is estimated to be considerably lower than the whole time series average. If recruitment continues to be lower than average, catches below MSY would be needed to maintain stock levels. And, while recent recruitment estimated by ASPM is similar to MFCL estimates, the ASPM recruitment trend is estimated to be at a lower level without any declining trend.

Provisional reference points

Noting that the Commission in 2013 agreed to Resolution 13/10 on interim target and limit reference points (Target Reference Point: BMSY; FMSY, Limit Reference Point BLIM = 0.40 BMSY; FLIM = 1.40 FMSY) and a decision framework, the following should be noted:

Fishing mortality: Current fishing mortality is considered to be below the provisional target reference point of FMSY, and therefore below the provisional limit reference point of 1.4*FMSY.

Biomass: Current spawning biomass is considered to be above the target reference point of SBMSY, and therefore above the limit reference point of 0.4*SBMSY.

The potential yields from the fishery have also declined over the last five years as an increased proportion of the catch is comprised of smaller fish, primarily from the purse seine FAD fishery. The main mechanism that appears to be behind the very high catches in the 2003–2006 period is an increase in catchability by surface and longline fleets due to a high level of concentration across a reduced area and depth range. This was likely linked to the oceanographic conditions at the time generating high concentrations of suitable prey items that yellowfin tuna exploited. A possible increase in recruitment in previous years, and thus in abundance, cannot be completely ruled out, but no signal of it is apparent in either data or model results. This means that those catches probably resulted in considerable stock depletion.

The decrease in longline and purse seiner effort in recent years has substantially lowered the pressure on the Indian Ocean stock as a whole, indicating that current fishing mortality has not exceeded the MSY-related levels in recent years. However if the security situation in the western Indian Ocean were to improve, a rapid reversal in fleet activity in this region may lead to an increase in effort which the stock might not be able to sustain, as catches would then be likely to exceed MSY levels. Catches in 2010 (300,000 t) are within the lower range of MSY values The current assessment indicates that catches of about the 2010 level are sustainable, at least in the short term. However, the stock is unlikely to support substantively higher yields based on the estimated levels of recruitment from over the last 15 years.

In 2011, the WPTT undertook projections of yellowfin tuna stock status under a range of management scenarios for the first time, following the recommendation of both the Kobe process and the Commission, to harmonise technical advice to managers across RFMOs by producing Kobe II management strategy matrices. The purpose of the Kobe II table is to quantify the future outcomes from a range of management options.

Table 3.3.4 Yellowfin tuna: 2011 MULTIFAN-CL Indian Ocean yellowfin tuna stock assessment Kobe II Strategy Matrix. Percentage probability of violating the MSY-based reference points for five constant catch projections (2010 catch level, ± 20% and ± 40%) projected for 3 and 10 years. In the projection, however, 12 scenarios were investigated: the six scenarios investigated above as well as the same scenarios but with a lower mean recruitment assumed for the projected period. Note: from the 2011 stock assessment using catch estimates at that time.

Reference point and projection timeframe	Alternative catch projections (relative to 2010) and probability (%) of violating reference point				
	60% (165,600 t)	80% (220,800 t)	100% (276,000 t)	120% (331,200 t)	140% (386,400 t)
$SB_{2013} < SB_{MSY}$	<1	<1	<1	<1	<1
$F_{2013} > F_{MSY}$	<1	<1	58.3	83.3	100
$SB_{2020} < SB_{MSY}$	<1	<1	8.3	41.7	91.7
$F_{2020} > F_{MSY}$	<1	41.7	83.3	100	100

Source: IOTC

Table 3.3.4 describes the presently estimated probability of the population being outside biological reference points at some point in the future, where “outside” was assigned the default definitions of F>FMSY or SB<SBMSY. The timeframes represent 3 and 10 year projections (from the last data in the model), which corresponds to predictions for 2013 and 2020. The management options represent three different levels of constant catch projection: catches 20% less than 2010, equal to 2010 and 20% greater than 2010.

The projections were carried out using 12 different scenarios based on similar scenarios used in the assessment for the combination of those different MFCL runs: LL selectivity flat top vs. dome shape; steepness vales of 0.7, 0.8 and 0.9; and computing the recruitment as an average of the whole time series vs. 15 recent years (12 scenarios). The probabilities in the matrices were computed as the percentage of the 12 scenarios being SB>SBMSY and F<FMSY in each year. In that sense, there are not producing the uncertainty related to any specific scenario but the uncertainty associated to different scenarios.

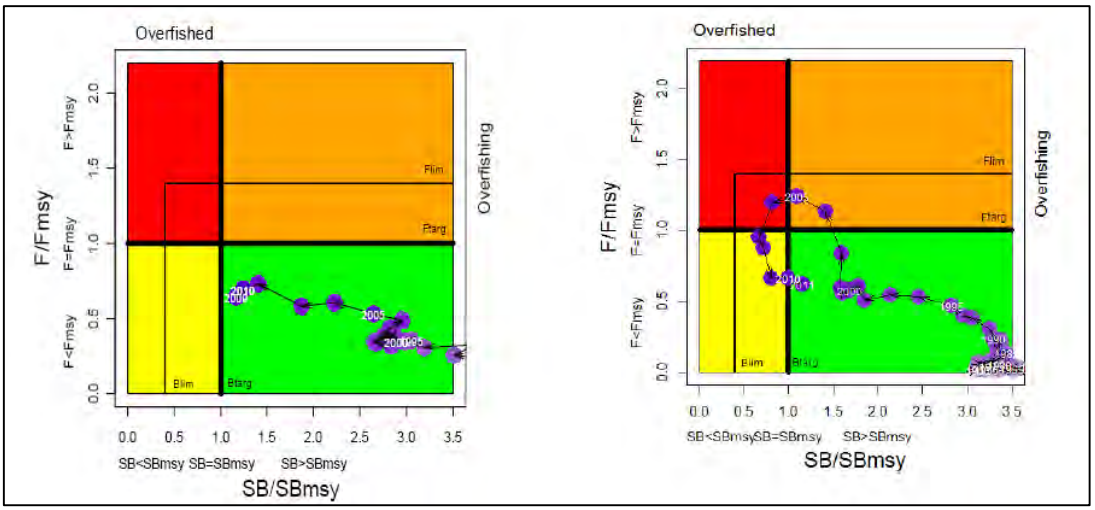
There was considerable discussion on the ability of the WPTT to carry out the projections with MFCL for yellowfin tuna. For example, it was not clear how the projection redistributed the recruitment among regions as recent distribution of recruitment differs from historic; which was assumed in the projections. The WPTT agreed that the true uncertainty is unknown and that the current characterization is not complete; however, the WPTT feels that the projections may provide a relative ranking of different scenarios outcomes. The WPTT recognised at this time that the matrices do not represent the full range of uncertainty from the assessments. Therefore, the inclusion of the K2SM at this time is primarily intended to familiarise the Commission with the format and method of presenting management advice.

The current estimate of SB2010/SBMSY is 1.24 [0.91– 1.40]. While the ASPM model run indicates that the target reference points may have been exceeded during the period of high catches in the mid 2000’s (2003–2006), the WPTT agreed that the MFCL assessment, which indicates that fishing mortality is below the limit and target reference points during the whole time series, represents the best view of the stock. Also, there is a low risk of exceeding the SBMSY in the next 6 years if catches are maintained at 2010 (8.3 % risk that SB2020 < SBMSY). However the risk that F2020 > FMSY = 8.3).

Kobe Plot:

The Kobe Plot shows stock status in relation to both spawning biomass (B) and fishing mortality rate (F) relative to Maximum Sustainable Yield (MSY).

Figure 3.3.5 Yellowfin tuna: MULTIFAN-CL Indian Ocean yellowfin tuna stock assessment Kobe plot. Blue circles indicate the trajectory of the point estimates for the SB ratio and F ratio for each year 1972–2010 for a steepness value of 0.8. The left panel is output obtained from the base case run in MFCL. The right panel is obtained from the ASPM base case model run with steepness value of 0.9.



Source: IOTC

In this case the plot shows the accepted base case (left panel); the blue circles indicate the trajectory of the point estimates for the SB ratio and F ratio for each year 1972–2010. It also shows how, over the last decade, SB relative to SBtarg is tracking downwards while F relative to Ftarg has increased slightly. The right hand panel illustrates an alternative view of the stock obtained from an age structured production model (base case). The Kobe plot does not however show the uncertainty associated with the status characterisation.

The IOTC has considered the various types of uncertainty in developing the base case assessment and the Working Party on Tropical Tunas reported on the alternative model formulations in IOTC-2012-WPTT14-R[E]. Final advice on stock status is based only on the base case assessment (median values).

In considering stock status it is also prudent to consider stock biomass in relation to both the point at which recruitment might be impaired as well as the target stock level. Concerning the point at which recruitment might be impaired it is difficult, if not impossible, to determine unless it has already been breached. In the case of yellowfin tuna however there is no evidence for recruitment impairment.

Table 3.3.5 Yellowfin tuna stock status for 2013.

Management Quantity	Indian Ocean
2012 catch estimate	368,663 t
Mean catch from 2008–2012	317,505 t
MSY	344,000 t (290,000–453,000 t)
Data period used in assessment	1972–2011
F_{2010}/F_{MSY}	0.69 (0.59–0.90)
B_{2010}/B_{MSY}	1.28 (0.97–0.1.38)
SB_{2010}/SB_{MSY}	1.24 (0.91–1.40)
B_{2010}/B_0	n.a.
SB_{2010}/SB_0	0.38 (0.28–0.38)
$B_{2010}/B_{0,\ F=0}$	n.a.
$SB_{2010}/SB_{0,\ F=0}$	n.a.

Source: IOTC

Concerning the target stock level, both SB_{2010}/SB_0 = 0.38 [0.28 – 0.38] and SB_{2010}/SB_{MSY} = 1.24 [0.91–1.40] have been determined. Based on these values the best estimate of SB_{MSY}/SB_0 is 0.31 Resolution 13/10 provides that B_{LIM} = 0.40 B_{MSY} implying an SB_{LIM}/SB_0 of 0.12. Noting CB2.3.3.4, a value of 0.20

might be more prudent. However, even against this more conservative (but consistent with CB2.3.3.4) standard the base case median estimate of SB relative to its unfished state is 0.38 [0.28 - 0.38], where even the lower 95% confidence bound is well above the default value of 0. 20. Therefore, taking account of the uncertainty associated with the base case status estimates, there is a high degree of certainty (i.e. greater than 95%, as set out in MSC CR CB2.2.1.3) that the stock is above the point where recruitment would be impaired – the default value for this being around 50% of the BMSY level.

3.3.2.4 Reference Points

In resolution 13/10 the IOTC adopted interim target (B_{MSY} and F_{MSY}) and limit (B_{LIM} = 0.40 B_{MSY} and F_{LIM} = 1.40 F_{MSY}) reference points for yellow tuna. The resolution specifies that the IOTC Scientific Committee should assess stocks against these reference points and provide advice against them, as is done both in tabular form and using Kobe process presentations. The resolution also calls on the Scientific Committee to further investigate reference points and Harvest Control Rules (HCR) using Management Strategy Evaluation (MSE). Stock assessments for yellowfin are well advanced (see IOTC–2013–SC16–R[E]) and though results are uncertain the influence of alternative assumptions and model approaches is explored.

The target reference points for this stock have been set as ratios: B/B_{MSY} and F/F_{MSY}. This is reasonable and consistent with practice elsewhere as well as with MSC requirements. The reference points are estimated based on MSY and are appropriate for tuna stocks. MSY is estimated within the stock assessment and reported to the management system. The relation of the stock relative to MSY is reported as part of the determination of stock status: <u>the SG80 is met.</u>

Resolution 13/10 sets interim target (B_{MSY} and F_{MSY}) and limit (B_{LIM} = 0.40 B_{MSY} and F_{LIM} = 1.40 F_{MSY}) reference points for yellowfin tuna. No rationale is available to support these choices. Concerning the target stock level, both SB_{2010}/SB_0 = 0.38 [0.28 – 0.38] and SB_{2010}/SB_{MSY} = 1.24 [0.91– 1.40] have been determined. Based on these values the best estimate of SB_{MSY}/SB_0 is 0.31 Resolution 13/10 provides that B_{LIM} = 0.40 B_{MSY} implying an SB_{LIM}/SB_0 of 0.12. Noting CB2.3.3.4, a value of 0.20 might be more prudent. Although the IOTC has yet to adopt a specific limit reference point, management advice is provided relative to MSY as a target. The default 50% BMSY is assumed here for purposes of defining stock status. However, the lack of a well-defined point indicates that the <u>SG80 is not met.</u>

The implied B_{lim} of 12%B_0 is below the default certification requirement of 20% B_0. There is, however, no indication of impaired recruitment to date. The reference points in use are interim and work is planned to refine them using MSE to evaluate reference points and HCR. Clearly the intention of the IOTC (management response) and the basis on which scientific advice is supplied is to maintain the stock at or above the MSY level. Therefore, although an interim target reference point is defined at a level consistent with B_{MSY} – <u>thus meeting SG80</u> - a more precise definition justified through scientific analysis and research would be necessary before the higher guidepost could be met.

3.3.2.5 Harvest Strategy

In resolution 12/01 the IOTC agrees to apply the precautionary approach, in accordance with relevant internationally agreed standards, in particular with the guidelines set forth in the UNFSA, and to ensure the sustainable utilisation of fisheries resources as set forth in Article V of the IOTC Agreement. Further, in applying the precautionary approach, the IOTC has agreed:

1. That the Commission shall adopt, after due consideration of the advice supplied by the IOTC Scientific Committee, a) stock-specific reference points (including, but not necessarily limited to, target and limit reference points), relative to fishing mortality and biomass, and b) associated harvest control rules, that is, management actions to be taken as the reference points for stock status are approached or if they are breached.
2. That reference points and harvest control rules shall be determined so that, according to the best available science, the risk of a negative impact on the sustainability of Indian Ocean resources of tuna and tuna-like species is minimised.
3. That in the determination of appropriate reference points and harvest control rules, consideration must be given to major uncertainties, including the uncertainty about the status of the stocks relative to the reference points, uncertainty about biological, environmental and

socio-economic events and the effects of fishing activities on non-target and associated or dependent species.

4. That if an unanticipated event, such as a natural phenomenon has a significant adverse impact on the status of a stock or its associated environment, the Commission shall adopt Conservation and Management Measures on an emergency basis to ensure that fishing activity does not exacerbate such adverse impacts.
5. That initially and as an interim measure, the Commission may adopt provisional reference points and harvest control rules, taking into account the advice of the IOTC Scientific Committee; such measures would remain current until such time as the Commission chooses to update them.
6. That it will instruct the IOTC Scientific Committee to assess, through the management strategy evaluation process, the performance of reference points, including any interim reference points, and of potential harvest control rules to be applied as the status of the stocks approaches the reference points.
7. And that after completion of the management strategy evaluation, the IOTC Scientific Committee should provide the Commission with recommended reference points for all major stocks, and cast future advice on the status of the stocks relative to the adopted reference points, on the basis of the best available scientific evidence.
8. Finally, that the IOTC Scientific Committee will report on the progress of the management strategy evaluation process at

Given that resolution 13/10 **has set** interim target (B_{MSY} and F_{MSY}) and limit (B_{LIM} = 0.40 B_{MSY} and F_{LIM} = 1.50 F_{MSY}) reference points, then resolution 12/01 may be taken to provide context for an overall harvest strategy including the intention that management responses ultimately be guided by HCRs once determined using MSE. For example, the 12/01 framework specifies that consideration must be given to major uncertainties, including the uncertainty about the status of the stocks relative to the reference points, uncertainty about biological, environmental and socio-economic events and the effects of fishing activities on non-target and associated or dependent species and that if an unanticipated event, such as a natural phenomenon has a significant adverse impact on the status of a stock or its associated environment, the Commission shall adopt Conservation and Management Measures on an emergency basis to ensure that fishing activity does not exacerbate such adverse impacts.

In addition IOTC Recommendation 14/07 (to standardise the presentation of scientific information in the annual scientific committee report and in working party reports), sets out a framework for reporting uncertainty around estimates. Specifically it provides that, in support of the scientific advice made available by the IOTC Scientific Committee, the 'Executive Summaries' within the annual IOTC Scientific Committee report which present stock assessment results, include when possible, a Kobe plot/chart showing any Target and Limit Reference Points adopted by the Commission; the stock estimates, expressed in reference to Target Reference Points adopted by the Commission; the estimated uncertainty around estimates, provided that statistical methods to do so have been agreed upon the Scientific Committee and that sufficient data exist; and the stock status trajectory.

The overall effect, therefore, of resolutions 12/01, 13/10 and 14/07 is to provide interim elements of the final harvest strategy that are clearly intended to ensure that the stock is maintained around the target reference points (B_{MSY} and F_{MSY}). In that sense then, the intention of the resolutions are consistent with appropriate management; they provide a framework that is well known from other fisheries where it has proven effective. There is no reason to believe that it would be any less effective here if strictly applied.

Similarly, scientific advice has been formulated relative to a harvest strategy which is, in turn, relative to MSY reference points. This is responsive to that state of the stock and to limit and target reference points commonly used for tropical tunas.

And while the strategy is not clearly defined but, rather is “implied” and while it is not clear whether the harvest strategy will be successful in all circumstances, it is none the less apparent from the report of the WPTT that while the harvest strategy may not have been fully tested, monitoring is in place. Further, it is evident from the most recent assessment that for this stock a) the catch is below MSY, b) the stock is NOT overfished. This indicates that overall controls on the exploitation of this stock have been

adequate to date and the harvest strategy is achieving its objectives. This meets the SG80. That being said, and in the absence of direct evidence or the results of a full MSE, there is not specific evidence that the harvest strategy will work in practice under different circumstances: that is, it has not be full evaluated.

Further while there is no pre-agreement on how to react to stock changes and stock assessments required to evaluate management performance are not frequent - given the stock is heavily exploited. It has yet to be shown that the management system can maintain stock at the target level (B>BMSY, F<FMSY). Thus the stock does not meet the SG100

Conversely at paragraph 4 of IOTC resolution 13/10, the interim framework provides guidance on management aims if target reference points are breached. These require that the IOTC Scientific Committee develop and assess potential harvest control rules. And while this work is ongoing, and final HCRs do not therefore yet exist, the objectives of the management strategy are established. These are set out in paragraph 4 of resolution 13/10 as follows:

HCRs will take account of the following objectives:

- For stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant;
- For stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible;
- For stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible;

For stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible

The work of the WPTT provides clear evidence that monitoring of this stock is adequate to determine whether the harvest strategy is working. The different parts of the strategy include maintaining both B/B_{MSY} and F/F_{MSY}. Data are collected to estimate these quantities and updates and assessments conducted. The latter reports best estimates of biomass, which indicates whether management is achieving its objectives or not. That being said there is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible.

3.3.2.6 Harvest Control Rules & Tools

Whereas the overall effect of resolutions 12/01 and 13/10 is to provide interim elements of the final harvest strategy that are clearly intended to ensure that the stock is maintained around the target reference points (B_{MSY} and F_{MSY}) the strategy is not fully specified. Further, and noting that Harvest Control Rules are a separate component of any harvest strategy, again Harvest Control Rules are implied rather than explicitly specified. In other words the interim framework does lay out general management aims. It does this by agreeing its *intention* that the IOTC Scientific Committee **will** recommend to the Commission HCRs, which among other factors, taking account of the following objectives:

- For stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant;
- For stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible;
- For stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible;
- For stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible.

Though poorly defined in its current form, resolution 13/10 none-the-less can be said provide a framework that is well known from other fisheries where it has proven effective. Therefore on that basis,

then, it must be concluded that there are "generally understood harvest control rules in place consistent with the harvest strategy".

Apart from clearly defined HCRs, an effective management strategy must also have in place effective tools that ensure effective implementation of any decision taken as part of strategy whether catch or effort limits, closed areas, technical conservation measures etc. Currently the tools provided in respect of big eye include:

- Resolution 13/03 on the recording of catch and effort by fishing vessels in the IOTC area of competence
- Resolution 13/07 concerning a record of licensed foreign vessels fishing for IOTC species in the IOTC area of competence and access agreement information
- Resolution 13/10 On interim target and limit reference points and a decision framework
- Resolution 13/11 On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna and a recommendation for non-targeted species caught by purse seine vessels in the IOTC area of competence
- Resolution 12/11 on the implementation of a limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties
- Resolution 12/13 for the conservation and management of tropical tunas stocks in the IOTC area of competence.
- Resolution 10/02 mandatory statistical requirements for IOTC Members and Cooperating non-Contracting Parties (CPC's) Resolution 10/08 concerning a record of active vessels fishing for tunas and swordfish in the IOTC area

And while it is not entirely clear if these measures are adequate to fully implement and enforce an effective harvest strategy, with the stock moving towards the biomass target reference point adopted in resolution 13/10, (B/ B_{MSY}), it is evident that IOTC has started to investigate and develop other steps to control fishing. These include:

- An ongoing process to develop a catch allocation scheme based on already developed allocation principles. IOTC-2011-SS4-Prop A[E], IOTC-2011-SS4-Prop B[E], IOTC-2013-TCAC02-R[E]) clearly demonstrate the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction. This is further emphasised by IOTC RES 12/13 which explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ.
- Explicit HCRs for skipjack are currently under development using a well-specified MSE approach.

It is also the case that

- IOTC has demonstrated the technical ability to implement spatial/temporal closures.
- IOTC RES12/11 is aimed at determining fishing capacity for all IOTC Contracting Parties and Cooperating Non-Contracting Parties, and ensuring that capacity is not increased. The effectiveness of the provision is due for consideration in 2014.

Collectively these provide evidence that the IOTC intends to implement HCRs once fully developed. Further, various tools are in place or are being developed. The likely tools to be put in use when needed include spatial and temporal closures to improve exploitation pattern and quotas allocated between states. These tools are proven to be effective in other settings if implemented appropriately.

<u>In summary;</u>

Harvest control rules for this stock are not well-defined and there is no specific plan of control if the stock size falls below the trigger point (MSY). There is, however, evidence of an intention to end overfishing and rebuild this stock should depletion occur and the scientific committee is called on to provide such advice. Therefore there are generally understood harvest rules in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached <u>meeting the SG60</u>. However these are neither well defined nor have they been tested to

ensure that the exploitation rate is reduced as limit reference points are approached; consequently the SG80 is not met.

As the current, interim, framework does not include well defined harvest control rules or specific guidance on management it then it cannot be said that selection of the harvest control rules takes into account the main uncertainties. Rather it must be concluded that the SG80 has not been met.

As the biomass of this stock has, to date, remained above the target reference point there has not been any occasion where a level of control to respond to excess fishing pressure however has been demonstrated. That being said, resolution 12/13 (for the conservation and management of tropical tunas stocks in the IOTC area of competence) is applicable in 2011, 2012, 2013 and 2014 to all vessels of 24 meters overall length and over, and under 24 meters if they fish outside their EEZ, fishing within the IOTC area of competence.

This resolution requires that with a view to decreasing the pressure on the main targeted stocks and in particular on the yellowfin tuna and bigeye tuna in the IOTC area of competence for the years 2011, 2012, 2013 and 2014, the area bounded by 0 ° - 10° North 40° and 60° East will be closed for longline vessels in each year from 0000 hours on 1 February to 2400 hours on 1 March, and for purse-seine vessels in each year from 0000 hours on 1 November to 2400 hours on 1 December:

Thus the tools that the IOTC have available include TACs, area access and other measures. The IOTC has begun to develop allocation mechanisms for both TACs and access agreements and the Scientific Committee has initiated the process of control rule development. There is some evidence that some IOTC members have controlled their own catches in an effective manner, meeting the SG60. Nevertheless, there are as of yet no harvest control rules at the IOTC level and, thus, no evidence that the tools are effective.

Note: Following the MSC Notice, “Scoring of ‘available’ Harvest Control Rules (HCRs) in CRv1.3 fisheries” of 24th November, PI 1.2.2 SI a and c are scored using CR v2.0 provisions for SG60 scoring. The notice provides for scoring using CR v2.0 at 1.2.2a and c, but is aimed at avoiding ‘incorrect interpretation’ at CR v1.3 PI 1.2.2c. It is also aimed at ensuring consistency between assessments that are being harmonized (as is this assessment).

CR v2.0 scoring guidance is provided at SA2.5.2 that includes conditions for use of CR v2.0 when generally understood HCRs are considered to be available but not actually in place. The basis for SG60 scoring at PI 1.2.2a is that generally understood HCR are in place in this fishery – specifically through adoption of IOTC Res 13/10. Conditions for use of CR v2.0 laid out at SA2.5.2 are therefore not relevant in this case.

At CR v2.0 GSA2.5 it is clear for SG60 scoring that “HCRs should be likely to ensure that stocks will be maintained above the PRI”. At PI 1.1.2 SI (b), above, it is noted the IOTC has implicitly adopted an interim LRP of 12.4% B0 but without justification. For the purposes of this assessment, and consistent with comments at PI 1.1.2 SI (b), the PRI is assumed to be 20% B0, consistent with MSC CR v1.3 CB2.3.3.4 and MSC CR v2.0 GSA2.2.3.

Resolution IOTC RES 13/10 specifies interim MSY-related TRP and LRP and an interim framework for management based on status relative to the TRP. The framework is illustrated in the assessment report and is used in Scientific Committee advice to the Commission (e.g. IOTC-2013-SC16-R[E]).

The resolution does not explicitly define overfishing but implicitly defines it as F/Fmsy > 1, consistent with Bmsy and well above 20%B0. At paragraph 4, the interim framework provides guidance on management aims depending on where the stock is estimated to be in quadrants of the Kobe Plot defined by F/Fmsy and B/Bmsy, and requiring certain outcomes with high probability depending on status relative to those reference points. Specifically, noting the Kobe Plot quadrants referred to are defined by the F and SB target reference points, HCRs will take account of the following objectives:

a) For stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant;

b) For stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible;

c) For stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible;

d) For stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible.

No limit reference points are used in defining actions but the framework seeks to ensure with high probability that stocks below the Bmsy target reference points are rebuilt "in as short a period as possible" and if required that overfishing is ended with a high probability. As specified - regardless of the SB limit reference point definition - exploitation rate should be reduced well before the PRI, taken as the MSC default of 20%B0, might be approached. CR v2.0 allows for TRP-based HCR (with implied LRP) at GSA2.5 (boxed example on p 174 of Fisheries Standard v2.0).

Paragraph 4 of IOTC Res 13/10 is explicit that "the SC shall develop and assess potential harvest control rules (HCRs) to be applied, considering the status of the stocks against the reference points assessed in paragraph 3 for albacore, bigeye tuna, skipjack tuna, yellowfin tuna and swordfish. Based on the results of the MSE and considering the guidelines set forth in the UNFSA and in Article V of the IOTC Agreement, the IOTC Scientific Committee will recommend to the Commission HCRs for these tuna and tuna-like species…"

At paragraph 2, IOTC RES 13/10 requires that the IOTC Scientific Committee should endeavour to apply the interim framework in the provision of recommendations for management measures. The interim framework lays out general management aims without specifying exact actions, defining what constitutes "high probability", or specifying required rebuild periods.

CR v2.0 GSA2.5, says that "HCRs should be regarded as only 'generally understood' as required to achieve a 60 score in cases where they can be shown to have been applied in some way in the past, but have not been explicitly defined or agreed." The IOTC HCR for yellowfin have been defined by IOTC Res 13/10 and have been agreed and put in place (adopted); more importantly, IOTC Res 13/10 lays out in general terms a familiar HCR framework used in multiple jurisdictions for many stock/fishery types.

The IOTC and other tuna RFMOs are progressing HCR development through the Working Party on Tropical Tunas (WPPT) using Management Strategy Evaluation (MSE). The IOTC has provided clear guidance to the SC for developing what HCR must achieve at IOTC RES 13/10 Para 4.

We conclude that there are, therefore, generally understood HCRs in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached, meeting SG 60 scoring requirements.

HCRs are not well defined, as required for SG80 scoring.

Further, CR v2.0 SA2.5.6 requires that as part of the evidence that tools are working, teams should include current levels of exploitation in the UoA, as measured by fishing mortality rate where available. Evidence from the 2012 stock assessment (see section 5.3 and PI 1.1.1a) is that the exploitation rate was in the order of 0.69 Fmsy in 2010 and had never exceeded Fmsy (see Figure 3).

CR v2.0. GSA2.5.2-5 (at p176 of Fisheries Standard v2.0) as relates to SA2.5.6 notes that current F being "equal to or less than Fmsy should be taken as evidence that the HCR is effective." The continuing text does not elaborate on the meaning of 'usually' but concerns only cases where F is greater than Fmsy.

The most recent up-date of the yellowfin stock assessment (November 2014) found that "on the weight-of-evidence available in 2014, the yellowfin tuna stock is determined to be not overfished and not subject to overfishing". There are a number of uncertainties (recruitment and effort) while "catch rates have improved for the purse seine fishery while remaining stable for the Japanese longline fleet." The IOTC concluded, "it is difficult to know whether the stock is moving towards a state of being subject to overfishing". There are therefore some indications of the potential for fishing mortality to increase above Fmsy but the weight of evidence is that F is currently below Fmsy. GSA2.5.2-5 guidance suggests this should be interpreted as HCR being effective, supporting SG60 scoring using MSC CR 2.0.

3.3.2.7 Information & Monitoring

Section 9 of IOTC–2013–WPTT15–R[E] provides a comprehensive overview of the data available to the scientific assessment of this stock. Mindful that both the interim reference points (target and limit), and consequently, the current view of the status of the stock relative to those reference points depend on the quality of the assessment it is essential that the data provided are both comprehensive and of suitable quality.

- The IOTC Secretariat collate and supply to the WPTT with a range of data and statistics collated from inputs from IOTC Members and Cooperating non-Contracting Parties (CPC's), as required by resolution 10/02 (Mandatory statistical requirements for IOTC Members and Cooperating non-Contracting Parties (CPC's), for the period 1950–2011). Details are provided in detailed in paper IOTC–2013–WPTT15–07.
- IOTC–2013–WPTT15–07 provides a range of fishery indicators, including catch and effort trends for fisheries catching bigeye tuna in the IOTC area of competence. It also covers data on nominal catches (fishery removals), catch-and effort, size-frequency and other data, in particular release and recapture (tagging) data.
- There is also a comprehensive analysis of the main issues which the Secretariat considers affect the quality of the statistics available at the IOTC, by type of dataset and type of fishery. [IOTC–2013–WPTT15–07 Rev_1]. This analysis includes issues pertaining to Catch-and-Effort data from coastal fisheries, and from surface and longline fisheries; size data; and, biological data.
- There is comprehensive reporting by the WPTT of the efforts taken to ensure the quality of all data used in the assessment is critically analysed.
- In their review of new information on the biology, ecology, stock structure, their fisheries and associated environmental data for bigeye tuna, the WPTT provide examples of the efforts undertaken to ensure that relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.

It is evident form the information reported by the WPTT that considerable, relevant, information related to (a) stock structure, (c) fleet composition (d) stock abundance (mainly standardised CPUE series) (e) fishery removals, and (f) other data are available to support the stack assessment and, thereafter, the harvest strategy.

- Monitoring indices from several fleets' standardized CPUE and from tagging data are adequate for the harvest strategy.
- While indicators of stock abundance - mainly standardised catch-per-unit-effort indices are available, a single consistent index is not available for the entire time series. However, the combined indices do appear to provide information on the change in abundance that has occurred.

In summary, data on yellowfin tuna in the Indian Ocean are comprehensive, informative and relevant. These data consider (a) stock structure, (c) fleet composition (d) stock abundance (mainly standardised CPUE series) (e) fishery removals, and (f) other data and provide information on the spatial distribution of catches, their size frequencies, results of tagging studies as well as growth and mortality models. The data are adequate to allow appropriate stock assessments and to evaluate the status of the stock against target and limit reference points. In addition environmental data are used in CPUE standardization and to help explain recruitment. Stock structure data while limited are consistent with an Indian Ocean-wide stock. Overall, data are adequate for stock assessment and for an appropriate harvest control rule.

However, despite the best efforts of the IOTC secretariat it remains the case that i) issues remain with some of these data and ii) there are information gaps such that it cannot be concluded that this information constitutes a comprehensive range of information. Consequently the data do not presently allow the implied harvest control rule to be applied with a high degree of certainty

IOTC has put considerable effort into the reporting and recording of catches by the contracting parties. These are summarised in the following resolutions:

- 13/03 On the recording of catch and effort data by fishing vessels in the IOTC area of competence
- 11/04 On a regional observer scheme
- 10/02 Mandatory statistical requirements for IOTC Members & Cooperating Non-Contracting Parties
- 10/08 Concerning a record of active vessels fishing for tunas and swordfish in the IOTC area
- 10/09 Concerning the functions of the Compliance Committee
- 06/03 On establishing a vessel monitoring system programme
- 03/03 Concerning the amendment of the forms of the IOTC statistical documents

The IOTC secretariat puts considerable effort into considering any issues identified relating to the statistics of tropical tunas. This list covers the main issues which the Secretariat considers affect the quality of the statistics available at the IOTC, by type of dataset and type of fishery. Specifically it includes issues relating to non-reporting of fishery removals and attempts to rectify or estimate these.

Standardized CPUE indices are available from several fleets. Tagging data is also available. Together these are considered are adequate for the harvest strategy.

While indicators of stock abundance - mainly standardised catch-per-unit-effort indices – are available, a single index covering the entire time series is not available.

The WPTT agreed that the main source of information on abundance trends for stock assessment purposes is the index of abundance derived from the Japan and Taiwan, China longline CPUE series. Concerns were raised on the ability of this standardised CPUE series to represent the yellowfin tuna stock abundance in the Indian Ocean. These indices have shown steep declining trends in the Western tropical area, where most of the catches occur, over the last five years. Moreover, the decrease and almost disappearance of effort of the Taiwan, China and Japan longline vessels in the north-western part of the Indian Ocean during recent years due to the piracy, raise a concern about the utility and representativeness of these indices for stock assessment during recent years. There is substantial difficulty in fully understanding and quantifying changes in the fishery that would help interpreting the patterns observed in the index of abundance.

IOTC Resolution 13/03 requires that all purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres length overall and those under 24 metres if they fish outside the EEZs of their flag States within the IOTC area of competence to keep a bound paper or electronic logbook and to record*, inter alia*, the weight (kg) or number by species per set/shot/fishing event for each of a comprehensive list of species. For purse seine, this includes

- Albacore (*Thunnus alalunga*)
- Bigeye tuna (*Thunnus obesus*)
- Yellowfin tuna (*Thunnus albacares*)
- Skipjack tuna (*Katsuwonus pelamis*)
- Other IOTC species
- Marine turtles (in number)
- Marine mammals (in number)
- Whale sharks (*Rhincodon typus*) (in number)
- Thresher sharks (A*lopia*s spp.)
- Oceanic whitetip shark (*Carcharhinus longimanus)*
- Silky sharks (*Carcharhinus falciformis*)
- Mantas and devil rays (*Mobulidae*)
- Other sharks
- Other rays
- Other bony fish

It is apparent that IOTC has put considerable effort into the recording and reporting of catches and that the current level of reporting is adequate given the large number of small countries involved and the difficult task of monitoring small vessels often far away or on the high seas.

3.3.2.8 Stock Assessment

The primary assessment tool for Indian Ocean yellowfin is Multifan-CL which incorporates multiple fisheries, gears, growth and selectivity models and spatial variability. Alternative model structures have been explored and sensitivity testing has been conducted; this has considered both model structure and uncertainty. The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery. The assessment estimates stock status relative to reference points and B_{2010}/B_{MSY} and F_{2010}/F_{MSY} are presented as point estimates with 95% confidence intervals.

In 2011, the WPTT undertook projections of yellowfin tuna stock status under a range of management scenarios, following the recommendation of both the Kobe process and the Commission (to harmonise technical advice to managers across RFMOs by producing Kobe II management strategy matrices). Management options presented represent three different levels of constant catch projection. Projections were carried out using 12 different scenarios based on similar scenarios used in the assessment. Probabilities were computed as the percentage of 12 scenarios being SB>SBMSY and F<FMSY in each year.

Noting that there was considerable discussion on the ability of the WPTT to carry out the projections with MFCL for yellowfin tuna (for example, it was not clear how the projection redistributed the recruitment among regions as recent distribution of recruitment differs from historic; which was assumed in the projections) the WPTT agreed that the true uncertainty is unknown and that the current characterization is not complete. However the WPTT noted that the projections provide a relative ranking of different scenarios outcomes. As the matrices do not represent the full range of uncertainty from the assessments the inclusion of the K2SM at this time is primarily intended to familiarise the Commission with the format and method of presenting management advice.

In summary, the stock assessment methods used in the analysis of this stock indicate uncertainty in estimates of stock status. These uncertainties have also been examined as alternative model structures. Similarly, the stock status associated with these alternatives model structures have been evaluated in a probabilistic manner. The use of probability in the management advice allows risk to be taken into account in the decision making process.

Paper IOTC–2013–WPTT15–39 provides a Stock assessment on yellowfin tuna in the Indian Ocean using *A Stock-Production Model Incorporating Covariates* (ASPIC) with the nominal catch by fleet and the standardized CPUE of JPN LL and TWN LL updated up to 1972-2012. The authors noted that whereas the objective of this study was not to provide any management advices on this species it was, rather, to compare ASPIC results with those of MFCL and ASPM which were conducted in 2012. As a result (Kobe plot I; stock trajectory), it suggested that ASPIC and ASPM showed the similar pattern.

The WPTT NOTED that one or the other series should be used, as they give contradictory signals. It would be better to run the CPUE series separately.

The WPTT NOTED that in order to compare with latest stock assessments, this analysis should be carried out using similar inputs (i.e. CPUE series) as the ones used in MULTIFAN-CL.

In summary while different assessment methods have been run and compared – constituting a degree of testing – there has not been a systematic testing of the assessment,nor have alternative hypotheses and assessment approaches have been rigorously explored and this is noted as a shortcoming.

The most recent stock assessment (IOTC-2012-WPTT14-38) was primarily conducted by a contracted assessment scientist. Thereafter it was reviewed by the WPTT, at which both national scientists and invited experts participate. Thus whereas there is clearly a degree of peer review (*i.e.* national scientists and invited experts review the work of the independent assessment scientist) that meets SG80 it is not clearly apparent that this review was *externally* reviewed.

3.3.3 Bigeye tuna

3.3.3.1 Fisheries and catch trends

General

A recent IOTC paper, IOTC–2013–WPTT15–44, provides an overview of the statistics of the European Union (and associated flags) purse seine fishing fleet targeting tropical tunas in the Indian Ocean 1981-2012. Specifically for 2012, it notes that:

- the European Union's (and associated flags) purse seine fishing fleet of the Indian Ocean was composed of 37 vessels of individual carrying capacity >800 t, which all represented a total carrying capacity of more than 45,000 t.
- The total cumulated nominal effort was about 9,500 and 7,800 fishing and searching days, respectively.
- The total number of fishing sets was about 9,000, with about 5,600 realised on FAD-associated schools (62%).
- Overall, the capacity and nominal effort of the fleet has remained stable during recent years while total catches have dropped from more than 260,000 tonnes (2009-2011) to less than 230,000 tonnes in 2012. This is mainly explained by a combination of i) a major decrease in the number of sets per day and ii) catch rates of skipjack on FAD associated schools. The catch of skipjack per positive set is the lowest observed since 1984, (15 tonnes/set).

Catches

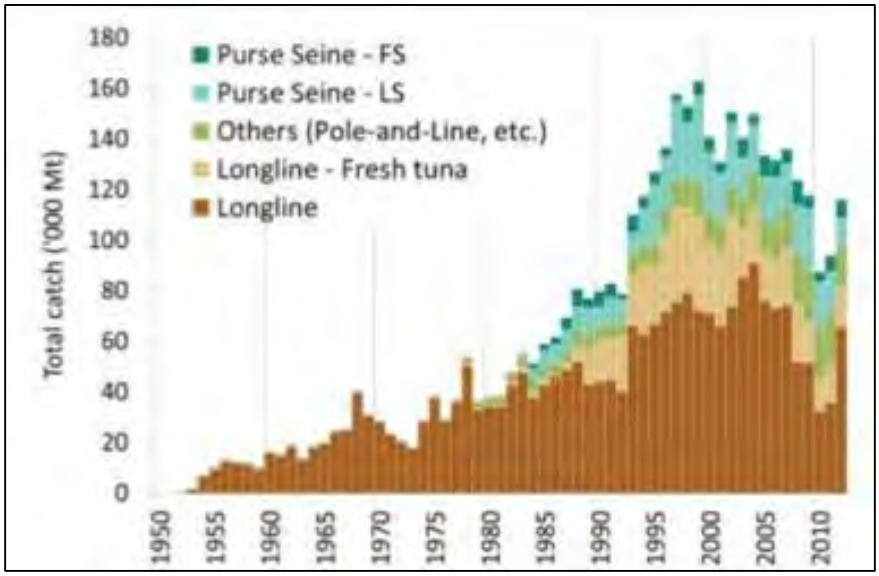
Bigeye tuna are mainly taken in industrial longline (70% in 2012) and purse seine (19% in 2012) fisheries, with the remaining 11% of the catch taken by other gears (including gillnets). Total annual catches increased steadily from the start of the fishery, reaching 100,000 tonnes in 1993 and 160,000 tonnes in 1999. Since then however catches declined to 130,000–150,000 tonnes between 2000 and 2007, and to less than 90,000 tonnes in recent years (2010–11). The Scientific Committee of the IOTC believes that this recent drop could be related, at least in part, to the expansion of piracy in the northwest Indian. In 2012 catches increased to 115,000 tonnes.

Table 3.3.6. Catches (t) of bigeye tuna in the Indian Ocean by gear type 1950's-2000's

	1950s	1960s	1970s	1980s	1990s	2000s	% 2000s	% Purse Seine
Pole-and-Line	21	50	266	1,536	2,968	4,864	4%	
Purse seine free-school	0	0	0	2,341	4,823	6,216	5%	23%
Purse seine associated school	0	0	0	4,855	18,317	20,253	15%	77%
Deep-freezing longline	6,488	21,979	30,270	42,887	62,311	71,273	53%	
Fresh-tuna longline	0	0	218	3,066	26,307	23,471	17%	
Line (handline, gillnet & longline combine)	43	294	658	2,384	4,278	5,560	4%	
Other gears nei (gillnet, trolling etc.)	38	63	164	859	1,407	3,725	3%	
Total	6,589	22,387	31,577	57,930	120,411	135,362	100%	

Source: IOTC-2013-WPTT-15-R[E]

Figure 3.3.6 relative catches of Indian Ocean bigeye tuna – 1950's onwards. (Data as of September 2013).



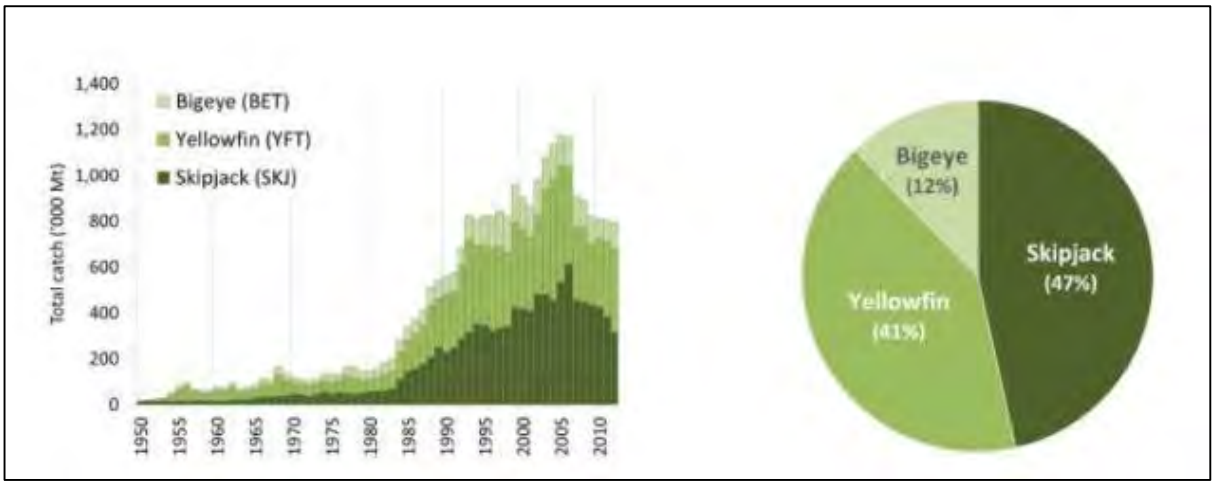
Source: IOTC-2013-WPTT-15-R[E]

While bigeye tuna have been caught by industrial longline fleets since the early 1950s, prior to 1970 these were as an incidental catch. After 1970 however, and the emergence of a sashimi market, bigeye tuna become a primary target species for the main industrial longline fleets. Longlining remains the most important gear targeting this stock and, since the late 1980s Taiwan-China has been the major

longline fleet, taking as much as 40% of the total longline catch. Since the late 1970s, bigeye tuna has also been caught by purse seine vessels fishing on tunas aggregated on floating objects and, to a lesser extent, associated to free swimming schools of skipjack tuna and yellowfin tuna.

The highest catch of bigeye tuna by purse seiners in the Indian Ocean was recorded in 1999 with some 40,000 tonnes taken. Since then catches have been between 20,000 and 30,000 tonnes. Purse seiners flagged to EU countries and the Seychelles take the majority of these fish the majority of which tend to be smaller, juvenile, fish averaging around 5 kg. In 2013 the WPTT noted that the proportion of bigeye tuna catches by purse seine from free schools had increased. Bigeye tuna forming free schools are adult fish with a size range similar to that found in longline catches [IOTC–2013–WPTT15–44].

Figure 3.3.7 Contribution of the three tropical tuna species under the IOTC mandate to the total catches of IOTC species in the Indian Ocean, over the period 1950–2012. Left: nominal catch of each species, 1950–2012. Right: share of tropical tuna catch by species, 2009–12).



Source: IOTC

3.3.3.2 Biology

Taxonomy and geographic range

Bigeye tuna is a member of the family Scombridae. It is a “true” tuna, belonging to the genus Thunnus, subgenus Thunnus (Neothunnus). A large species, it is deepest near middle of first dorsal fin base. There are 23 to 31 gillrakers on first arch. The pectoral fins are moderately long (22 to 31% of fork length) in large individuals (over 110 cm fork length), but very long (as long as in T. alalunga) in smaller individuals (though in fish shorter than 40 cm they may be very short). A swim bladder is present, The species has 18 precaudal plus 21 caudal vertebrae. The lower sides and belly are whitish; a lateral iridescent blue band runs along sides in live specimens; first dorsal fin is deep yellow; second dorsal and anal fins are light yellow; and the finlets are bright yellow edged with black.

Geographic Range: Worldwide in tropical and subtropical waters of the Atlantic, Indian and Pacific oceans, but absent from the Mediterranean.

Habitat

The species is epipelagic and mesopelagic in oceanic waters, occurring from the surface to about 250 m depth. Temperature and thermocline depth seem to be the main environmental factors governing the vertical and horizontal distribution of bigeye tuna. Water temperatures in which the species has been found range from 13° to 29° C, but the optimum range lies between 17° and 22° C. This coincides with the temperature range of the permanent thermocline. In fact, in the tropical western and central Pacific, major concentrations of *T. obesus* are closely related to seasonal and climatic changes in surface temperature and thermocline. Juveniles and small adults of bigeye tuna school at the surface in mono-species groups or together with yellowfin tuna and/or skipjack. Schools may be associated with floating objects.

Growth & Average Maximum Size

The maximum fork length is over 200 cm; common to 180 cm (corresponding to an age of at least 3 years). The all-tackle angling record for the Pacific is a 197.3 kg fish from off Cabo Blanco, Peru in 1957. This fish was 236 cm long but it was not specified whether this pertained to fork length or total length. For the Atlantic, the all-tackle angling record is a 170.3 kg fish with a fork length of 206 cm taken off Ocean City, Maryland, USA in 1977. Maturity seems to be attained at 100 to 130 cm fork length in the eastern Pacific and in the Indian Ocean, and at about 130 cm in the central Pacific.

Reproduction

Mature fish spawn at least twice a year; the number of eggs per spawning has been estimated at 2.9 million to 6.3 million. In the eastern Pacific some spawning is recorded between 10° N and 10° S throughout the year, with a peak from April through September in the northern hemisphere and between January and March in the southern hemisphere. Kume (1967) found a correlation between the occurrence of sexually inactive bigeye tuna and a decrease of surface temperature below 23° or 24° C.

Maturity

50% maturity occurs when both females and males are 3 years, 100 cm. Spawning season from December to January and also in June in the eastern Indian Ocean.

Prey and Predators

The food spectrum of bigeye tuna covers a variety of fish species, cephalopods and crustaceans, thus not diverging significantly from that of other similar-sized tunas. Feeding occurs in daytime as well as at night. The main predators are large billfish and toothed whales.

3.3.3.3 Stock Status

The most recently agreed stock status estimate is based on the base case stock assessment conducted at the Fifteenth Session of the IOTC Working Party on Tropical Tunas held in San Sebastian, Spain, 23–28 October 2013. Report IOTC–2013–WPTT15–R[E].

The 2013 Bigeye stock assessment model results did not differ substantively from the previous (2010 and 2011) assessments; however, the final overall estimates of stock status differ somewhat due to the revision of the catch history and updated standardised CPUE indices. All the runs (except 2 extremes) carried out in 2013 indicate the stock is above a biomass level that would produce MSY in the long term (i.e. SB2012/SBMSY > 1) and in all runs that current fishing mortality is below the MSY-based reference level (i.e. F2012/FMSY < 1).

The stock is classified as not overfished (SByear/SBMSY≥ 1) and not subject to overfishing (Fyear/FMSY≤ 1).

- Catches in 2012 (≈115,800 t) remain lower than the estimated MSY values from the 2013 stock assessments. The average catch over the previous five years (2008–12; ≈107,600 t) also remains below the estimated MSY. In 2012 catch levels of bigeye tuna increased markedly (~24% over values in 2011), especially longline catches.
- The median value of MSY from the model runs investigated was 132,000 t with a range between 98,000 and 207,000 t.
- Current spawning stock biomass was estimated to be 40% of the unfished levels.
- On the weight of stock status evidence available, the bigeye tuna stock is therefore not overfished, and is not subject to overfishing.
- Declines in longline effort since 2007, particularly from the Japanese, Taiwan, China and Republic of Korea longline fleets, as well as purse seine effort have lowered the pressure on the Indian Ocean bigeye tuna stock, indicating that current fishing mortality would not reduce the population to an overfished state in the near future.

Table 3.3.7 Bigeye tuna: key management quantities from the SS3 assessment, for the aggregate Indian Ocean

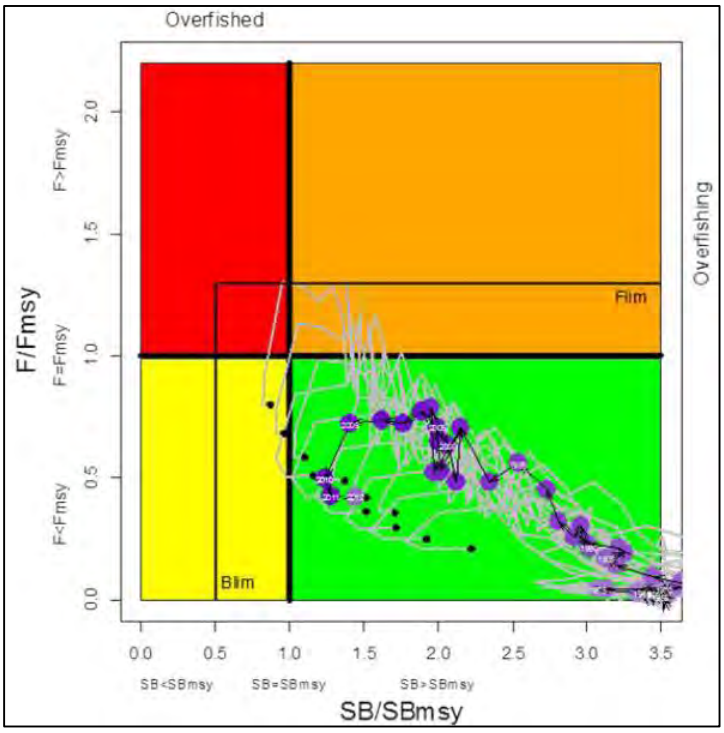
Management Quantity	Aggregate Indian Ocean
2012 catch estimate	115,793 t
Mean catch from 2008–2012	107,603 t
MSY [plausible range]	132,000 [98,000–207,000]
Data period used in assessment	1952–2012
F_{2012}/F_{MSY} [plausible range]	0.42 [0.21–0.80]
B_{2012}/B_{MSY}	n.a.
SB_{2012}/SB_{MSY} [plausible range]	1.44 [0.87–2.22]
B_{2012}/B_{1952}	n.a.
SB_{2012}/SB_{1952} [plausible range]	0.40 [0.27–0.54]
$B_{2012}/B_{2012,\,F=0}$	n.a.
$SB_{2012}/SB_{2012,\,F=0}$	0.40 [0.27–0.54]

Source: IOTC

Kobe Plot:

The Kobe Plot shows stock status in relation to both spawning biomass (B) and fishing mortality rate (F) relative to Maximum Sustainable Yield (MSY).

Figure 3.3.8 Bigeye tuna: SS3 Aggregated Indian Ocean assessment Kobe plot.



Source: IOTC

The Kobe Plot shows stock status in relation to both spawning biomass (B) and fishing mortality rate (F) relative to Maximum Sustainable Yield (MSY). In this case it presents the trajectories for the range of 12 plausible model options included in the formulation of the final management advice (grey lines with the black point representing the terminal year of 2012). The trajectory of the median of the 12 plausible model options (purple points) is also presented.

The interim biomass (B_{LIM}) and fishing mortality limit (F_{LIM}) reference points are shown. The targets (B_{MSY} and F_{MSY}) and limits (B_{LIM} = 0.50 B_{MSY} and F_{LIM} = 1.30 F_{MSY}) were accepted as interim by the IOTC resolution 13/10.

Summary Table 5 in IOTC–2013–WPTT15 (shown above) gives the value of SB_{2012} /SB_{MSY} as 1.44 with 95% confidence intervals of 0.87 – 2.22; and the value of F_{2012}/ F_{MSY} as 0.42 with 95% confidence intervals of 0.21-0.80. The median estimate of SB_{2012} relative to its unfished state, $SB_{2012,\ F\ =\ 0}$, is estimated to be 0.40 with 95% confidence intervals of 0.27-0.54.

Table 3.3.8 Bigeye tuna: 2011 MULTIFAN-CL Indian Ocean bigeye tuna stock assessment Kobe II Strategy Matrix. Percentage probability of violating the MSY-based reference points for five constant catch projections (2010 catch level, ± 20% and ± 40%) projected for 5 and 12 years

Reference point and projection timeframe	Alternative catch projections (relative to 2012) and weighted probability (%) scenarios that violate reference point				
	100% (115,800 t)	110% (127,400 t)	120% (139,000 t)	130% (150,500 t)	140% (162,100 t)
$SB_{2015} < SB_{MSY}$	0	0	0	0	0
$F_{2015} > MSY$	0	0	0	8	17
$SB_{2022} < SB_{MSY}$	0	0	8	17	25
$F_{2022} > MSY$	0	0	8	17	25

Source: IOTC

Concerning the uncertainty associated with the stock status the kobe plot shows that, for the 12 plausible model options considered, in all but two cases B> B_{MSY} and F< F_{MSY}. It is also indicated that over the last decade B relative to B_{MSY} is tracking downwards while F relative to F_{MSY} has increased slightly.

In considering stock status it is prudent to consider stock biomass in relation to both the point at which recruitment might be impaired as well as the target stock level. Concerning the point at which recruitment might be impaired it is difficult, if not impossible, to determine unless it has already been breached. In the case of bigeye tuna however there is no evidence for recruitment impairment.

Concerning the target stock level, and noting that while B_{MSY}, B_{2010}, and B_0 are unknown, both SB_{2012}/SB_{1952} (=SB_0) = 0.4 [0.27 – 0.54] and SB_{2012}/SB_{MSY} = 1.44 [0.87 – 2.22] have been determined. Based on these values the best estimate of SB_{MSY}/SB_0 is 0.28. Resolution 13/10 provides that B_{LIM} = 0.50 B_{MSY} implying an SB_{LIM}/SB_0 of 0.14. Noting CB2.3.3.4, a value of 0.21, (B_{LIM} = 0.75 B_{MSY}) might be more prudent.

However, even against this more conservative (but consistent with CB2.3.3.4) standard the base case median estimate of SB relative to its unfished state is 0.40 [0.27-0.38], where even the lower 95% confidence bound is well above the default value of 0.21. Therefore, taking account of the uncertainty associated with the base case status estimates, there is a high degree of certainty (i.e. greater than 95%, as set out in MSC CR CB2.2.1.3) that the stock is above the point where recruitment would be impaired – the default value for this being around 50% of the BMSY level.

The current estimate of SB_{2012}/SB_{MSY} is 1.44 [0.87 – 2.22]. When other model approaches are used, as shown in the Kobe plot, the high degree of confidence is maintained. That is, a) the Kobe plot shows that, based on the trajectory of the median of 12 plausible model options (purple points) the stock has always been above the target level; and b) based on the trajectory of the all 12 plausible model options there is no evidence to suggest that the stock has not been above *or fluctuating* around the target in recent years. The latter is necessary in order to have a high degree of certainty i.e. greater than 95%, as set out in MSC CR CB2.2.1.3.

3.3.3.4 Reference Points

In resolution 13/10 the IOTC adopted interim target (B_{MSY} and F_{MSY}) and limit (B_{LIM} = 0.50 B_{MSY} and F_{LIM} = 1.30 F_{MSY}) reference points for bigeye tuna. The resolution specifies that the IOTC Scientific Committee should assess stocks against these reference points and provide advice against them, as

is done both in tabular form and using Kobe process presentations. The resolution also calls on the Scientific Committee to further investigate reference points and Harvest Control Rules (HCR) using Management Strategy Evaluation (MSE). Stock assessments for bigeye are well advanced (see IOTC–2013–WPTT15) and though results are uncertain the influence of alternative assumptions and model approaches is well explored. That being said, in 2013 the WPTT noted that the proportion of bigeye tuna catches by purse seine from free schools had increased. Given that bigeye tuna forming free schools are adult fish with a size range similar to that found in longline catches, such changes in fishing patters can impact and change reference points through changes in yield-per-recruit. Indeed small changes in fishing pattern can lead to large changes in absolute levels of reference points (especially B_{MSY}) and care is needed to interpret status from year to year. Constant B_{year}/B_{MSY} does not necessarily imply a constant B. While these issues are not peculiar to bigeye, as fishing patterns are known to be changing care is needed in framing advice. It should be noted, however, that as the change in fishing pattern appears to be away from smaller and towards larger fish constant B_{year}/B_{MSY} would imply an improved stock status.

In summary, the target reference points have been set as ratios: B/B_{MSY} and F/F_{MSY}. This is reasonable and consistent with practice elsewhere as well as with MSC requirements. The reference points are estimated based on MSY and are appropriate for tuna stocks. MSY is estimated within the stock assessment and reported to the management system. The relation of the stock relative to MSY is reported as part of the determination of stock status.

Resolution 13/10 sets interim target (B_{MSY} and F_{MSY}) and limit (B_{LIM} = 0.50 B_{MSY} and F_{LIM} = 1.30 F_{MSY}) reference points for bigeye tuna. No rationale is available to support these choices. As noted earlier, while B_{MSY}, B_{2012}, and B_{1952} (=B_0) are unknown, both SB_{2012}/SB_{1952} (=SB_0) = 0.4 [0.27 – 0.54] and SB_{2012}/SB_{MSY} = 1.44 [0.87 – 2.22] have been determined. Based on these values the best estimate of SB_{MSY}/SB_0 is 0.28. Resolution 13/10 provides that B_{LIM} = 0.50 B_{MSY} implying an SB_{LIM}/SB_0 of 0.14. This is a low value to use without explanation and appears inconsistent with MSC requirements that specify that if the target reference point is analytically determined to be below 40% B_0, and there is no analytically determined limit reference point, then the default value of B_{lim} should be 20% B0. Alternatively, were SB_{MSY}/SB_0 < 0.27 then the default LRP should be 75%B_{MSY} implying SB_{LIM}/SB_0 = 0.21. Although the IOTC has yet to adopt a specific limit reference point, management advice is provided relative to MSY as a target. The default 50% BMSY is assumed here for purposes of defining stock status.

Here, with evidence of changing fishing patterns in recent years, the use of ratios can mask underlying changes in absolute values of B_{MSY} and F_{MSY}. The implied B_{lim} of 14%B_0 is below the default certification requirement of 20% B_0. There is, however, no indication of impaired recruitment to date. The reference points in use are interim and work is planned to refine them using MSE to evaluate reference points and HCR. Clearly the intention of the IOTC (management response) and the basis on which scientific advice is supplied is to maintain the stock at or above the MSY level. Therefore, although an interim target reference point is defined at a level consistent with B_{MSY} – a more precise definition justified through scientific analysis and research would be necessary before the higher guidepost could be met.

3.3.3.5 Harvest Strategy

In resolution 12/01 the IOTC agrees to apply the precautionary approach, in accordance with relevant internationally agreed standards, in particular with the guidelines set forth in the UNFSA, and to ensure the sustainable utilisation of fisheries resources as set forth in Article V of the IOTC Agreement. Further, in applying the precautionary approach, the IOTC has agreed:

1. That the Commission shall adopt, after due consideration of the advice supplied by the IOTC Scientific Committee, a) stock-specific reference points (including, but not necessarily limited to, target and limit reference points), relative to fishing mortality and biomass, and b) associated harvest control rules, that is, management actions to be taken as the reference points for stock status are approached or if they are breached.
2. That reference points and harvest control rules shall be determined so that, according to the best available science, the risk of a negative impact on the sustainability of Indian Ocean resources of tuna and tuna-like species is minimised.
3. That in the determination of appropriate reference points and harvest control rules, consideration must be given to major uncertainties, including the uncertainty about the status

of the stocks relative to the reference points, uncertainty about biological, environmental and socio-economic events and the effects of fishing activities on non-target and associated or dependent species.

4. That if an unanticipated event, such as a natural phenomenon has a significant adverse impact on the status of a stock or its associated environment, the Commission shall adopt Conservation and Management Measures on an emergency basis to ensure that fishing activity does not exacerbate such adverse impacts.
5. That initially and as an interim measure, the Commission may adopt provisional reference points and harvest control rules, taking into account the advice of the IOTC Scientific Committee; such measures would remain current until such time as the Commission chooses to update them.
6. That it will instruct the IOTC Scientific Committee to assess, through the management strategy evaluation process, the performance of reference points, including any interim reference points, and of potential harvest control rules to be applied as the status of the stocks approaches the reference points.
7. And that after completion of the management strategy evaluation, the IOTC Scientific Committee should provide the Commission with recommended reference points for all major stocks, and cast future advice on the status of the stocks relative to the adopted reference points, on the basis of the best available scientific evidence.
8. Finally, that the IOTC Scientific Committee will report on the progress of the management strategy evaluation process

Given that resolution 13/10 has set interim target (B_{MSY} and F_{MSY}) and limit (B_{LIM} = 0.50 B_{MSY} and F_{LIM} = 1.30 F_{MSY}) reference points for bigeye tuna, then resolution 12/01 may be taken to provide context for an overall harvest strategy including the intention that management responses ultimately be guided by HCRs once determined using MSE. For example, the 12/01 framework specifies that consideration must be given to major uncertainties, including the uncertainty about the status of the stocks relative to the reference points, uncertainty about biological, environmental and socio-economic events and the effects of fishing activities on non-target and associated or dependent species and that if an unanticipated event, such as a natural phenomenon has a significant adverse impact on the status of a stock or its associated environment, the Commission shall adopt Conservation and Management Measures on an emergency basis to ensure that fishing activity does not exacerbate such adverse impacts.

The overall effect, therefore, of resolutions 12/01 and 13/10 is to provide interim elements of the final harvest strategy that are clearly intended to ensure that the stock is maintained around the target reference points (B_{MSY} and F_{MSY}). In that sense then, the intention of resolutions 12/01 and 13/10 are consistent with appropriate management; they provide a framework that is well known from other fisheries where it has proven effective. There is no reason to believe that it would be any less effective here if strictly applied.

Similarly, scientific advice has been formulated relative to a harvest strategy which is, in turn, relative to MSY reference points. This is responsive to that state of the stock and to limit and target reference points commonly used for bigeye and other tropical tunas, meeting the SG80. However, because the strategy is not clearly defined but, rather is “implied.” and it is unclear whether the harvest strategy will be successful. Therefore, the designed aspect of the strategy to change overall selectivity cannot be given full credit in the assessment.

It is clear from the report of the WPTT that while the harvest strategy may not have been fully tested, none the less, monitoring is in place. Further it is evident from the most recent assessment that for this stock a) the catch is below MSY, b) the stock is overfished. This indicates that overall controls on the exploitation of this stock have been adequate to date and the harvest strategy is achieving its objectives. This meets the SG80. That being said, and in the absence of direct evidence or the results of a full MSE, there is not specific evidence that the harvest strategy will work in practice under different circumstances. That is, it has not be full evaluated and there is no specific evidence exists to show that it is achieving its objectives (including being clearly able to maintain stocks at target levels). Further there is no pre-agreement on how to react to stock changes and stock assessments required to evaluate management performance are not frequent

- given the stock is heavily exploited. It has yet to be shown that the management system can maintain stock at the target level (B>BMSY, F<FMSY).

The work of the WPTT provides clear evidence that monitoring of this stock is adequate to determine whether the harvest strategy is working. The different parts of the strategy include maintaining both B/B_{MSY} and F/F_{MSY}. Data are collected to estimate these quantities and updates and assessments conducted. The latter reports best estimates of biomass, which indicates whether management is achieving its objectives or not. That being said there is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible.

3.3.3.6 Harvest Control Rules & Tools

Whereas the overall effect of resolutions 12/01 and 13/10 is to provide interim elements of the final harvest strategy that are clearly intended to ensure that the stock is maintained around the target reference points (BMSY and FMSY) the strategy is not fully specified. Further, and noting that Harvest Control Rules are a separate component of any harvest strategy, again Harvest Control Rules are implied rather than explicitly specified. In other words the interim framework does lay out general management aims. It does this by agreeing its intention that the IOTC Scientific Committee will recommend to the Commission HCRs, which among other factors, taking account of the following objectives:

- For stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant;
- For stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible;
- For stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible;
- For stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible.

Though poorly defined in its current form, resolution 13/10 none-the-less can be said provide a framework that is well known from other fisheries where it has proven effective. Therefore on that basis, then, it must be concluded that there are “generally understood harvest control rules in place consistent with the harvest strategy”.

Apart from clearly defined HCRs, an effective management strategy must also have in place effective tools that ensure effective implementation of any decision taken as part of strategy whether catch or effort limits, closed areas, technical conservation measures etc. Currently the tools provided in respect of big eye include:

- Resolution 13/03 on the recording of catch and effort by fishing vessels in the IOTC area of competence
- Resolution 13/07 concerning a record of licensed foreign vessels fishing for IOTC species in the IOTC area of competence and access agreement information
- Resolution 13/10 On interim target and limit reference points and a decision framework
- Resolution 13/11 On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna and a recommendation for non-targeted species caught by purse seine vessels in the IOTC area of competence
- Resolution 12/11 on the implementation of a limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties
- Resolution 12/13 for the conservation and management of tropical tunas stocks in the IOTC area of competence.
- Resolution 10/02 mandatory statistical requirements for IOTC Members and Co-operating non-Contracting Parties (CPC’s) Resolution 10/08 concerning a record of active vessels fishing for tunas and swordfish in the IOTC area

And while it is not entirely clear if these measures are adequate to fully implement and enforce an effective harvest strategy, with the stock moving towards the biomass target reference point adopted in resolution 13/10, (B/ BMSY), it is evident that IOTC has started to investigate and develop other steps to control fishing. These include:

- An ongoing process to develop a catch allocation scheme based on already developed allocation principles. IOTC-2011-SS4-Prop A[E], IOTC-2011-SS4-Prop B[E], IOTC-2013-TCAC02-R[E]) clearly demonstrate the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction. This is further emphasised by IOTC RES 12/13 which explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ.

- Explicit HCRs for skipjack are currently under development using a well-specified MSE approach.

- It is also the case that

  - IOTC has demonstrated the technical ability to implement spatial/temporal closures.

  - IOTC RES12/11 is aimed at determining fishing capacity for all IOTC Contracting Parties and Cooperating Non-Contracting Parties, and ensuring that capacity is not increased. The effectiveness of the provision is due for consideration in 2014.

Collectively these provide evidence that the IOTC intends to implement HCRs once fully developed. Further, various tools are in place or are being developed. The likely tools to be put in use when needed include spatial and temporal closures to improve exploitation pattern and quotas allocated between states. These tools are proven to be effective in other settings if implemented appropriately.

In summary;

Harvest control rules for this stock are not well-defined and there is no specific plan of control if the stock size falls below the trigger point (MSY). There is, however, evidence of an intention to end overfishing and rebuild this stock should depletion occur and the scientific committee is called on to provide such advice. Therefore there are generally understood harvest rules in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached meeting the SG60. However these are neither well defined nor have they been tested to ensure that the exploitation rate is reduced as limit reference points are approached; consequently the SG80 is not met.

As the current, interim, framework does not include well defined harvest control rules or specific guidance on management it then it cannot be said that selection of the harvest control rules takes into account the main uncertainties. Rather it must be concluded that the SG80 has not been met.

As the biomass of this stock has, to date, remained above the target reference point there has not been any occasion where a level of control to respond to excess fishing pressure however has been demonstrated. That being said, resolution 12/13 (for the conservation and management of tropical tunas stocks in the IOTC area of competence) is applicable in 2011, 2012, 2013 and 2014 to all vessels of 24 meters overall length and over, and under 24 meters if they fish outside their EEZ, fishing within the IOTC area of competence.

This resolution requires that with a view to decreasing the pressure on the main targeted stocks and in particular on the yellowfin tuna and bigeye tuna in the IOTC area of competence for the years 2011, 2012, 2013 and 2014, the area bounded by 0 ° - 10° North 40° and 60° East will be closed for longline vessels in each year from 0000 hours on 1 February to 2400 hours on 1 March, and for purse-seine vessels in each year from 0000 hours on 1 November to 2400 hours on 1 December:

Thus the tools that the IOTC have available include TACs, area access and other measures. The IOTC has begun to develop allocation mechanisms for both TACs and access agreements and the Scientific Committee has initiated the process of control rule development. There is some evidence that some IOTC members have controlled their own catches in an effective manner, meeting the SG60. Nevertheless, there are as of yet no harvest control rules at the IOTC level and, thus, no evidence that the tools are effective, so the SG80 cannot be met.

3.3.3.7 Information & Monitoring

Section 7 of IOTC–2013–WPTT15–R[E] provides a comprehensive overview of the data available to the scientific assessment of this stock. Mindful that both the interim reference points (target and limit), and consequently, the current view of the status of the stock relative to those reference points depend on the quality of the assessment it is essential that the data provided are both comprehensive and of suitable quality.

- The IOTC Secretariat collate and supply to the WPTT with a range of data and statistics collated from inputs from IOTC Members and Cooperating non-Contracting Parties (CPC's), as required by resolution 10/02 (Mandatory statistical requirements for IOTC Members and Cooperating non-Contracting Parties (CPC's), for the period 1950–2011). Details are provided in detailed in paper IOTC–2013–WPTT15–07.
- IOTC–2013–WPTT15–07 provides a range of fishery indicators, including catch and effort trends for fisheries catching bigeye tuna in the IOTC area of competence. It also covers data on nominal catches (fishery removals), catch-and effort, size-frequency and other data, in particular release and recapture (tagging) data.
- There is also a comprehensive analysis of the main issues which the Secretariat considers affect the quality of the statistics available at the IOTC, by type of dataset and type of fishery. [IOTC–2013–WPTT15–07 Rev_1]. This analysis includes issues pertaining to Catch-and-Effort data from coastal fisheries, and from surface and longline fisheries; size data; and, biological data.
- There is comprehensive reporting by the WPTT of the efforts taken to ensure the quality of all data used in the assessment is critically analysed.
- In their review of new information on the biology, ecology, stock structure, their fisheries and associated environmental data for bigeye tuna, the WPTT provide examples of the efforts undertaken to ensure that relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.

It is evident form the information reported by the WPTT that considerable, relevant, information related to (a) stock structure, (c) fleet composition (d) stock abundance (mainly standardised CPUE series) (e) fishery removals, and (f) other data are available to support the stack assessment and, thereafter, the harvest strategy.

- Monitoring indices from several fleets' standardized CPUE and from tagging data are adequate for the harvest strategy.
- While indicators of stock abundance - mainly standardised catch-per-unit-effort indices are available, a single consistent index is not available for the entire time series. However, the combined indices do appear to provide information on the change in abundance that has occurred.

In summary, bigeye tuna data in the Indian Ocean are comprehensive, informative and relevant. These data consider (a) stock structure, (c) fleet composition (d) stock abundance (mainly standardised CPUE series) (e) fishery removals, and (f) other data and provide information on the spatial distribution of catches, their size frequencies, results of tagging studies as well as growth and mortality models. The data are adequate to allow appropriate stock assessments and to evaluate the status of the stock against target and limit reference points. In addition environmental data are used in CPUE standardization and to help explain recruitment. Stock structure data while limited are consistent with an Indian Ocean-wide stock.

Overall, data are adequate for stock assessment and for an appropriate harvest control rule, and thus meet the SG80.

However, despite the best efforts of the IOTC secretariat it remains the case that i) issues remain with some of these data and ii) there are information gaps such that it cannot be concluded that this information constitutes a comprehensive range of information. Consequently the data do not presently allow the implied harvest control rule to be applied with a high degree of certainty, so the SG100 is not met.

IOTC has put considerable effort into the reporting and recording of catches by the contracting parties. These are summarised in the following resolutions:

- 13/03 On the recording of catch and effort data by fishing vessels in the IOTC area of competence
- 11/04 On a regional observer scheme
- 10/02 Mandatory statistical requirements for IOTC Members & Cooperating Non-Contracting Parties
- 10/08 Concerning a record of active vessels fishing for tunas and swordfish in the IOTC area
- 10/09 Concerning the functions of the Compliance Committee
- 06/03 On establishing a vessel monitoring system programme
- 03/03 Concerning the amendment of the forms of the IOTC statistical documents

The IOTC secretariat puts considerable effort into considering any issues identified relating to the statistics of tropical tunas. This list covers the main issues which the Secretariat considers affect the quality of the statistics available at the IOTC, by type of dataset and type of fishery. Specifically it includes issues relating to non-reporting of fishery removals and attempts to rectify or estimate these.

Standardized CPUE indices are available from several fleets. Tagging data is also available. Together these are considered are adequate for the harvest strategy.

While indicators of stock abundance - mainly standardised catch-per-unit-effort indices – are available, a single index covering the entire time series is not available.

IOTC Resolution 13/03 requires that all purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres length overall and those under 24 metres if they fish outside the EEZs of their flag States within the IOTC area of competence to keep a bound paper or electronic logbook and to record, inter alia, the weight (kg) or number by species per set/shot/fishing event for each of a comprehensive list of species. For purse seine, these include IOTC species, marine turtles, marine mammals, sharks, rays and other bony fish.

It is apparent that IOTC has put considerable effort into the recording and reporting of catches and that the current level of reporting is adequate given the large number of small countries involved and the difficult task of monitoring small vessels often far away or on the high seas.

3.3.3.8 Stock Assessment

A range of quantitative modelling methods (ASAP, ASPM and SS3) were applied to bigeye tuna in 2013 with management advice based on the range of results from the SS3 models. The SS3 results were preferred to the other assessment platforms (ASPM and ASAP) because a more comprehensive range of model options were investigated and a range of diagnostics indicated that the models represented a reasonable fit to the main datasets.

The range of plausible SS3 model options was considered to adequately represent the range of uncertainty in the assessment. Integrating across all outcomes, the 2013 stock assessment model results did not differ substantively from the previous (2010 and 2011) assessments or amongst the models applied, although, the final overall estimates of stock status differ somewhat due to the revision of the catch history, new information, and updated standardised CPUE indices.

All the runs (except 2 extremes) carried out in 2013 indicate that the stock is above a biomass level that would produce MSY in the long term (i.e. SB2012/SBMSY > 1) and in all runs that current fishing mortality is below the MSY-based reference level (i.e. F2012/FMSY < 1).

Table 3.3.9. Bigeye tuna: summary of final stock assessment model features as applied in 2013

Bigeye tuna: Summary of final stock assessment model features as applied in 2013.

Model feature	ASAP	ASPM	SS3
Software availability	NMFS toolbox	*	NMFS toolbox
Population spatial structure / areas	1	1	1
Number CPUE Series	2	1	1
Uses Catch-at-length/age	Yes (CAA)	Yes (CAA)	Yes
Uses tagging data	No	No	No
Age-structured	Yes	Yes	Yes
Sex-structured	No	No	No
Number of Fleets	7	5	12
Stochastic Recruitment	Yes	Yes	Yes

Source: IOTC

Sensitivity testing is extensive, including of model structure, and uncertainty is reasonably explored although model outputs for management are presented only as simple point estimates with confidence intervals, as point estimate trajectories on Kobe Plots and as a KOBE II Strategy Matrix. These displays may not convey the full uncertainty to managers.

In summary, a variety of methods including ASAP, ASPM and SS3 have been used to model this stock. It is clear that care has been taken to ensure that the assessment is appropriate for the stock and for the harvest strategy (and implied HCRs) and takes into account the major features relevant to the biology of the species and the nature of the fishery. Alternative models are explored. Overall the assessment is appropriate for the stock and for the harvest control rule. However there remain issues with some parameters that could impact the current of stock status. As such the assessment does not take into account all major features relevant to biology of the species and the nature of the fishery and this is reflected in the scoring under the assessment.

The assessment estimates stock status relative to reference points and SB2012/SBMSY (rather than B2012/BMSY) and F2010/FMSY are presented as point estimates with 95% confidence intervals, meeting the SG60.

IOTC–2013–WPTT15 Reports that the WPTT NOTED that a range of quantitative modelling methods (ASAP, ASPM and SS3) were applied to bigeye tuna in 2013 and provide an overview of the key features of each of the three stock assessments a summary of the assessment results. The WPTT also noted the value of comparing different modelling approaches evaluating alternative hypothesis about the quality of the data used. Evaluating and validating the data is integral in the assessment, as fitting to alternative CPUE indices and assuming different model structures can have a large influence on the assessments.

Hence, stock assessment methods have been use report uncertainty in estimates of stock status. Likewise uncertainties have been examined as alternative model and the stock status associated with these alternatives have been evaluated in a probabilistic manner by weighting of the alternatives. While these weightings may not be rigorous they represent a consensus of experts on the relative importance. These have then been presented as Kobe plots and a Kobe strategy matrix. However, given the type of uncertainties in the model, it is not possible for the assessment to provide probabilistic management advice suitable to take account of risk. Therefore, the SG80 is met, but not the SG100.

While a range of quantitative modelling methods (ASAP, ASPM and SS3) were applied to bigeye tuna in 2013 – constituting a degree of testing – there has not been a systematic testing of the assessment. Nor have alternative hypotheses and assessment approaches have been rigorously explored.

The stock assessment of bigeye is primarily reviewed through the Working Party for Tropical Tunas of the IOTC's Scientific Committee. Additionally, outside experts are invited to participate in the Working Party meetings. Thus whereas there is clearly a degree of peer review, it is not clearly apparent that this review was externally reviewed as would be considered best practice.

3.3.4 Fisheries Management & IOTC

3.3.4.1 Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.

While harvest control rules for this stock are not well-defined, IOTC resolution 13/10 does provide an interim harvest control framework and implied, generally understood, harvest rules, as follows.

Paragraph 1 of IOTC resolution 13/10 specifies that when assessing stock status and providing recommendations to the Commission, the IOTC Scientific Committee should apply the interim target and limit reference points set out in table 1 to that resolution (below):

Table 3.3.10: Interim target and limit reference points

Table 1. Interim target and limit reference points.

Stock	Target Reference Point	Limit Reference Point
Albacore	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$
Bigeye tuna	B_{MSY}; F_{MSY}	$B_{LIM} = 0.50\ B_{MSY}$; $F_{LIM} = 1.30\ F_{MSY}$
Skipjack tuna	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.50\ F_{MSY}$
Yellowfin tuna	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$
Swordfish	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$

Table reproduced from IOTC resolution 13/10 on interim target and limit reference points and a decision framework.

BMSY refers to the biomass level for the stock that would produce Maximum Sustainable Yield while FMSY refers to the level of fishing mortality that produces MSY.

IOTC resolution 13/10 also requires that the IOTC Scientific Committee should endeavour to apply the interim reference points in the provision of advice on the status of stocks as well as when making recommendations for management measures.

While the resolution does not explicitly define overfishing, the latter is implicitly defined as $F/F_{MSY} > 1$. Similarly, the resolution does not explicitly define overfished, but, implicitly as B/BMSY < 1.

At paragraph 4 of IOTC resolution 13/10, the interim framework provides guidance on management aims if target reference points are breached. These require that the IOTC Scientific Committee develop and assess potential harvest control rules. And while this work is ongoing, and final HCRs do not therefore yet exist, the objectives of the management strategy are established. These are set out in paragraph 4 of resolution 13/10 as follows:

HCRs will take account of the following objectives:

- For stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant;
- For stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible;
- For stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible;
- For stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible.

It is clear that whereas the IOTC wish to achieve – through a process of full Management Strategy Evaluation – a set of robust HCRs, there is nothing in the resolution to prevent the application of the objectives immediately. On the contrary, paragraph 2 requires that the IOTC Scientific Committee

should endeavour to apply the interim reference points in the provision of recommendations for management measures. Further, paragraph 4 specifies that if a stock is neither overfished (that is Bcurrent /BMSY > 1) nor experiencing overfishing (that is Fcurrent/FMSY < 1), then the IOTC Scientific Committee should provide recommendations for management measures that aim at maintaining the stocks thus with a high probability, and, if this is not the case, then the resolution obliges the Scientific Committee to provide recommendations for management measures that, as necessary, ensure overfishing is ended with a high probability in as short a period as possible and/or stocks are rebuilt in as short a period as possible.

Therefore, depending on the status of the stock relative to reference points, certain outcomes are required with high probability. And while there is no detailed plan of control if the stock size falls below the trigger point (MSY) there is, clearly, evidence of an intention to end overfishing and rebuild this stock should depletion occur. The scientific committee is called on to provide such advice and to recommend controls on harvesting in a clearly defined way. These then are, generally understood harvest control rules.

In summary

IOTC RES 13/10 specifies both an interim framework for management based on the stock status relative to Target and Limit Reference Points as well as providing objectives to be taken into account by the IOTC Scientific Committee when providing stock advice and making management recommendations.

Together these constitute generally understood harvest rules that are consistent with a harvest strategy.

The objectives set in resolution IOTC RES 13/10 are clearly intended to reduce the exploitation rate as target reference points are exceeded and to further reduce the exploitation rate as limit reference points are approached with the aim of ending overfishing with a high probability in as short a period as possible;

Conclusion: There are, generally understood rules in place consistent with the harvest strategy, meeting SG60 scoring criteria. However these are, as yet, neither well defined nor have they been tested to ensure that the exploitation rate is reduced as limit reference points are approached; consequently the SG80 is not met.

3.3.4.2 Evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation

The IOTC was established at the 105th Session of the Council of the Food and Agriculture Organization of the United Nations (FAO) in 1993. As such the IOTC Members can make decisions concerning the management of tuna and tuna-like resources and their associated environment binding on all Members and Cooperating non-Contracting Parties.

And while the Agreement was signed in 1993 it did not enter into force until March 27th 1996 on the accession of the tenth IOTC Contracting Party. This latter point is important for when, at the 6th session of the IOTC in 2001, the first resolution setting out management measures designed to limit fishing effort was introduced, it was a mere 5 years later.

Resolution 01/04 sought to limit the fishing effort of vessels fishing bigeye tuna, and requested non-Members of IOTC to reduce their fishing effort in 2002 in relation to 1999 levels. It also provided for a review, at the 2002 Session, of the measures taken by non-Members to implement these reductions.

Other resolutions followed. At the 8th session of the IOTC in 2003, resolution 03/01 was introduced. Once again this was concerned with limiting the fishing capacity but this time of all contracting parties and cooperating non-contracting parties alike. In its introduction, resolution 03/01 noted the recommendation from the Scientific Committee “that a reduction in catches of bigeye tuna from all gears should be implemented as soon as possible; that the stock of yellowfin tuna is being exploited close to, or possibly above MSY; and that the level of fishing effort of swordfish should not be increased”. This resolution also cited the FAO International Plan of Action for the Management of the Fishing Capacity (IPOA) which provides that "States and Regional Fisheries Organisations confronted with an

overcapacity problem, where capacity is undermining achievement of long-term sustainability outcomes, should endeavour initially to limit at present level and progressively reduce the fishing capacity applied to affected fisheries". It is thus very clear that resolution 03/01, when introduced, was intended as a tool to control harvest rates (i.e. fishing effort). In that sense, therefore, it must be considered a tool to implement a harvest control rule.

The principle measure introduced in the 2003 resolution was a limit, applicable in 2004, 2005 and 2006, on the number of fishing vessels larger than 24 meters length overall. This was based on the number of such vessels registered in 2003 as a reference year. It applied to both contracting and cooperating non-contracting parties with more than 50 vessels on the 2003 IOTC Record of Vessels. It also ensured that the limitation on the number of vessels was commensurate with the corresponding overall tonnage expressed in both GRT (Gross Registered Tonnage) or GT (Gross Tonnage) and specified that, where vessels are replaced, the overall tonnage shall not be exceeded.

In this resolution the IOTC also sought to take note of the interests of developing coastal States, in particular 'small island' developing States and territories whose economies depend largely on fisheries. Special provision was made for such contracting and cooperating non-contracting parties which had the objective of developing their fleets above the authorisations foreseen. These were required to draw up fleet development plans in accordance with the provisions of Resolution 02/05 and to submit these plans to the IOTC for information. The FDPs defined, inter alia, the type, size and origin of the vessels and the programming of their introduction into the fisheries.

Three years later, in 2006, at the 10th session of the IOTC, resolution 06/05 extended the reach of the 2003 resolution to vessels less than 24 metres if they fished outside their flag state EEZ. Specifically in the years 2007, 2008 and 2009, both contracting and cooperating non-contracting parties were now required to limit (by gear type) the number of their vessels of 24 m overall length and over, and under 24 metres if they fished for tropical tunas in the IOTC Area outside their EEZ, to the number of their vessels notified to IOTC for 2006 in accordance with IOTC Resolution 05/04. The link with capacity in GRT (Gross Registered Tonnage) or in GT (Gross Tonnage) was maintained as were the special provisions for contracting parties which had the objective of developing their fleets above the authorisations foreseen; that is the Commission took note of the interests of the developing coastal States, in particular 'small island' developing States and territories whose economies depend largely on fisheries.

Three years later, in 2009, resolution 06/05 (which only applied until 2009) was duly superseded by resolution 09/02. This new resolution applied to the years 2010 and 2011. It also introduced two new concepts.

The first of these required that, within the period of application of the Resolution (2009 and 2010), CPCs could only change the number of their vessels, by gear type, provided that they could either demonstrate to the Commission (under the advice of the Scientific Committee) that the change in the number of vessels, by gear type, did not lead to an increase of fishing effort (E) on the fish stocks involved, or, that they were directly limiting catches using individual transferable quotas under a comprehensive national management plan which has been provided to the Commission. There is therefore now, for the first time, a link to F (from F = qE).

The second new provision introduced by resolution 06/05 required CPCs to ensure that, where there was a proposed transfer of capacity to their fleet, the vessels to be transferred had to be on either the IOTC Record of Vessels or on the Record of Vessels of another tuna Regional Fisheries Management Organizations. Specifically, no vessels on the List of IUU Vessels of any Regional Fisheries Management Organization could be transferred.

Finally, in 2012, resolution 09/02 (which only applied in 2010 and 2011) was itself superseded by resolution 12/11, this time applicable during the years 2012 and 2013. This kept all the key terms of the 2009 resolution (09/02) and critically retained the 2006 baseline for tropical tunas.

Once again it required Contracting Parties and Cooperating Non-Contracting Parties (CPCs) to notify the IOTC Secretariat, by 31 December 2009, the lists of vessels, by gear type, over 24 meters overall length and over, and under 24 meters if the fished outside their Exclusive Economic Zone (EEZ), and corresponding overall capacity in GT, which have actively fished in accordance with the provision of IOTC Resolution 07/04 [10/07, 10/08]; 10/07 [12/07, 13/07, 14/05] for tropical tunas during the year 2006.

It specifies (paragraph 3) that within the period of application of the Resolution, CPCs may only change the number of their vessels, by gear type, provided that they can either demonstrate to the Commission,

under the advice of the IOTC Scientific Committee that the change in the number of vessels, by gear type, does not lead to an increase of fishing effort on the fish stocks involved or where they are directly limiting catches using individual transferable quotas under a comprehensive national management plan which has been provided to the Commission.

CPCs are further required to ensure that where there is a proposed transfer of capacity to their fleet that the vessels to be transferred are on the IOTC Record of Vessels or on the Record of Vessels of other tuna Regional Fisheries Management Organisations.

No vessels on the List of IUU Vessels of any Regional Fisheries Management Organisation may be transferred.

Specific provision was also made for the implementation of fleet development plans. For CPCs which fail to introduce vessels in accordance with their Fleet Development Plans, the IOTC Compliance Committee and the Commission will give annual consideration to the related problems.

In addition the IOTC Compliance Committee is required to verify, at any IOTC Plenary Session, the compliance of CPCs with the provisions of this Resolution, including the implementation, according to the notified programming, of the Fleet Development Plans. (In relation to the latter, the Commission is also required to give due consideration to the interests of the developing coastal States, in particular small islands developing States and territories within the IOTC area of competence).

Finally, the limitation established by resolution 12/11 was to be applicable during the years 2012 and 2013. The IOTC undertook to review its implementation at the 2014 IOTC Session.

This review was prepared by the IOTC Secretariat, and presented on 26th April 2014 as document IOTC-2014-CoC11-05 Rev1[E] Report on the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating Non-Contracting Parties. The report summarised the information available to the Secretariat (in accordance with IOTC Resolution 12/11) to assist CPCs in assessing compliance with the limitation on fishing capacity, in particular with the provisions of paragraph 1 of the Resolution. Specifically it included tables that indicate the reference limits on fishing capacity based on the tonnage and number of vessels declared as active in 2006 for tropical tunas.

Table 3.3.11: Reference limits on fishing capacity based on the tonnage of vessels declared as active in 2006. Adapted from IOTC-2014-CoC11-05 Rev1[E]. Report on the implementation of a limitation of fishing capacity of contracting parties and cooperating non-contracting parties. Prepared by: IOTC Secretariat, 26 April, 2014

CPCs		A. Reference 2006	B. Planned FDPs 2007-2013	Reference capacity at 2013 (A+B)	Active capacity in 2013
Australia	(GRT)	3,312		3,312	3,265
Belize	(GT)		2,800	2,800	
China	(GT)	27,216		27,216	16,236
Comoros					
Eritrea					
European Union	(GT)	96,595		96,595	61,462
France (OT)	(GT)	4,638	7,994	12,632	13,770
Guinea	(GRT)	1,439		1,439	
India	(GRT)	32,950	4,200	37,150	*(12,379)*
Indonesia	(GT)	124,011	76,684	200,695	131,705
Iran	(GT)	83,524	35,153	118,677	102,529
Japan	(GT)	91,076		91,076	45,054
Kenya	(GT)				
Korea, Republic of	(GT)	15,274		15,274	7,657
Madagascar	(GT)	263	278	541	278
Malaysia	(GRT)	2,299	15,334	17,633	*(1488)*
Maldives	(GT)		856	856	2,373
Mauritius	(GRT)	1,931	21,657	23,588	*(9,152)*
Mozambique	(GT)				444
Oman	(GT)	3,126	8,318	11,444	*(7,212)*
Pakistan	(GT)	0	30,000	30,000	*(1,130)*
Philippines	(GRT)	10,304		10,304	4,961
Seychelles	(GT)	41,735	151,128	192,863	28,025
Sierra Leone					
Sri Lanka	(GT)	18,436	16,916	35,352	56,240
Sudan					
Tanzania	(GT)				1,535
Thailand	(GT)	13,771	18,500	32,271	4,678
U. K. (OT)	(GT)				
Vanuatu	(GT)		25,875	25,875	
Yemen					
Senegal	(GRT)	1,250			
South Africa	(GT)	3,013	3,056	6,069	*(4,660)*
Total	(GRT + GT)	**576,163**	**418,749**	**993,662**	**516,233**
Difference relative to 2006 Baseline				**172%**	**90%**

The report concluded "In relation to tropical tunas, the results indicate that the active capacity in 2013 (516,233 tons) has decreased relative to the baseline capacity of 2006 (576,163 tons), and it was just over half the reference limit capacity of 993,662 tons, that was expected for 2013. The lower than expected value is the results of reductions in capacity of most fleets, and also the failure of the majority of CPCs with a fleet development plan, to implement the plan".

Recalling that Paragraph 6 of resolution 12/11 allowed other CPCs develop their fleets in compliance with a properly introduced fleet development plan. This was IOTC taking note of the interests of the developing coastal States, in particular 'Small Island' developing States and territories whose economies depend largely on fisheries. However these plans were only valid if introduced to the IOTC by 31 December 2009 and were required to include inter alia, the type, size, gear and origin of the vessels intended as well as the programming (precise calendar for the forthcoming 10 years) of their introduction into the fisheries. As a consequence it is possible to calculate the total capacity increase envisaged in these fleet development plans: this amounted to 418,749 tonnes. As a consequence, the Reference Capacity for 2013 was no longer 576,163 tonnes but, instead, 993,662; or a total increase in the reference capacity (relative to the 2006 baseline) of some 172%. Against a backdrop of an increasing trend in F and a declining trend in B for the 3 main tropical species, yellowfin, skipjack and bigeye, such an increase seems incompatible with the principles of fisheries management. That being said, it is important to recall that 1) not alone did the active capacity not increase to the new reference capacity of 993,662 tonnes, on the contrary it declined by 10% relative to 2006 to 516,233 tonnes, and 2) further, had the capacity increased during the interval and had, as a consequence, the fishing

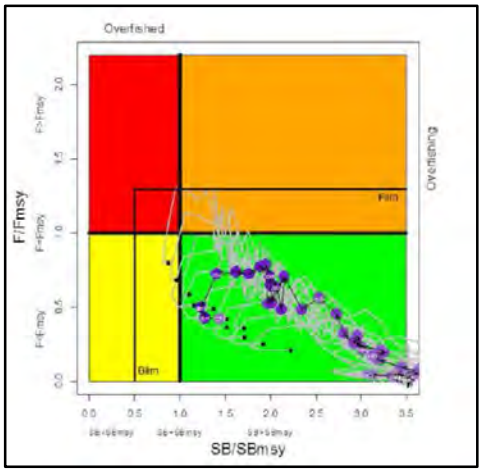
mortality increased in any of the year after 2006 such that Fyear>2006 > FMSY then under the terms of resolution 13/10 the IOTC Scientific Committee were required to apply the interim reference points in the provision of advice on the status of stocks as well as when making recommendations for management measures. In respect to the latter the IOTC Scientific Committee was required to take account of the specific objectives, namely that it aimed at ending overfishing with a high probability in as short a period as possible.

In other words, had the increased in capacity envisaged in the fleet development plans come about and had this resulted in overfishing then the IOTC Scientific Committee were required to make recommendations aimed at ending overfishing with a high probability.

Recalling that IOTC-2014-CoC11-05 Rev1[E] Report on the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating Non-Contracting Parties concluded “In relation to tropical tunas, the results indicate that the active capacity in 2013 (516,233 tons) has decreased relative to the baseline capacity of 2006 (576,163 tons), and it was just over half the reference limit capacity of 993,662 tons, that was expected for 2013.

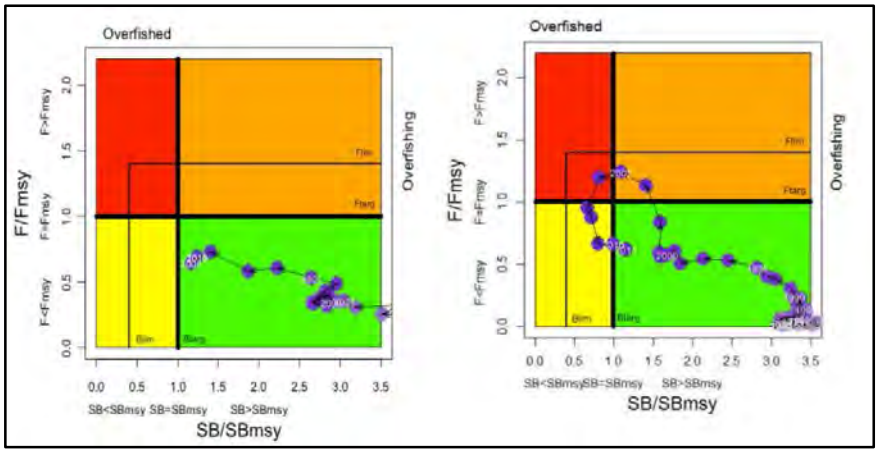
Further recalling that the latest assessment of the status of IOTC tropical stocks. And noting that in each case the diagram shows the temporal trend in the ratios Bcurrent /BMSY (x-axis) and Fcurrent /FMSY (y-axis). Purple circles represent the annual median values over time. Dots indicate uncertainty in the current status estimated from models that make different assumptions.

Figure 3.3.9 Bigeye tuna: The 2013 assessment conducted by the Scientific Committee gave similar tendencies to the 2010 and 2011 assessments in terms of average trends. The results of the new assessment indicated that the ratio of Fcurrent/FMSY is estimated to be 0.42 (range: 0.21 to 0.80), indicating that overfishing is not occurring while the ratio of spawning biomass Bcurrent/BMSY is 1.44 (range: 0.87 to 2.2), indicating that the stock is not in an overfished state. Further the estimate of MSY is 132,000 tonnes and the 2012 catch was below this level. Reproduced from IOTC document IOTC-2013-SC16-R[E]. Resolution 13/10 established interim limit reference points for bigeye as 0.5BMSY and 1.3FMSY. These are not being exceeded.



Reproduced from IOTC document IOTC-2013-SC16-R[E].

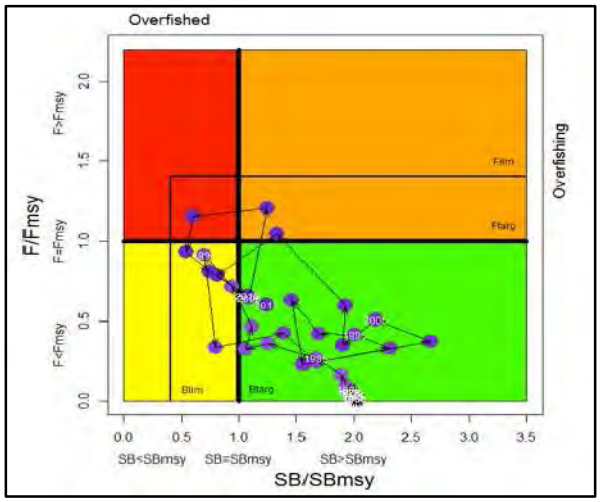
Figure 3.3.10 Yellowfin tuna: The 2012 assessment using two different models gave similar results to the 2011 assessment. The ratio of Fcurrent/FMSY is estimated at 0.61 or 0, 69 depending on the model, indicating that overfishing is not occurring. Also the stock is not in an overfished state as spawning biomass is above the BMSY level (Bcurrent/BMSY = 1.24 to 1.35, depending on the model). The value of MSY is estimated to be 320,000 to 344,000 tonnes depending on the model. This contrasts with the period 2003-2006, when catches substantially exceeded this level and the stock experienced a rapid decline. Since then, catches have decreased considerably and in 2011 the Scientific Committee estimated that the stock was in good health. Resolution 13/10 established interim limit reference points for yellowfin as 0.4BMSY and 1.4FMSY. These are not being exceeded. Reproduced from IOTC document IOTC-2013-SC16-R[E].



Reproduced from IOTC document IOTC-2013-SC16-R[E].

Figure 3.3.11 Skipjack: A stock assessment of skipjack was conducted for the first time in 2011 and updated in 2012. The results indicate that the ratio of Fcurrent/FMSY is estimated to be less than 0.80. Therefore, overfishing is not occurring. The stock is not in an overfished state as spawning biomass is above the BMSY level (Bcurrent/BMSY = 1.2). The median estimate of MSY is estimated to be 478,000 tonnes (range: 359,000 to 598,000 t).

Recommendation 13/10 established interim limit reference points for skipjack as 0.4BMSY and 1.5FMSY. These are not being exceeded.



Reproduced from IOTC document IOTC-2013-SC16-R[E].

3.3.4.3 AREA CLOSURES and QUOTA ALLOCATION SYSTEMS

In addition to the resolution(s) limiting fishing capacity discussed above, in 2014 IOTC introduced resolution 14/02. This recognizes that, based on past experience in the fishery, the potential production from the resource can be negatively impacted by excessive fishing effort. It also takes into account the available scientific information and advice, whereby the yellowfin tuna stock might have been over or fully exploited and the bigeye tuna stock may have been fully exploited in recent years. It recognizes that the IOTC Scientific Committee recommended that yellowfin tuna and bigeye tuna catches should not exceed the MSY levels which have been estimated at 300,000 tonnes for yellowfin tuna and at 110,000 tonnes for bigeye tuna and calls on members to implement a quota allocation system based on recommendations from the scientific committee.

It is very important to note that Resolution 14/02 supersedes IOTC Resolution 12/13. The latter explicitly linked the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24 m and vessels under 24m fishing outside of their own EEZ. The resolution also included specification for testing the effectiveness of the measure, regarded as a pilot. That testing was carried out in a timely fashion by independent analysts (IOTC-2011-SC14-40) who noted that:

"model results suggest that the extant network with only a two month IOTC closure has little impact on yellowfin tuna stocks either with the effort eliminated or redistributed.

and, that

"with a year-round closure of the IOTC area, the network could deliver conservation benefits improving the status of yellowfin tuna stocks under the assumption of total elimination of effort from the network area. Under the assumption that fishing effort was removed entirely, stock biomass increased, particularly in the larger age classes. However, in the scenario of a year round IOTC closure with effort reallocated evenly outside the area (for the purse seine fleet only) there was little impact on yellowfin stock status; with no change in biomass although a change in the age distribution of the population occurred due to the protection of juveniles in the IOTC area".

The IOTC-2011-SC14-40 report concluded that "It would therefore be precautionary to supplement closures with additional management measures, either to reduce fishing effort, ……. , or to apply catch controls such as the quota allocation system required in Resolution 10/01.

In relation to the first of these, it is evident that measures to reduce fishing effort have been sequentially introduced by IOTC for a considerable period, most recently by Resolution 12/11. In relation to the second, resolution 14/02 makes it compulsory for CPCs to establish an allocation system (Quota) or any other relevant measures based on the IOTC Scientific Committee recommendations for the main targeted species under the IOTC competence.

<u>Conclusion</u>

IOTC RES 12/13 explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ. The resolution also includes specification for testing the effectiveness of the measure, regarded as a pilot. That testing was carried out in a timely fashion by independent analysts (IOTC-2011-SC14-40) which found the limited, pilot measures insufficient to control exploitation but noted how extended measures could help to control exploitation, not so much by controlling catch volume but through improvements to the exploitation pattern (i.e. by reducing the selectivity of juvenile Yellowfin). Consideration of the spatial/temporal measures is also included in IOTC-2012-WPTT14-R[E]. It should be noted in this context that GCB 2.6.4 makes clear that control of exploitation rates need not be restricted to the use of HCR that respond directly to population size but might also, e.g., involve reducing exploitation rate on parts of the stock (as in the case of RES 12/13). Overall, the IOTC has demonstrated the ability via resolution to use spatial/temporal closures and intent to understand how these can be effective at controlling exploitation. This constitutes some evidence of use of an appropriate tool to control exploitation and to understand the efficacy of the tool.

The IOTC has a long history of resolutions aimed at limiting effort/capacity. These include IOTC RES01/04, 03/01, 06/05, 09/02, and 12/11. Early resolutions were aimed at non-members but were soon extended to all Contracting Parties and Cooperating non-members (CPC). The most recent resolution, IOTC RES12/11, is aimed at determining fishing capacity for all IOTC CPC, to ensure stabilisation of the level of fishing capacity active on stocks of high commercial value (including yellowfin tuna). The resolution provides for planned fleet development and vessel replacement but is aimed at ensuring no effective increase in capacity from a 2006 baseline plus any agreed Fishery Development Plans (FDP) for the years 2007-2013.

In addition, the IOTC has an ongoing process to develop a catch allocation scheme and has already developed allocation principles. IOTC RES 13/10 and the MSE research planning and contracting, and IOTC MSE workshop reports (C2_WK_MSE_REPORT), together with work on allocation (IOTC-2011-SS4-PropA[E], IOTC-2011-SS4-PropB[E], IOTC-2013-TCAC02-R[E]) clearly demonstrates the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction, though as of Nov 2013 these have not yet been used.

On the basis of the foregoing there is clearly some evidence that tools used to implement harvest control rules have been introduced by the IOTC, that they are appropriate and that they have been effective in controlling exploitation.

3.3.4.4 *Precautionary Management*

Paragraph 1 of IOTC resolution 13/10 specifies that when assessing stock status and providing recommendations to the Commission, the IOTC Scientific Committee should apply the interim target and limit reference points set out in table 1 to that resolution (below):

Table 3.3.12 Interim target and limit reference points

Table 1. Interim target and limit reference points.

Stock	Target Reference Point	Limit Reference Point
Albacore	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$
Bigeye tuna	B_{MSY}; F_{MSY}	$B_{LIM} = 0.50\ B_{MSY}$; $F_{LIM} = 1.30\ F_{MSY}$
Skipjack tuna	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.50\ F_{MSY}$
Yellowfin tuna	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$
Swordfish	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$

Source: IOTC Resolution 13/10

B_{MSY} refers to the biomass level for the stock that would produce Maximum Sustainable Yield while F_{MSY} refers to the level of fishing mortality that produces MSY.

It is noteworthy that the target is set at B_{MSY}. It can be argued that (i) this allows no precaution in management for errors in the estimation of the stock, and (ii) the estimation of MSY itself will have been subject to error and requires some precautionary element in management to address this. Given point (ii) <u>it is arguable that SG 80c might not be met in every case</u> (that is, because the individual and combined risks of the estimate of MSY are too high and stock status is potentially also being overestimated).

This problem of B_{MSY} F_{MSY} as targets or limits and the issues of uncertainty are not new. Other RFMOs (including ICCAT) also face the challenge of B_{MSY} as a target. Annex 2 of the UN Fish Stocks Agreement (UNFSA; UN, 1995) provides some guidance. It states that "*The fishing mortality rate which generates maximum sustainable yield should be regarded as a minimum standard for limit reference points. For stocks which are not overfished, fishery management strategies shall ensure that fishing mortality does not exceed that which corresponds to maximum sustainable yield, and that the biomass does not fall below a predefined threshold*." The World Summit for Sustainable Development (WSSD, Johannesburg; UN, 2002) states that "*To achieve sustainable fisheries, the following actions are required at all levels: (a) Maintain or restore stocks to levels that can produce the maximum sustainable yield with the aim of achieving these goals for depleted stocks on an urgent basis and where possible*

not later than 2015." The first statement refers to F_{MSY} as an upper limit to fishing mortality. From a starting point of excessive exploitation the latter statement can be considered as an intermediate step towards fulfilling the UNFSA requirements as it establishes an intermediate target for fishing mortality at FMSY, so that stocks are restored by 2015. Many competent authorities have based their implementation on the WSSD and the interpretation that fishing mortality should be reduced to F_{MSY} by 2015 where possible. In its implementation of this approach, for example, the International Council for the Exploration of the Sea, (ICES) defines both fishing mortality and biomass reference points (F_{MSY} and MSY $B_{trigger}$). However the approach does not currently use a B_{MSY} estimate. Rather it bases its approach on the view that B_{MSY} is a notional value around which stock size fluctuates when $F = F_{MSY}$. Indeed, recent stock size trends may not be informative about B_{MSY} (e.g., when F has exceeded F_{MSY} for many years or when current ecosystem conditions and spatial stock structure are, or could be, substantially different from those in the past). B_{MSY} strongly depends on the interactions between the fish stock and the environment it lives in, including biological interactions between different species.

Conversely if we consider MSY $B_{trigger}$ as the lower bound of fluctuation around B_{MSY} then it is a biomass reference point that triggers a cautious response. The cautious response is to reduce fishing mortality to allow a stock to rebuild and fluctuate around a notional value of B_{MSY} (even though the notional value is not specified in the framework). The concept of MSY $B_{trigger}$ evolves from the PA reference point Bpa that ICES has used as a basis for fisheries advice since the late 1990s. The evolution in the determination of MSY $B_{trigger}$ requires contemporary data with fishing at F_{MSY} to identify the normal range of fluctuations in biomass when stocks are fished at this fishing mortality rate.

From an IOTC perspective and given the uncertainties identified (i.e. errors in the estimation of the stock, and error in the estimation of MSY itself), incorporating a Btrigger as a specific value of spawning stock biomass (SSB) that ‘triggers’ a specific management action in the harvest control rule provides a means of specifically addressing uncertainty.

However IOTC has also made specific recommendations on uncertainty. These are contained in recommendation 14/07 “to standardise the presentation of scientific information in the annual scientific committee report and in working party reports”.

This specifies that

1. In support of the scientific advice made available by the IOTC Scientific Committee, the '*Executive Summaries*' within the annual IOTC Scientific Committee report which present stock assessment results, include when possible:

Stock status

a) A Kobe plot/chart showing:

I. Any Target and Limit Reference Points adopted by the Commission, e.g. FMSY and FLIM, SBMSY and SBLIM or BMSY and BLIM, depending on the assessment models used by the Scientific Committee, or proxies where available;

II. The stock estimates, expressed in reference to Target Reference Points adopted by the Commission, e.g. as FCURRENT on FMSY and as SBCURRENT on SBMSY or as BCURRENT on BMSY;

III. <u>The estimated uncertainty around estimates, provided that statistical methods to do so have been agreed upon the Scientific Committee and that sufficient data exist;</u>

IV. The stock status trajectory.

b) A graphical representation showing the proportion of model outputs of the years used for advice from the last stock assessment that are within the green quadrant of the Kobe plot/chart (not overfished, not subject to overfishing), the yellow and orange quadrants (overfished or subject to overfishing) and the red quadrant (overfished and subject to overfishing).

Model outlooks

c) Two Kobe II strategy matrices:

i. A first one indicating **<u>the probability of complying with the Target Reference Points</u>** adopted by the Commission, e.g. the probability of either SB>SBMSY or B>BMSY and of F<FMSY for different levels of catch across multiple years;

ii. A second one indicating the **probability of being inside safe biological limits** expressed through Limit Reference Points adopted by the Commission, e.g. the probability of either SB>SBLIM or B>BLIM and of F<FLIM for different levels of catch across multiple years;

iii. When the Commission agrees on acceptable probability levels associated with the target and limit reference points on a stock by stock basis, the Scientific Committee could prepare and include, in the annual report, the Kobe II strategy matrices using colour coding corresponding to these thresholds.

Data quality and limitations of the assessment models

d) A statement qualifying the **quality, the reliability and where relevant the representativeness of input data** to stock assessments, such as, but not limited to:

i. Fisheries statistics and fisheries indicators (e.g. catch and effort, catch-at size and catch at age matrices by sex and, when applicable, fisheries dependent indices of abundance);

ii. Biological information (e.g. growth parameters, natural mortality, maturity and fecundity, migration patterns and stock structure, fisheries independent indices of abundance);

iii. Complementary information (e.g. consistencies among available abundance indices, influence of the environmental factors on the dynamic of the stock, changes in fishing effort distribution, selectivity and fishing power, changes in target species).

e) **A statement qualifying the limits of the assessment model with respect to the type and the quality of the input data and expressing the possible biases in the assessment results associated with uncertainties of the input data**;

f) A **statement concerning the reliability of the projections carried out over the long term**.

Alternative approach (data poor stocks)

2. When, due to data or modelling limitations, the IOTC Scientific Committee is unable to develop Kobe II strategy matrices and associated charts or other estimates of current status relative to benchmarks, the IOTC Scientific Committee will develop its scientific advice on available fisheries-dependant and fisheries independent indicators and provide similar caveats as those detailed in paragraph 1(d).

Additional information and review of the structure and templates of the '*Executive Summaries*'

3. The Commission encourages the IOTC Scientific Committee to include either in its annual report or in the detailed reports, where possible and if considered as relevant and useful, any other tables and/or graphics supporting scientific advice and management recommendations. In particular, the IOTC Scientific Committee will include, where possible, information on the recruitment trajectories, on the stock-recruitment relationship and some ratio such as yield per recruit or biomass per recruit.

4. As far as needed, the IOTC Scientific Committee shall review recommendations and templates for the Kobe II strategy matrices, plot and graphical representations as laid down in this Recommendation and will advise the Commission on possible improvements.

3.4 Principle Two: Ecosystem Background

In the context of analysis of the impact of the fishery on the wider environment and the Indian ocean ecosystem, the current assessment report considers Pesqueras Echebastar's purse seine tuna fishery based on sets made on freeschool (unassociated) schools of skipjack, yellowfin and bigeye tuna. The Echebastar fisheries based on purse seine sets made on FADs or other floating objects are not included in the following discussion, therefore catches made by associated sets are not covered by the present report.

3.4.1 Retained species

In practical terms, there are few opportunities to sort catches during the fishing operation and most unwanted species captured incidentally are retained. Exceptions to this relate to several species that have been considered as ETP species (including manta rays, whale sharks, turtles) which largely by virtue of their size are either released from the gear while still in the water or – mostly in the case of turtles and some large sharks (but not whalesharks) - are taken out of brailers during the loading process and released back into the sea from the vessel.

Once catches have been brailed into hoppers located on the fishing deck they are then transported on conveyors beneath the deck to holding tanks containing superchilled hypersaline seawater. Catches enter the tanks and are not removed until they are discharged in port. Due to the rate at which catches are loaded there are no real opportunities to release fish. Fish is brailed from the open net directly into a hopper on the deck of the boat, from where it is transported to tanks containing superchilled hypersaline water suing a conveyor. There is no manual handling of catch and the rate of loading and speed of the conveyor means that it is not possible to remove and release the majority of unwanted catch. While some opportunity to remove larger unwanted specimens does exist when the bailer comes aboard and prior to discharge of contents into the hopper, the reality is that this slows down the loading operation significantly and therefore does not provide a realistic opportunity to sort catches. Even where some specimens can be removed, the probability is that other specimens of the same species will be retained and brought ashore. Because of this, in practical terms almost all species encountered in the gear are retained in the fishery. Accordingly, the assessment team has considered that there are no 'bycatch species' in the context of the definition of bycatch in the CR. Therefore, all unwanted species that are captured along with tuna in the freeschool fishery – save for a limited number of species that have been considered under the ETP component (2.3) – have been evaluated under the retained species component (2.1).

A number of sources of data have been available to the assessment team in relation to catches of non-target species in the freeschool sets fishery. Pesqueras Echebastar catch records for the period 2008-2012 have been made available for all vessels that are part of the assessment. Catch data provided does not include species other than tunas that may be taken and retained and such catches are not in the main recorded or reported.

Pesqueras Echebastar catch data records catches of tuna by type of set (freeschool, FAD, log etc.) for individual sets for all client group vessels. The data confirms that most freeschool sets are made on yellowfin tuna schools and significant volumes of both skipjack and bigeye tuna may be taken during such sets. Occasionally, sets are made on schools of skipjack and a review of catch data provided to the team suggests that freeschool sets targeting schools of skipjack tuna generally yield less by way of other retained tuna species. The assessment team has reviewed and analysed catch data for recent years and Table 3.4.1 presents catch data for three fishing years (2010,2011 and 2012) for freeschool sets ("banco libre") by vessel and species. Overall, freeschool catches comprise 64% yellowfin tuna, 24% skipjack, 12% bigeye and 1% albacore[1] based on the team's analysis.

Table 3.4.1 – Pesqueras Echebastar. Total catch of tuna species for freeschool sets by vessel for the fishing years 2010-2012

[1] Albacore are not included in the assessment

	1,000s/ kg				
Vessel	YFT	SKJ	BET	ALB	Total by species
Alakrana	6,306	2,159	967	46	9,478
Campolibre Alai	2,659	1,722	585	59	5,025
Demiku	2,710	1,191	828	16	4,746
Elai Alai	2,463	437	473	62	3,436
Erroxape	2,635	248	308	34	3,225
Xixili	2,555	1,379	379	0	4,312
Grand Total	**19,327**	**7,136**	**3,540**	**217**	**30,221**

Source: Echebastar group

Because of the likelihood that freeschool sets will generate varying and mixed catches of tuna because catches of any or all tuna species included in the assessment may be significant in terms of percentage of the total catch for any set, it is appropriate to consider yellowfin, skipjack and bigeye tuna all as main retained species, depending on the particular Unit of Certification being scored.

While it is possible that the specific mix of tuna (and size grade) leads to occasional discarding of the entire catch, all evidence available to the team is that this is a rare occurrence and overall volumes of tuna discarded in this manner are negligible. As discarding of target species is an issue for Principle 1, no further consideration to this matter is given under the Principle 2 retained species component.

In terms of non-tuna catch, a wide range of species may be captured and retained in the fishery. Limited data is collected in relation to unwanted species catch by Echebastar group directly. The assessment has therefore relied on published information to inform the assessment in relation to the catch of unwanted species in Indian Ocean tuna purse seine fisheries. Amongst these are Amande *et al* (2008), Garcia *et a*l (2013), Delgado de Molina *et al* 2005, Romanov (2002), Pianet (2006), Sarralde *et al* (2006), Ardill *et al* (2013) and Chavance *et al* (2011). Most of the published reports referred to analyse data collected from the observer programmes operating on EU purse seine tuna vessels in the Indian Ocean. Perhaps the most comprehensive and useful of these is Amande *et al* (2008) while Ardill *et al (*2013*)* is also very informative and provides an excellent review of the topic of bycatch in Indian Ocean tuna fisheries.

Amande *et al* (2008) analyses and reviews observer data in relation by bycatch for the EU purse seine fleet. The study analyses data that were collected under the EU data collection regulations in the period 2003 - 2007. The period coincides with a period when overall catches in the freeschool fishery was larger, before the use of drifting FADs became much more prevalent. However in this report, the free school purse seine set fishery included all non-drifting FAD purse seine sets, that is sets associated with semounts and marine mammals, therefore any conclusions regarding solely free school sets must be recognized as only a portion of the free school set fishery category identified in the report. Average bycatch rates estimated in the analysis suggest that the freeschool fishery has a very low impact on unwanted species of fish, billfish, sharks and rays.

A total of 1,958 fishing sets were observed. Estimation of total bycatch was carried out by sub sampling and uses raising factors based on major catches of commercial tunas to estimate bycatch, which is expressed in tons per 1000t of tuna landed. 93% of the fish bycatch was associated with the FAD fishery and overall bycatch of unwanted species groups (including non-commercial and small tuna) amounted to 1.5t of mixed fish species (comprising up to 55 species categories) per 1000t of landed tuna in the freeschool set fishery. Very few species or higher taxonomic groups were found to dominate the bycatch in terms of numbers or biomass. Seven categories of fish accounted for almost 99% of the total non-tuna finfish retained catch:

- Triggerfish (*Canthidermis maculatus, Aluterus monoceros, Abalistes stellatus, Balistidae*)
- Rainbow runner (*Elagatis bipinnulata*)
- Dolphinfishes (*Coryphaena hippurus, C. equiselis, Coryphaenidae*)
- Mackerel scad (*Decapterus macarellus*)

- Carangids (*Carangoides orthogrammus, Caranx sexfasciatus, Caranx crysos, Uraspis helvola, Uraspis uraspis, Uraspis secunda, Uraspis sp., Naucrates ductor, Decapterus sp., Seriola rivoliana, Carangidae*)
- Wahoo (*Acanthocybium solandri*)
- Barracuda (*Sphyraena barracuda, Sphyraenidae*)

Data in relation to bycatch (from sample data that has been raised for to reflect reported landings) are presented in Table 3.4.2.

Table 3.4.2 Total estimated bycatches for the EU Indian Ocean purse seine fisheries 2003-2008(in t)

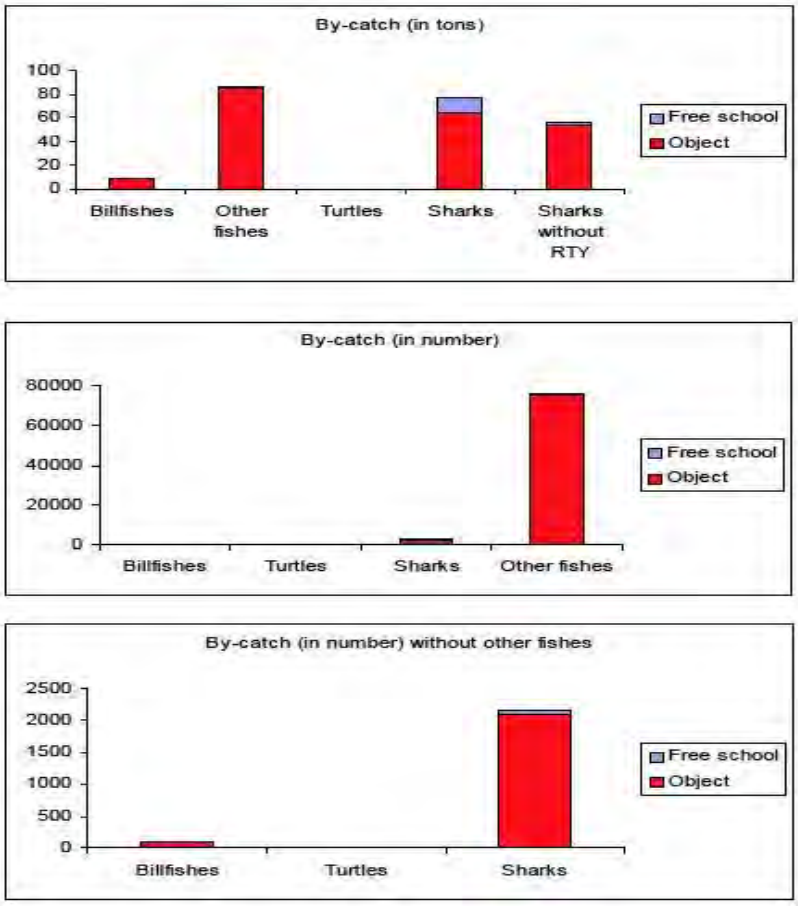
Species group	Fishing mode	2003	2004	2005	2006	2007	2008	2003-2008 average
Billfishes	FAD & Seamounts	148	112	134	171	105	111	130
	Free schools	63	68	62	46	32	38	51
	Total	211	180	196	217	136	149	182
Sharks	FAD & Seamounts	1 402	1 060	1 270	1 618	990	1 053	1 232
	Free schools	49	53	49	36	25	30	40
	Total	1 452	1 113	1 318	1 654	1 014	1 082	1 272
Rays	FAD & Seamounts	30	32	32	25	17	34	28
	Free schools	34	28	33	43	26	17	30
	Total	64	60	65	68	43	50	58
Finfishes	FAD & Seamounts	2 408	2 574	2 515	1 964	1 352	2 662	2 246
	Free schools	255	206	246	321	195	124	224
	Total	2 662	2 780	2 761	2 285	1 547	2 785	2 470
TOTAL	**FAD & Seamounts**	**3 989**	**3 779**	**3 951**	**3 778**	**2 463**	**3 859**	**3 636**
	Free schools	**401**	**355**	**390**	**446**	**277**	**208**	**346**
	Total	**4 389**	**4 134**	**4 340**	**4 225**	**2 740**	**4 067**	**3 983**

Source: IOTC-2009-WPEB-R[E] from an analysis by Amande et al (2008).

For the freeschool fishery, the analysis reveals that overall, some 300kg of sharks, 400kg of billfish and 200kg of rays were bycaught per 1000t landed tuna. Bycatch of billfish comprised six main species – black marlin, striped marlin, blue marlin, Indo-pacific sailfish, swordfish and shortbill spearfish. Of the total estimated billfish catch, approximately two thirds is made by the FAD fishery meaning that of the estimated 148 tonnes total billfish biomass captured, some 50t were captured by the free-school fishery over the period (approximately 10-12t per year, equivalent to approximately 400kg of billfish per 1000t landed tuna). The corresponding figure for ray bycatch is 0.2t/1000t landed tuna. The main species encountered were pelagic stingray, giant manta, Chilean devil ray, devil-fish and spine tail mobula. Shark bycatch for the period is estimated at 300kg per 1000t landed tuna. Oceanic white tip and silky shark accounted for 94% of landings by number and 90% by weight. Other species present included short-fin mako, blue shark, dusky shark and scalloped hammerhead shark.

Delgado de Molina *et al* (2005) and Sarralde *et al* (2006) also analyse bycatch rates in both freeschool and FAD sets using purse seine for the Spanish Indian Ocean fleet, based on data obtained over 336 fishing days and 11 fishing trips between 2003 and 2004. The study findings are consistent with those of Amande *et al* (2008) and also indicate that freeschool sets generally result in very low levels of bycatch, by both weight and numbers. Results in relation to recorded unwanted catches are presented in Figure 3.4.1 (from Delgado de Molina, 2005).

Figure 3.4.1 Catch of unwanted fauna in tonnes and number, for FADs and free school. Included above is a column for sharks— this excludes whale-shark.



From: Delgado de Molina et al, 2006

As previously described, a wide range of species are captured incidentally in the freeschool set fishery. Many of the species captured are of unknown or uncertain stock status. That said, available evidence suggests that much of the unwanted bycatch comprises relatively abundant fast growing species, including small specimens of target tuna (bigeye, yellowfin and skipjack) as well as unwanted tuna species such as kawakawa, frigate tuna and little tunny. Overall risks are considered to be low for these species due to the low level of encounter as well as the reproductive and growth characteristics of populations or species groups. However, some other species and species groups that may be captured are likely to be more vulnerable to population level impacts as a result of fishery related removals.

Typically this includes sharks and rays as well as some billfish species. Many of the species that could potentially suffer negative impacts are also are subjected to directed fisheries elsewhere. Individual population status is often unknown and most Indian Ocean stocks are not the focus of analytical assessments. Accordingly,very little maybe known about their true status in the Indian Ocean. IOTC classifies many species of shark and billfish in the Indian Ocean as data deficient and of uncertain status.

Tuna retained species catch

Amande et al (2008) estimates that 54% of the bycatch is comprised of tuna or tuna like species. Discards of unwanted or damaged species/specimens runs to an estimated 19.2t/1,000t landed tuna. Tuna discards and bycatch are higher on FAD sets than on freeschool sets. The predominant species of unwanted tuna skipjack and bigeye and yellowfin that are less than 40-45cm fork length (corresponding to c. 1.5kg in weight), while species of smaller tuna including predominantly frigate or bullet tuna *Aauxus thazard* and *Auxis rochei* as well as little tunny *Euthynuus* sp.

Fish

Studies have shown that overall levels of bycatch are low and most of this is comprised of a limited number of teleost fish, with none of these being considered particularly vulnerable to fishing related impacts. All are relatively abundant in the region and are highly fecund, fast growing and/or short lived. This makes them unlikely to be sensitive to bycatch and to suffer impacts at population level. The average capture rate of these species indicated by (Amande *et al* (2008) is 1.5t/1000t of landed tuna and is exceptionally low, being equivalent to 0.15% by weight. On this basis, significant fishery related impacts by the freeschool set purse seine fishery are considered highly improbable.

Sharks

A number of shark species have been found to occur in the catches which were subject to observer sampling in most of the previously referred to studies. Amongst these are oceanic white tip shark *Carcharhinus longimanus*, silky shark *Carcharhinus falciformis*, dusky shark *Carcharhinus obscurus*, short fin mako *Isurus oxyrinchus* and blue shark *Prionace glauca*.

Both oceanic whitetip and silky shark are considered to be vulnerable on account of life history characteristics. While there is evidence that many larger shark specimens are either released from the net or from the deck of the boat (Poisson *et al* 2011), smaller specimens are likely to be retained. It is estimated from tagging that of 20 sharks released alive after having been captured in tuna purse seines in the Indian Ocean, 9 appeared to survive.

Billfishes

A number of billfish species are also recorded in Indian Ocean tuna purse seine fisheries. Species that may be captured include black marlin *Istiompax indica*, striped marlin *Kajikia audax*, Indo-Pacific sailfish *Istiophorus platypterus*, swordfish *Xiphias gladius* and shortbill spearfish *Tetrapturus angustirostris.* However apart from catches of Indo-pacific sailfish, the majority of the incidental capture is associated with the FAD based fishery (Amande *et al.,* 2008). The majority of billfish are either discarded dead (65%) or retained for consumption (20%). A small number estimated to be 7% are released alive. No estimate is available to indicate survival of released specimens.

Rays

A number of ray species are also captured incidentally. Mobula, Chilean devil ray and pelagic stingray are all considered to be vulnerable on account of life history characteristics. The main specie encountered were *Dasyatis violacea (*pelagic stingray*), Manta birostris (*giant manta*), Mobula coilloti* (Chilean devil ray*), Mobula mobular (*devil fish) and *Mobula rancurelli (*spine tail mobula). While there is evidence that many larger specimens of these are either released from the net or from the deck of the boat smaller specimens of most captured species other than giant manta, are highly likely to be retained. According to Amande *et al* (2008) rays are caught on both log and freeschool sets and no clear dominance is evident for either gear type.

Apart from the tuna species, little information is available in relation to the status of most if not all of the populations referred to by Amande *et al* (2008) and they are considered data deficient therefore in the context of the MSC assessment.

Murua *et al* (2009) conducted an ecological risk assessment (ERA) for species caught in fisheries managed by the Indian Ocean Tuna Commission (IOTC). In general, the analysis identified two main risk groups. The first was represented by pelagic and coastal sharks, which are often defined by low productivities. A second group includes teleosts (both IOTC and non-IOTC species) characterized by higher productivities but also high susceptibility to purse seine gear. While useful for identifying which species or species groups are theoretically most at risk, the study does not take into account the actual number captured and is therefore of limited direct significance in estimating outcome status for the fishery under assessment for data deficient scoring elements under 2.1. No other studies have been available to the assessment team that have allowed for the evaluation of risks to data deficient species from the freeschool fishery. Accordingly, in order to qualitatively assess the impact of the fishery on retained species stocks, the MSC risk based framework (RBF) was used in order to carry out an evaluation of the risk that the freeschool fishery presents to the overall mix of species captured and retained along with target catches of yellowfin, skipjack and bigeye tuna.

The CR (v1.3) considers 'main' retained species to be those species that comprise 5% or more of the total catch, or, where less than 5% maybe vulnerable to fishery related impacts through retention as bycatch. It has not been possible to evaluate the impact of the freeschool fishery on all retained species, given that status of many species that maybe retained is unknown or uncertain. However given that for 2.1 outcome status, the requirement for SG80 is to consider the effect of the fishery only on 'main' retained species, for the purposes of the present assessment, retained catch that has been considered in the retained catch performance indicator (2.1) for individual UoC's includes two of the three target tuna species (skipjack, bigeye and yellowfin) that are not the focus of the particular UoC, as well as catches of vulnerable species. Impacts of the fishery on other species (most teleost fish and small target tunas and unwanted tunas) are considered negligible for reasons described above and are not considered further.

The principal retained catch is of other large tunas. Target tuna stocks are subject to assessment in the Indian Ocean and there is good information in relation to stock status for bigeye, yellowfin and skipjack tuna. Stock status of these tunas have been assessed at Principle 1 level and have scored above 80, therefore they automatically achieve SG80 for P2 as retained species. The most recent stock-assessments conducted by IOTC concluded that:

- Albacore (exploited mainly by the longline fishery) – it is considered likely that recent catches have been above MSY, recent fishing mortality exceeds FMSY (F2010/FMSY > 1). There is a moderate risk that total biomass is below BMSY (B2010/BMSY ≈ 1);
- Bigeye (exploited by all fisheries but only by longlines as target species): Both assessments suggest that the stock is above a biomass level that would produce MSY in the long term and that current fishing mortality is below the MSY based reference level (i.e. SBcurrent/SBMSY >1 and Fcurrent/FMSY < 1);
- Yellowfin (exploited by all fisheries): The stock assessment model used in 2011 suggests that the stock is currently not overfished (B2009>BMSY) and overfishing is not occurring (F2009<FMSY);
- Skipjack (exploited by pole-and-line and purse seine): The weighted results suggest that the stock is not overfished (B>BMSY) and that overfishing is not occurring (C<MSY, used as a proxy for F<FMSY);

Previous assessments had indicated that yellowfin tuna stocks were heavily exploited, possibly as an indirect result of piracy in the Western Indian Ocean. This affected both purse seine and longline targeting and the resulting catches, The stock has since recovered. The impact of the fishery in assessment on other (non-tuna) 'main' retained P2 species cannot be determined quantitatively based on existing information. According to Table AC2 of the CR (v1.3) therefore, in order to evaluate the impact of the fishery on data deficient species, the MSC risk based framework has been used. During this process, a qualitative evaluation of the risks of the freeschool fishery to tuna, finfish, shark, ray and billfish species was conducted using a Scale Intensity Consequence Analysis (SICA). The SICA process identified the following list of data deficient species scoring elements for 2.1:

STOCK STATUS

Neritic tunas –

- frigate/bullet tuna
- little tunny *Euthynnus* sp.

According to Ardill *et al* (2013), the estimated bycatch of neritic tunas in the Indian Ocean by oceanic purse seiners is of 5,200 t. This is a small proportion of the 129,000 t of kawakawa caught in 2010 from mainly coastal fisheries (IOTC-NC), Frigate and bullet tunas had landings of 38,000 t in 2009. Over the last five years, the Maldives catch of kawakawa has averaged nearly 4,000 t, while that of frigate tuna averaged 2,500 t. At these levels of catches, it is considered unlikely that the surface fishery bycatch could influence the stock status of neritic tunas.

Teleost fish -

- Rainbow runner (*Elagatis bipinnulata*)

- Dolphinfishes (*Coryphaena hippurus, C. equiselis, Coryphaenidae*)
- Mackerel scad (*Decapterus macarellus*)
- Carangids (*Carangoides orthogrammus, Caranx sexfasciatus, Caranx crysos, Uraspis helvola, Uraspis uraspis, Uraspis secunda, Uraspis sp., Naucrates ductor, Decapterus sp., Seriola rivoliana, Carangidae*)
- Wahoo (*Acanthocybium solandri*)
- Barracuda (*Sphyraena barracuda, Sphyraenidae*)
- Triggerfish (*Canthidermis maculatus, Aluterus monoceros, Abalistes stellatus, Balistidae*)

According to Ardill et al (2013), Of the 50 or more species of other finfish in the purse seine bycatch, the only significant quantities are of rainbow runner (1,200 t), oceanic triggerfish (776 t) and dolphinfish (356 t). All these species are pan-oceanic, short-lived and have high reproductive capacity, such that the relatively small amounts caught by seiners are very unlikely to impact on the stocks.

Sharks-

- oceanic white-tip
- silky shark
- short-fin mako
- blue shark

According to Ardill *et al* (2013):

- There is no quantitative stock assessment or basic fishery indicators currently available for silky sharks in the Indian Ocean, therefore the stock status is highly uncertain.
- There is no quantitative stock assessment and limited basic fishery indicators currently available for oceanic whitetip in the Indian Ocean therefore the stock status is also highly uncertain. Because of their life history characteristics – they are relatively long lived, mature at 4–5 years, and have relativity few offspring (<20 pups every two years), the oceanic whitetip shark is vulnerable to overfishing. Despite the lack of data, it is apparent from the information that is available that oceanic whitetip shark abundance has declined significantly over recent decades.
- There is no quantitative stock assessment for blue shark in the Indian Ocean, therefore the stock status is highly uncertain. Blue sharks are commonly taken by a range of fisheries in the Indian Ocean and in some areas they are fished in their nursery grounds. Because of their life history characteristics – they are relatively long lived (16–20 years), mature relatively late (at 4–6 years), and have relativity few offspring (25–50 pups every year), the blue shark is vulnerable to overfishing. However, standardised CPUEs from Japanese (Hiraoka et.al. 2012) and from Portuguese (Coelhoet al. 2012) longliners actually show an increasing trend, indicative of stable stock status. Blue shark assessments in the Atlantic and Pacific oceans seem to indicate that blue shark stocks can sustain relatively high fishing pressure.
- For shortfin mako shark, Data are not available at the IOTC for stock assessment, but historical research data shows overall decline in CPUE and mean weight of mako sharks

Rays –

- Chilean devil ray

- mobula
- pelagic sting ray
- devilfish
- spine tail mobula

Insufficient data are available to carry out an assessment of stock status for most species in the Indian Ocean. However, according to Ardill *et al* (2013) most specimens (if not all) are returned to the sea on capture and some survival is likely. Overall impacts of the freeschool set fishery are considered to be minimal.

Billfish –

- black marlin
- striped marlin
- indo-pacific sailfish
- short bill spearfish

Total Indian Ocean billfish catches in 2010 were reported at 44,000 t, 50% of which were sailfish. The purse seine bycatch of 149 t is negligible in comparison to that of other gears and is considered too small to warrant further evaluation of impacts (Ardill *et al.,* 2013).

Whale shark, giant manta, turtles and marine mammals are considered under the ETP performance indicator (2.3) and their consideration under 2.1 or SICA is therefore not appropriate.

During the SICA evaluation, silky shark and oceanic white-tip shark were been identified as the most vulnerable data deficient species retained in the freeschool fishery. The most plausible worst-case scenario for impacts of the fishery on these species was deemed to be potential impacts on reproductive capacity of the populations as a result of retention in tuna purse seine fisheries. Results from the SICA analysis indicate a converted MSC equivalent score of 80 for both silky shark and oceanic white-tip shark scoring elements. According to CR CC2.3.6.6, the score for data deficient scoring elements has been combined with the score for non-data deficient scoring elements (target tuna species) to determine the overall score using Table C2.

More information on the SICA process and results of stakeholder participation in this SICA process for this fishery are presented in section 4 of the report main body as well as in Appendix 1.3.

Retained species management

Levels of retained catch in the freeschool fishery are known to be low and overall impacts are not considered to present a significant threat to affected populations. Nevertheless, a range of measures are in place in order to manage impacts of the fishery on non-target species, including retained species (effectively there are no ‘bycatch’ species as per MSC definition) and ETP species.

Amongst the most significant operational measures that assist in minimising levels of unwanted catch is the utilisation of purse seine gears to target freeschool tunas. Freeschool sets feature characteristically very low levels of retained species bycatch and bycatch levels from freeschool sets are a small fraction (c. 10-20%) of that associated with FAD sets. In freeschool sets, catches of small target or non-target tuna species are avoided and efforts are made by fishing crews to identify the type of school prior to setting of the gear. Freeschool sets have a high incidence of failure in terms of making catches and crews may use a number of indicators such as depth of school, acoustic signatures and school movement data in order to assist in identifying likely target schools and avoid unwanted catches, while also improving the probability of making a successful set. Catches of undersize tunas or schools with an undesirable species and/or size mix are infrequent overall. However where they do occur, as is typically detected at the commencement of the loading process, there are still opportunities for the release of catches from purse seines, with the possibility that a significant proportion for the encircled school will survive post-release.

At IOTC level, there are a variety of resolutions in place which are expected to help ensure stocks of all tunas remain at levels that are highly likely to be within biologically based limits. Resolutions in place relate to:

- Adoption of an interim harvest strategy including interim target and limit reference points for target tuna stocks
- Stock assessment relative to reference points for main tuna species
- Overall tuna fleet effort limitation (through restriction on entry/limitation of fishing capacity)
- Implementation of additional species/species group conservation and management measures
- Adoption of the precautionary approach in IOTC management of tunas
- Resolution 13/11 on a ban on discards of bigeye, skipjack and yellowfin tuna and a recommendation for non-target species caught in the IOTC area by purse seine vessels;
- MSE evaluation for IOTC tuna stocks. MSE is eventually expected to lead to the adoption of a clear harvest strategy and harvest control rules for IOTC stocks.

In terms of managing impacts on non-tuna retained catches, a number of regulations exist and apply to the fishery. Council Regulation (EC) No 520/2007 lays down technical measures for the conservation of certain stocks of highly migratory species. Under Article 19 Member States are required to do their utmost to encourage the release of live sharks caught accidentally, in particular juveniles. Member States shall also encourage the reduction of discards of sharks. IOTC Resolution 13/06 entered into force in November 2013. The resolution requires IOTC members to prohibit, as an interim pilot measure, all fishing vessels flying their flag and on the IOTC Record of Authorised Vessels, or authorised to fish for tuna or tuna-like species managed by the IOTC on the high seas to retain onboard, tranship, land or store any part or whole carcass of oceanic whitetip sharks. Furthermore, IOTC member vessels fishing on the high seas are required to promptly release unharmed, to the extent practicable, oceanic white tip sharks. Contracting party vessels are also required to encourage their fishers to record incidental catches as well as live releases of oceanic white tip shark. Contracting parties are also encouraged to undertake research into oceanic white tip sharks in the IOTC area and are further encouraged to engage in scientific data collection using observers.

There is some evidence that released sharks survive. Poisson *et al* (2011) estimated the survival rate of silky sharks caught incidentally onboard French tropical purse seiners in the Indian Ocean. Through participation in two commercial fishing trips, we first recorded the number of sharks (primarily silky sharks that were alive or dead, once they had been sorted by the crew on the upper and lower decks. More sharks were observed in the lower deck (73%) than in the upper deck. The silky sharks observed on the upper deck were significantly larger than the ones found in the lower deck. The immediate mortality (sharks that were already dead at the time of first observation) rates appeared to be a function of the location of the specimen on the boat, as more dead sharks were recorded on the lower deck than the upper deck. Overall, 20 silky sharks (125.3 ± 33.8 cm total length) were tagged with data storage satellite tags in order to study their survival after release. Six tags clearly showed mortality shortly after release, while data from three other tags indicated likely delayed mortality after 2.5, 14 and 15 days. Nine tags showed that the sharks most likely survived. A further two tags failed to report data and one was incorrectly initiated and did not yield any data either. The study is relevant in that significant mortality of sharks is demonstrated, even when they are released alive from the boat deck having been captured in purse seine gear. The study also revealed the diminished chances of release, and therefore of survival, of a specimen once it leaves the working (fishing) deck and enters onto the conveyor on the lower deck. Following on from this research, Poisson *et al* (2012) developed a code of good of good practice for the handling of retained shark with the aim of increasing the chances of survival of released specimens.

Other management measures in place that are relevant in the bycatch management context include a requirement for the recording of catch and effort data by fishing vessels in the IOTC area (Resolution 13/03); Resolution 13/11 on a ban on discards of bigeye, skipjack and yellowfin tuna and a recommendation for non-target species caught in the IOTC area by purse seine vessels; Resolution 12/12 On the implementation of a limitation on of fishing capacity; Resolution 12/12 to promote the implementation of conservation and management measures already adopted by IOTC and Resolution 10/11 on port state measures to prevent, deter and eliminate IUU fishing.

EU and national (Spain and Seychelles) management that is relevant in the context of managing impacts on bycatch species includes vessel licensing and permitting, catch (and bycatch) reporting, landing restrictions, requirements for observer coverage, bans on shark finning, International Plans of Action for harks (IPOA), requirement for vessels to carry VMS as well as a number of spatial and temporal restrictions. Collectively, these measures assist in managing the impact of the fishery on unwanted species.

In terms of observer programmes, a number of scheme/data collection initiatives are in operation.

Under current IOTC requirements, a minimum of 5% of effort must be covered for all fleets operating in the Indian Ocean (IOTC Regional Observer Scheme). The DCF is also in operation in relation to EU flagged vessels and EU observers collect data, according to the requirements of the European Union, as set out in the data collection framework http://datacollection.jrc.ec.europa.eu/ onboard these vessels in addition to the IOTC requirement. Finally, Pesqueras Echebaster have voluntarily taken the decision to implement 100% observer coverage on all its vessels from January 2014.

In order to meet with IOTC regional Observer Scheme requirements as well as the voluntary 100% cover initiative, the company have signed a Memorandum of Understanding with the Seychelles Fishing Authority to supply observers from January 2014. The memorandum for observer programmes covers implementation of the Seychelles National Scientific Observers Programme in compliance with the IOTC Regional Observer Scheme onboard Seychellois registered vessels; observer coverage for Seychelles flagged vessels over and above the 5% cover mandated by IOTC as well as additional 100% coverage for vessels flying the Spanish flag. Echebaster have agreed to fund the additional observer coverage required to meet with 100% cover on Seychelles registered vessels, while the SFA will fund the IOTC required 5% cover on Seychelles registered vessels. Echebaster fully fund the cost of meeting with IOTC 5% cover as well as additional cover to meet with 100% on Spanish flagged vessels. The 100% cover observer programme is permanent. Echebaster vessels are listed on the Pro-Active Vessel register of the International Seafood Sustainability Foundation (ISSF) and 100% observer coverage is strongly recommended in this context by ISSF. In addition to this, 100% cover is obligatory requirement of membership of the Spanish fishing associations of ANABAC and OPGAC

Information provided to the assessment during the Notice of Intent to review period indicated that the 100% cover voluntaryr scheme is operating as intended and no vessels go to sea now without a Seychelles Fishing Authority observer being onboard. The targets for IOTC and Echebaster (5% and 100% of effort) are being achieved during 2014.

In addition to the above, the EU Data Collection Framework has been running continuously since 2003. The EU program requires 10% of effort target coverage on community-registered vessels. In order to meet with the requirements for observer coverage under the DCF AZTI Tecnalia in general provide observers to meet with the requirement.

In all cases, observers primarily record catch and bycatch data as well as basic fishery information such as that as specified by the DCF and /or IOTC protocol.

In addition to the above, Echebastar group are active in carrying out research and investigations in an attempt to further reduce or eliminate as much unwanted catch from tuna sets as is possible and a number of investigations have been carried out in this regard in recent years. Research into bycatch levels in the purse seine fishery was carried out by Echebastar in collaboration with Grupo de Investigacion en Biodiversidad y Conservacion, Universidad de Las Palmas de Gran Canaria during 2013. A technical report (Garcia et al, 2013) has been provided to the team. The report is based on observer data for bycatch in 168 hauls (7 of which were based on freeschool sets) carried out during February/March 2013. Some useful data are generated in relation to freeschool set bycatch. A further objective of the study was also to train crew in the use of good practices to reduce the mortality of sharks and other animals captured incidentally by purse seiners, according to the guidelines contained in Poisson *et al (*2012). A further study in which Echebastar group is a partner (Anon, 2013) investigates possible bycatch mitigation measures in the tropical tuna purse seine fishery. Further research is planned and during October 2013 Echebastar group were confirmed to be in in receipt of significant research funding assistance in order to develop a prototype selectivity device for use in purse seine tuna fisheries. The assessment team were informed that the study will aim to monitor the behaviour of fish in purse seine nets in order to better understand reactions to capture and to assist in developing effective escape panels.

Overall, it is apparent that the level of bycatch on the fishery is very low, and that the impact on the most vulnerable species is likely to be negligible. Some evidence was available that indicated Echebastar may operate board procedures that are intended to ensure unwanted catch of retained tuna and other species is minimised and that large captured specimens such as sharks, mantas and turtles are removed from the purse seine or brailer at the earliest opportunity. Despite all of the above, the team did identify a number of weaknesses in the management of retained bycatch in this fishery. While overall these weaknesses did not cause the fishery to score below 80 in either outcome or management performance indicators for the retained species component, the assessment team was of the opinion that management of bycatch could justifiably be further reinforced in the context of the partial strategy and measures that are already in place. In this regard a recommendation has been made that suggests greater levels of training among fishing crews should be undertaken. Training should extend beyond fishing skippers to include all deck and fishing crews. It should be undertaken at regular intervals, training records should be kept. That bycatch management training has been undertaken by all relevant crew should also be verifiable. Furthermore, the team found that clear, detailed written strategies for bycatch management at operational level were lacking. Clear documented strategies that include:

- detailed onboard procedures and techniques for minimizing overall levels of bycatch
- detailed procedures for ensuring the careful handling and prompt release (using appropriate techniques) of captured specimens of shark and ray and
- details of key functions and responsible personnel in relation to implementation of the overall strategy and individual measures need to be developed and should be available for reference onboard in all the working languages of the crews.

All of the above have been captured in a recommendation issued as part of the certification process.

In terms of the information that is available and which is generated either through research or through ongoing collection of data in relation to the operation of the fishery the assessment found that there is good information in relation to a number of areas relevant in the context of management of risks to retained target catches as well as unwanted and incidental catches in the fishery. Recording and reporting of catches of target tuna is undertaken with a high degree of accuracy and data are verified through supervision of landings and in port inspection and sampling of catches by SFA personnel.

Significant amounts of research is undertaken through IOTC e.g. through the WPEB and WPTT, as well as by the EU and Seychelles, which serves to inform management of bycatch in relation to trends and overall levels of impact. Much of the research findings are reported and are available through IOTC. In addition to this, Pesqueras Echebastar are now fully involved in an observer programme in order to meet with IOTC targets of 5% coverage of fishing effort for the purse seine tuna fleet. The observer programme commenced in August 2013 and is expected to yield significant data in relation to bycatch and other aspects of the fishery. The fleets (both Seychellois and Spanish/EU) all are required to carry VMS systems that allow the real time tracking of vessels at all times in the Indian Ocean. Through VMS and cross referencing with reported landings and catches, good estimates of fishing effort can be made and spatial and temporal aspects of the fishery can be monitored on an ongoing basis.

However, a number of shortcomings in data collection and information to support management of impacts on retained non target bycatch were noted. These mainly relate to the lack of complete recording and reporting of bycatch. In this context, the assessment team believe that there is greater scope for recording and reporting of bycatch during the fishing operation, especially in relation to capture and fate of vulnerable species. The assessment team also found that there is incomplete recording and little reporting of total volumes of bycatch upon unloading of the vessel. The assessment team also recognise that the recording of bycatch as catches are loaded is very difficult if not impossible without adequate resources, due to the volumes of total catches as well as the rate at which the catch is loaded. While a SFA observer may be carried (and noting that there are future plans for voluntary 100% observer coverage by the Pesqueras Echebastar), there are significant doubts about the ability of a single onboard observer to effectively monitor and record retained bycatch as it comes aboard. There is a strong case for the role of observer to be split amongst two or more onboard observers due to the fact that a single observer cannot possibly monitor bycatch on the fishing deck (where large specimens may be removed from the brailer) and on the lower deck simultaneously as catches are taken aboard. Incomplete recording of the catch and fate of all retained species (during loading and/or at discharge of catch) together with the above weaknesses in the observer programme is reflected in the scoring of performance indicator 2.1.3 (Retained species information), where a score of 75 has resulted in the raising of a condition of certification.

3.4.2 Bycatch species

Section 3.4.1 describes the full range of species that may be taken as bycatch in the fishery. Purse seine sets on freeschools of tuna are very unlikely to yield large or significant volumes by way of unwanted catch of any species. It is known that skipjack tuna are relatively difficult to capture by freeschool sets and purse seine sets on schools of skipjack associated with FADs are most likely to yield the highest levels of bycatch in the purse seine fishery. While FAD associated sets on yellowfin and bigeye schools may also yield much higher levels of bycatch for a range of species. Reviews and analysis of sampling data for the EU Indian Ocean purse seine fleet e.g. Chavance *et al* (2008) confirm this.

As previously explained, the assessment has found that apart from those species considered under the ETP component of the assessment, specimens of practically every species encountered in purse seine sets in the freeschool fishery are retained. Reasons for this are that there are no effective opportunities for sorting of catches to the extent that all specimens of a retained species are removed. While large and/or prominent individual organisms (e.g. large sharks and rays) are likely to be removed from the catch on the fishing deck, the reality is that this is a bulk fishery and no further sorting of catch is possible Under the CR definition of bycatch ("organisms that have been taken incidentally and are not retained") there are no species that the team have found meet with the criteria of 'bycatch' and which are not considered as ETP species. All species encountered in the fishery have therefore been considered under either the retained catch component (2.1) or the ETP component (2.3). Purse seine fishing on freeschool tunas is highly unlikely to give rise to significant unrecorded mortality (i.e. mortality of species NOT landed) of any species and general information supports the understanding that there is no significant bycatch mortality of seabirds in high seas tuna freeschool sets and that associated impacts are therefore negligible.

Despite the determination that there are no bycatch species in the context of this assessment, there is a range of measures that are considered to represent a partial strategy to manage impacts on bycatch generally. Measures have already described more fully in section 3.4.1 and are detailed again in the scoring justification table for 2.2.2. Bycatch management includes those measures described under 3.4.1 in respect of management of retained species, as they are considered equally relevant to this component even though the assessment has determined there are no bycatch species.

Present information gathering is not considered likely to capture incidents of bycatch where by a whole catch maybe discarded (often referred to as slippage). However, the species concerned and likely to give rise to such an event are likely to be either catches of small (<1.5kg) yellowfin, skipjack or bigeye tuna, or high levels of unwanted tunas (kawakawa, frigate or bullet tuna or little tunny) in the catch. These species are all considered either as P1 target stocks and/or P2 retained species. The uncertainty over levels of discarding of these species has been captured under 3.4.1 and is reflected in the scoring of the information Performance Indicator for 2.1.

It is not therefore appropriate to re-consider these species or the uncertainty described again here or in the scoring of 2.2 as this would lead to double scoring of the same issue.

3.4.3 Endangered, threatened and protected species

Both Spain and the Seychelles are signatories of the Convention on International Trade in Endangered species of wild flora and fauna (CITES). Accordingly, the CITES regulations apply to the registered fishing fleet of both nations. Other than CITES rules there are very limited EU, Spanish or Seychellois regulations with respect to ETP species that the fishery potentially interacts with.

The assessment has had a reasonable amount of data made available to it in relation to general levels of interaction between Indian Ocean purse seine fisheries and ETP species. A range of species may be impacted by the fishery, including turtles, sharks, rays and cetaceans. Amande *et al* (2008) reports that EU observers recorded interactions with 4 turtle species – green turtle *Chelonia mydas* (IUCN endangered), loggerhead turtle *Caretta caretta* (IUCN endangered), Olive ridley *Lepidochelys olivacea* (IUCN vulnerable) and hawksbill *Eretmochelys imbricata* (IUCN critically endangered) during onboard monitoring of Indian ocean tuna purse seine catches. Of these, only olive ridley and hawksbill turtles were record in association with free school sets. Of the range of international conservation agreements directly or potentially applying to sea turtles, only the Convention on International Trade in Endangered

Species of Wild Fauna and Flora (CITES) makes specific provisions to protect sea turtles from international trade. CITES has effectively curbed international trade in sea turtles primarily by prohibiting commercial international trade in all species of sea turtles and their body parts.

As reported by Amande *et al* (2008) observations in relation to turtles were occasional and almost exclusively made on sets made on or associated with FADs or natural floating objects (referred to as 'log sets') and 95% of turtle encounters came from this technique of purse seining. Of those turtles captured during FAD or log associated sets, 90% of turtles were recorded as being released alive by the study. Over the period (2003-2007) less than 300 turtles are estimated to have been killed in EU tuna purse seine fisheries in the Indian Ocean. Clermont *et al* (2012) analysed interactions between the EU purse seine fleet and marine turtles in the Atlantic and Indian Oceans over a 15-year period. The data show that 597 turtles were caught in 9,398 sets on free schools and 6,515 sets related to FADs (15,913 total sets). 86% of all turtles were released alive into the sea. The study concludes that the observed impact of the EU tropical purse seine fishery is extremely low in comparison to other worldwide estimates of turtle mortality in industrial and artisanal fishing gears – such as pelagic long-lines, gillnets, and trawl nets – which are associated with estimated mortality rates that are several orders of magnitude higher.

There is also Momorandum of Uunderstanding on the Conservation of Maine Turltes and their Habitats of the Indian Ocean and Southeast Asia (IOSEA). IOSEA is an intergovernmental agency that aims to "protect, conserve, replenish and recover marine turtles and their habitats in the Indian Ocean abd Southeast Asia. The Seychelles is a signatory to IOSEA. IOSEA has a program that tags the flippers of sea turtles that it has released, and it requests that information on those turtles be forwarded to IOSEA at http://flippertag.loseaturtles.org/.

Overall, both direct mortality and possible indirect impacts (such as competition for forage, habitat destruction, disturbance etc.) of the freeschool fishery on turtle populations has been assessed as being negligible on the basis of available information, some of which has emanated from the Spanish Indian Ocean purse seine fishery.

In addition to turtles, the data shows that two species of cetaceans were recorded during purse seine fishing for tuna in the Indian Ocean – fin whale *Balaenoptera physalus* (IUCN endangered) and false killer whale *Pseudorca crassidens* (IUCN data deficient). Only fin whales were recorded during so-called free-school sets, but in reality these set were most likely made because of the presence of a whale. Whale -associated sets) are excluded from the assessment. Fin Whales are listed on Appendix I of the Convention on Trade in Endangered Species (CITES). Fin whales are also listed on Appendices I and II of the Convention on Migratory Species (CMS). Association of tuna fisheries with whales in the Indian Ocean is well documented and Echebaster vessels can and do make sets in association with baleen whales. It is likely that such sets do occasionally result in mortality to whales, either directly at time of capture or at some time afterwards on account of injuries or trauma sustained during attempts made at escaping from the gears. Romanov (2002) noted that among 45 sets made on whale associated tuna schools recorded in logbooks of purse seiners in the Indian Ocean, 13 were made on schools of tuna associated with sei whales (*Balaenoptera borealis*) while one was made on a fin whale associated school. Remaining sets were made on unidentified species. Reference is also made to the fact that there are verbal reports that tuna schools in the western Indian Ocean are also associated with Bride's whale (Balaenoptera *edeni*), minke whales (*Balaenoptera acutorostrata*) and pygmy blue whales (*Balaenoptera musculus brevicauda*). The study furthermore recounts that one specimen of young sei whale was entangled in a purse seine net and resulted in mortality. Despite the association of whales with freeschooling tuna, whale or dolphin associated sets are not included within the scope of the present UoC's, even though Echebaster vessels do carry out whale associated sets. Mortality (either direct or post capture) of whales is not generally known to occur in the unassociated freeschool fishery, although exceptional events may occur that could lead to occasional instances of mortality. It is also believed to be an uncommon occurrence in the whale associated set fishery. Delgado *et al* (2005) notes that analysing 336 days of observation data for Spanish purse seine vessels in the Indian Ocean, no instances of capture of whales or dolphins were apparent. Sets included both FAD and freeschool sets.

With respect to dolphin interaction with the fisheries, the freeschool set fishery of the Indian Ocean differs from that of the eastern Pacific in that freeschool sets are not normally made on dolphin schools in the Indian Ocean. This is especially the case with respect to the Spanish purse seine fleet who fish much more using FADs or on schools whose presence is indicated by bird activity. Evidence to this effect was provided to the assessment during discussions with Echebaster management and vessel skippers, an observer in the Seychelles and during communications with others involved in the fishery

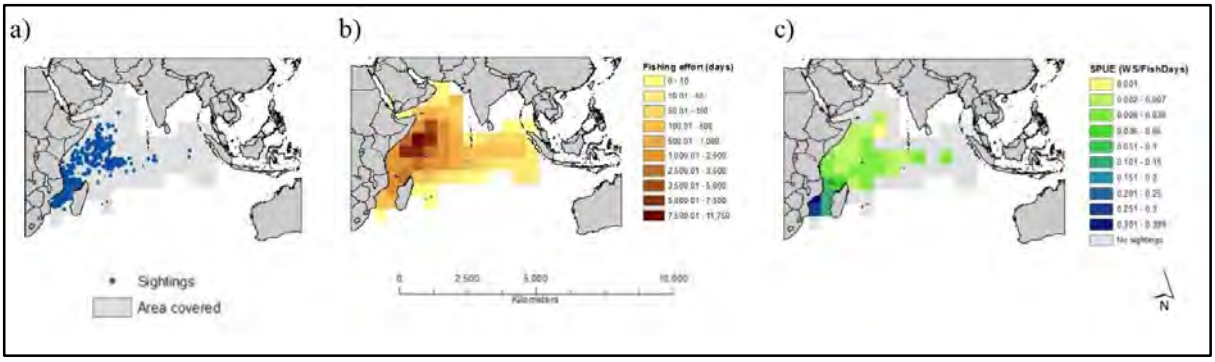
directly, as well as by reviewing Echebaster logbooks. It is inevitable that there would be some association between dolphins and tuna schools in the Indian Ocean as is the case in other areas, however, according to Ardill *et al* (2013), in practice tuna-dolphin association is rarely seen in the western Indian Ocean, such that skippers very rarely set on dolphin schools. The finding is based on analysis and review of extensive fishery data from the Indian Ocean. The study acknowledges that sets are routinely made on whales and on whale sharks associated with tuna schools, but these large animals generally either break their way out of the nets or are towed out alive. For Echebaster vessel skippers, the presence of freeschools of tuna is indicated by seabird activity on the surface of the ocean, rather than by the presence of dolphins. Se surface bird activity may be detected visually or using radar.

Capietto *et al* (2014) analysed the seasonal and spatial distribution of large marine mammals and whale sharks and tuna fishing activity in order to evaluate possible mortality associated directly with the fisheries in the Indian ad Atlantic Oceans. Results demonstrate seasonal and inter- annual variability in the distribution of fishing activity and observations of marine mammals and whale sharks. Areas of aggregations of organisms and specific seasons were highlighted. No particular association between fishing and dolphins was observed and it is commented that this is in contrast to the situation in the Pacific Ocean where dolphin sets are made. The impact of fishing on the mortality of whale sharks and mammals is considered to be extremely low, even approaching zero depending the organism, in the studied oceans. The nature and abundance of the data used provide a unique vision of these organisms distribution and fishing activities.

Whale sharks are listed on CITES Appendix II. In Seychelles waters, the Wild Animals (Whale Shark) Protection Regulations, 2003 declares the whale shark (*Rhincodon typus*) protected throughout Seychelles at all times. No specific data have been available to the assessment team in relation to encounters with whale sharks during Echebastar purse seine fisheries. However whale sharks are most likely encountered during sets deliberately made on them and not on freeschool sets. Nevertheless, while they are unlikely to be retained or feature as bycatch in freeschool sets on account of their size they have been included under the ETP component as whaleshark meets with ETP qualifying criteria and the species is undoubtedly vulnerable to fishing interactions. It is normal practice for these animals to be released from the gear prior to bringing catches aboard and there is no direct evidence to suggest that animals are directly harmed or killed in such encounters although clearly there is potential for such events to occur. The frequency with which this may happen however in freeschool sets is likely to be very low and possible population level impacts are therefore considered negligible. This finding is supported by evidence of Capietto *et al (2014).*

Useful information on the distribution of whale sharks in the Indian Ocean is provided by Sequeiraa *et al (*2010). The study presents results from an analysis of a 17-year time series of whale shark sightings in the Indian Ocean collected by the tuna purse-seine fishery relative to concurrent data describing chlorophyll *a* concentration and sea surface temperature (SST) extracted from composite satellite images. Prediction maps showed that within the sampled area, habitat use varies between seasons and follows a clockwise directional shift from autumn through to summer. In terms of habitat suitability, whale sharks move between different aggregation sites in the Indian Ocean. This supports the hypothesis that whale sharks in the Western Indian Ocean comprise a single super-population. By assessing the importance of temperature and productivity cues, the results of the study provide a basis for predicting pelagic distribution of whale sharks in the Indian Ocean, and further provides a baseline from which temperature-dependent predictions of future distributional changes can be made.

Figure 3.4.2 a) area sampled by IOTC purse seiners and total whale sharks sighted; b) associated effort in days spent fishing per 5˚square; c) Whale sharks Sightings Per Unit Effort – SPUE



Source; Sequira et al (2010). IOTC-2010-WPEB-18

Other species that may be encountered during freeschool sets exceptionally include giant manta. Giant manta are considered ETP species on account of the prohibition on their retention onboard EU vessels in all waters, as given in EU Regulation (EC) 40/2013. While it is possible that manta rays are captured and may suffer harm during their release from fishing gears, it is a sufficiently rare event so as to be considered negligible in its overall impact. The Echebastar vessels are highly likely to be compliant with EU regulations preventing the retention onboard of manta rays, and there are no records of manta rays being retained in the freeschool purse seine fisheries observer data reviews and analyses made available to the assessment team and referenced elsewhere in the report. In this context then the fishery is considered to meet with national and international requirements for the protection of giant manta rays. As for occasional instances where whale sharks may be encircled in purse seine gear, it is normal practice for these animals to be released from the gear prior to bringing catches aboard and there is no direct evidence to suggest that animals are directly harmed or killed in such encounters although clearly there is potential for such events to occur. The frequency with which this may happen however in freeschool sets is likely to be very low and possible population level impacts are therefore considered negligible.

Overall impacts of the freeschool tuna fishery on ETP are very low. However, there is a strategy in place to ensure the fishery continues to improve its performance in relation to ETP interaction management. The strategy comprises a range of measures, some of which are designed specifically to manage impacts of the fishery on non-target bycatch species (releasing large specimens from nets by dropping the float line, releasing large sharks from the deck where they are taken aboard, training for staff in bycatch reduction and impact mitigation, bycatch reduction research). At corporate level, Echebastar group demonstrate a commitment to ensuring the sustainability of the fishery and this is evidenced by internal strategic documentation and also by the number and nature of research undertakings Echebastar have commissioned or are involved in with respect to reduction of impacts on unintended bycatch species.

Within the IOTC a number of resolutions have been adopted that means flag nations are required to take initiatives to manage or reduce impacts on ETP species by purse seine and other fleets. Resolutions that are relevant in this regard include:

- 13/04 on the conservation of cetaceans;
- 13/05 on the conservation of whale sharks;
- 12/04 on the conservation of marine turtles;
- 12/09 on the conservation of thresher sharks;
- 11/04 on a regional observer scheme.

Resolutions contain a range of important measures that are designed to manage impacts and that are also intended to generate data in relation to interactions. The detail of the resolutions has been reviewed by the assessment team and it is considered that these represent important tools in the overall Indian Ocean tuna fishery ETP management strategy development. IOTC resolutions compliment more general measures contained in EU and Seychellois primary and secondary fishery legislation and which also play a role in management of fisheries interactions. Given the overall low level of risk associated

with both direct and indirect effects of the freeschool fishery on ETP species, the assessment team found that the management response was adequate to ensure that there are no significant impacts.

In terms of information that is available to support management of impacts of the fishery on ETP species, there is considerable qualitative and quantitative information available in relation to interactions with ETP species of EU purse seine fleets operating in the Indian Ocean. This allows for a reasonably good understanding of the ETP species involved as well a general understanding of levels of interaction and to a lesser extent the likely fate (outcome) for species from capture events. Examples of such data include a review of EU purse seine fleet observer data from 2003-2007 (Amande, 2008). Other sources of data include Echebastar group records of bycatch, results of investigations conducted by Echebastar group as well as a wide range of published studies e.g. Romanov (2002), Pianet (2006), Sarralde et al (2006) and Delgado de Molina et al (2005). The reports of the Working Party on Ecosystems and Bycatch of the IOTC (WPEB) provide a useful annually updated source of information in relation to bycatch information and research findings and needs for most groups of ETP species. Despite this, the assessment team found that there is inconsistent recording of interactions with ETP species by Echebastar vessels during freeschool fishery sets. The team considered that it would be appropriate that recording of all ETP interactions should be undertaken by Pesqueras Echebastar vessels during all freeschool tuna sets as part of standard onboard procedures, even where there are no interactions. Specific data for the fleet would allow fishery related impacts to be quantitatively estimated on an ongoing basis for ETP species and would help identify more clearly the risks by documenting capture rates for species, size distributions of ETP species, temporal and spatial patterns of interaction, response and outcome. In this regard, scoring of the ETP information PI has resulted in the raising of a condition of certification.

3.4.4 Habitat impacts.

Echebastar freeschool purse seine sets on tuna schools are made exclusively in relatively deep oceanic waters, well away from land and well above any underwater terrain. In this context then, the fishery is active in the epipelagic layer – the upper layers of the pelagic ecosystem where sufficient light penetration occurs so as to allow photosynthesis to take place.

Accordingly, the fishing gears do not impact the seafloor or any biogenic habitats such as coral reefs.

In terms of classification of the habitat within which the fishery occurs, Spalding *et al* (2007) proposes a system of bioregionalisation of coastal and shelf area marine ecoregions of the world and argues that biogeographic classifications are essential for developing ecologically representative systems of protected areas. The study is of limited relevance however to offshore areas of open ocean. Another well-regarded systematic approach to classification that is more focused on pelagic ecosystems, is the two-tier system developed by Longhurst (1998). This system is based on descriptions of pelagic bioregions based as biomes and biogeochemical provinces. Subdivisions are based on a detailed suite of oceanographic parameters, tested and modified according to a large database of chlorophyll profiles for the world's oceans. The results represent a comprehensive partitioning of the pelagic biota. According to the latter, boundaries of biogeographical or ecological regions in the ocean will be most pronounced where discontinuity in the physical environment is strongest. In the open ocean, this will be co-incident with the location of major fronts and frontal systems. The most important oceanic fronts for partitioning of biogeographic and ecological processes are polar, subtropical and equatorial systems. However, as oceanographers and biogeographers have long been aware, the dominant boundary and discontinuity in the ocean is a horizontal one, separating deeper layers from shallower ones. The discontinuity is represented by significant changes in water density (pycnoclines) associated with seasonal or permanent tropical temperature (thermocline) and /or salinity (halocline) gradients. This gradient or discontinuity is indicative of the change from epipelagic to deeper ecosuystems and is perhaps the over-riding feature of the three-dimensional biogeography of the open ocean.

It is within this epipelagic zone that tunas are most abundant and then often in close association with other vertical boundaries in the ocean, such as those represented by counter flowing currents as well as convergent and divergent currents, especially where the latter may be associated with upwelling of cooler, nutrient rich deeper waters which support primary production and therefore populations of forage species in the surface layers. The prevalence of boundaries represented by temperature discontinuity in particular significantly influences the distribution of different tunas throughout the oceans. Ardill (1984) suggests that tunas demonstrate clear associations with surface water temperature and dissolved oxygen regimes (Table 3.4.3). Sharp (1979) has, on the basis of long-term average sea

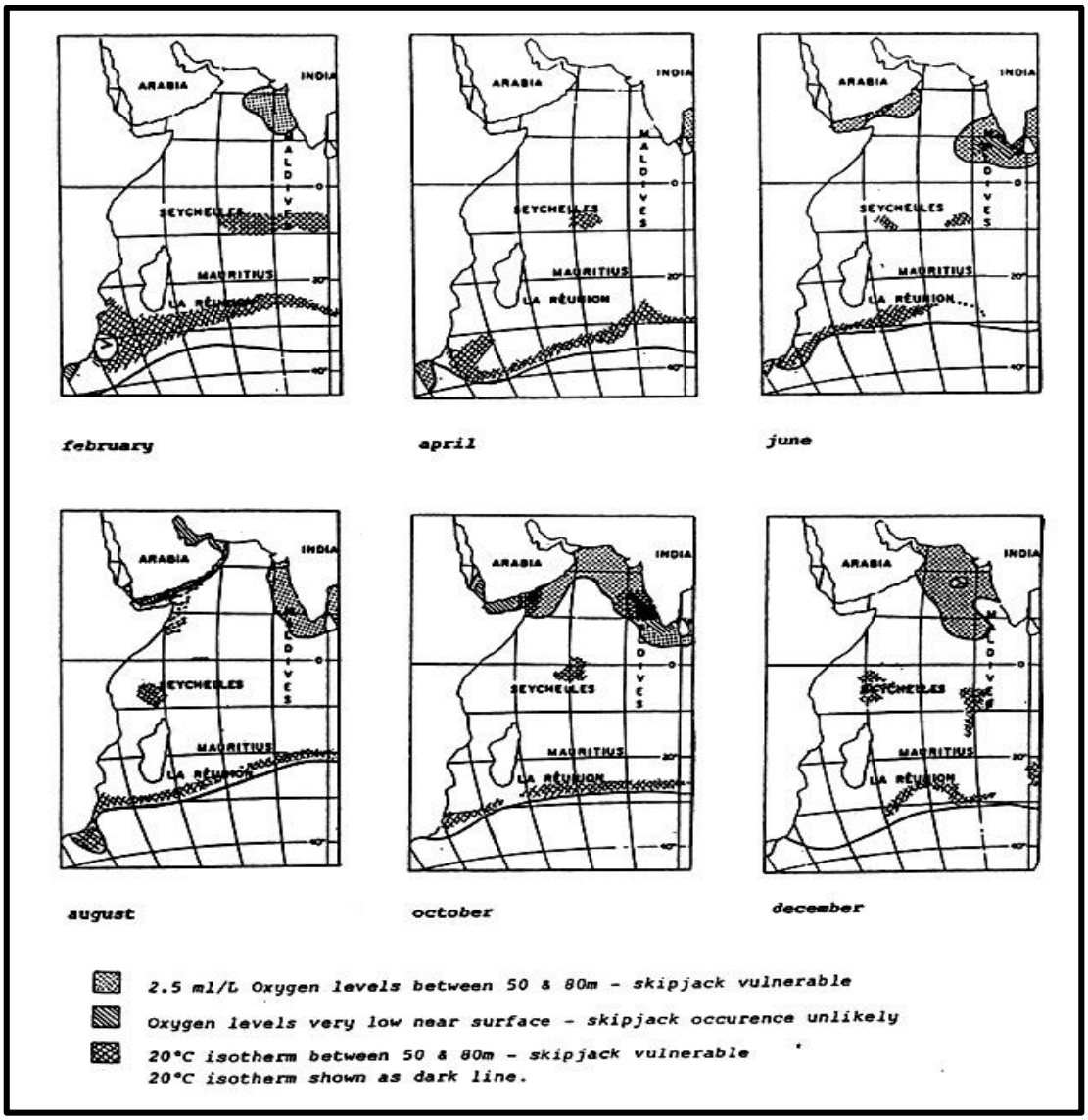
temperature and oxygen records predicted the areas of the Indian Ocean in which the various tuna species are seasonally accessible to surface fisheries (Figure 3.4.3a and 3.4.3b).

Table 3.4.3 Temperature and dissolved oxygen preferences for tuna species

Common name	Scientific name	Temperature preference°C	Oxygen tolerance ml/L
Skipjack	*Katsuwonus pelamis*	20-32	2.5-3.0
Yellowfin	*Thunnus albacares*	23-32	1.5-2.5
Big-eye	*T. obesus*	11-23	0.5-1.0
Albacore	*T. alalunga*	15-22	1.7-1.4
Little tuna	*Euthynnus affinis*	18-29	

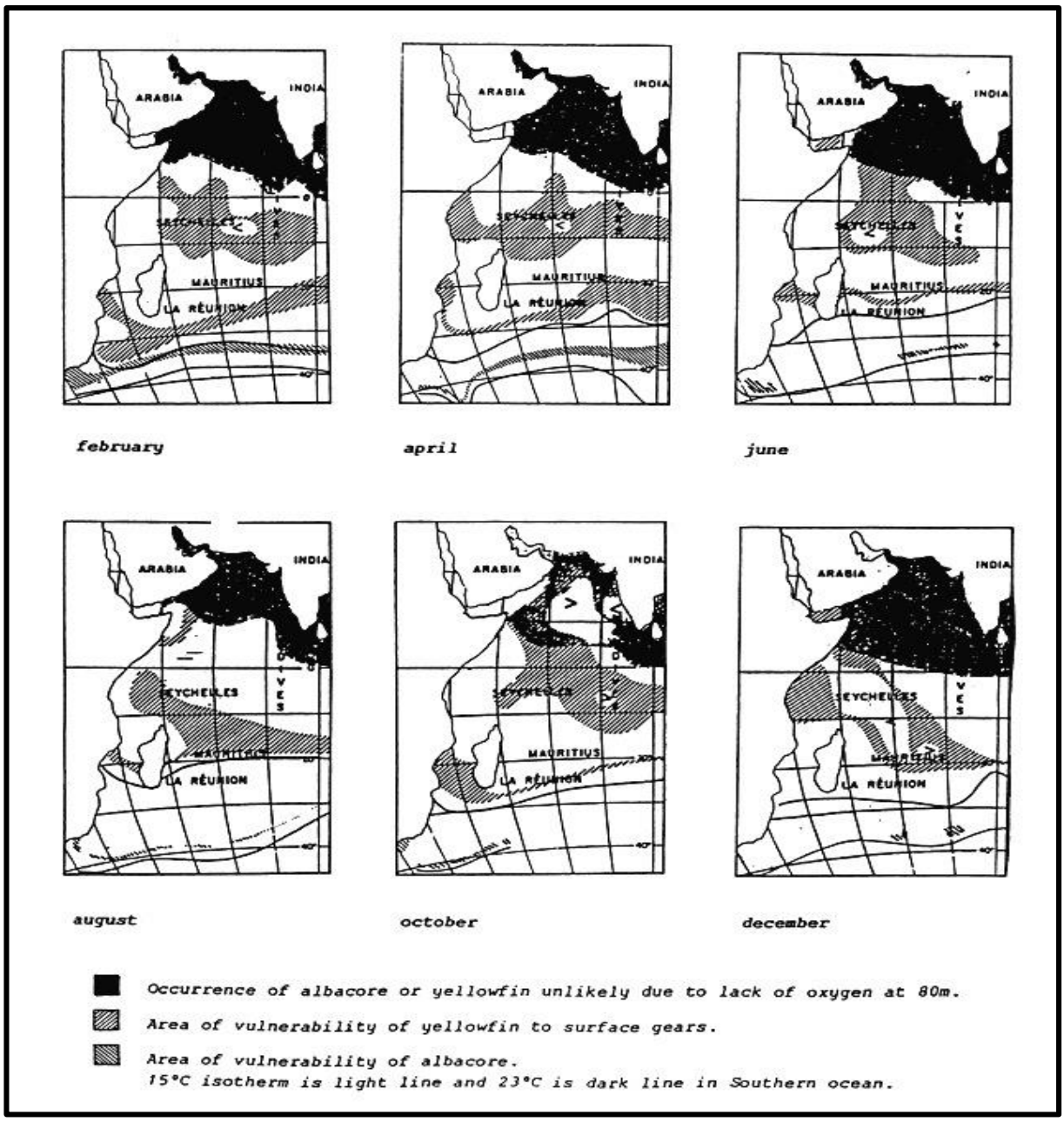
Source: from Ardill, 1984

Figure 3.4.3a Areas of vulnerability of skipjack to surface gears



Source: from Gray, 1979

Figure 3.4.3b Areas of vulnerability of yellowfin and albacore tunas



Source: from Gray, 1979

The most striking feature of the entire Indian Ocean region is the regular seasonal reversal of winds as a result of the monsoon, which in turn affects ocean currents in the northern hemisphere. The monsoon dominates the northern Indian Ocean climate, and its effects are widespread and apparent, even deep into the southern hemisphere.

The northeast or winter monsoon determines the climate of the northern Indian Ocean during the northern hemisphere winter (November to March). The winter monsoon is characterised by high pressure over much of Asia including the Indian sub-continent, leading to north-easterly winds over the tropics and northern subtropics, including the western Indian Ocean. By contract, the southwest or summer monsoon determines the climate of the northern Indian Ocean during the northern hemisphere summer (from June to September). A deep heat low-pressure system is associated with northern Arabia and Pakistan during this period, with high pressure over much of East Africa including Kenya and Somalia. Because of this, the winds in the northern Indian Ocean reverse completely from the north-easterly winds of the winter monsoon change to the southwest and act like an extension of the southern

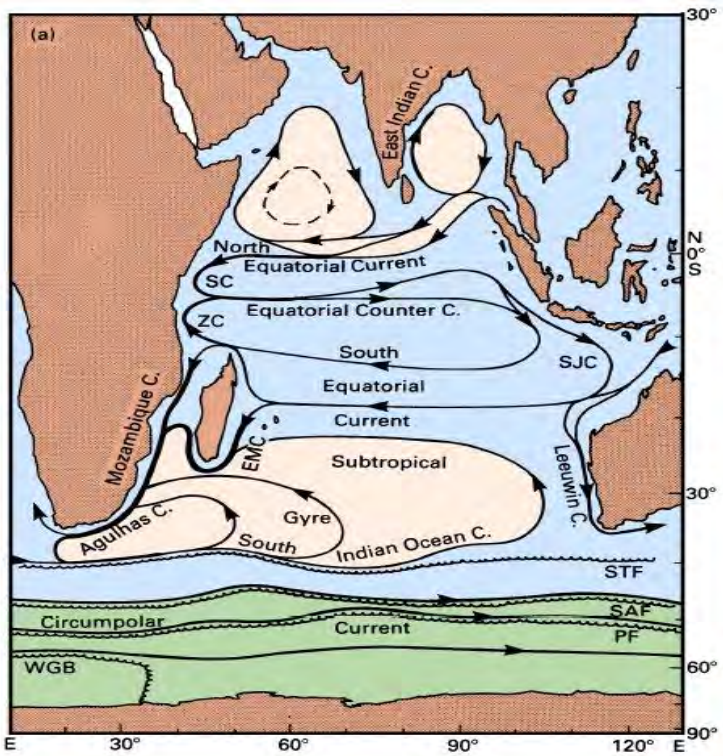
hemisphere tradewinds into the northern hemisphere. Winds may reach force 6 or more and blow steadily over the entire area of the western Indian Ocean north of the equator. The southwest monsoon causes much of the rainfall over India and the Himalayas and much of the supply of water that supports agriculture in much of southern Aisa including India and countries bordering the Bay of Bengal.

Ocean surface curculation is also heavily influenced by the monsoonal climates as described above. Two large oceanic gyre currents (one clockwise flowing in the northern hemisphere and an anticlockise gyre south of the equator) constitute the dominant flow pattern. During the winter monsoon currents in the north are reversed fromthise of the summer monsoon. In the deeper layers, water circulation is characterised primarily by inflows from the Atlantic Ocean, the Red Sea as well as by Antarctic currents. North of 20° S, the minimum surface temperatures are about 22 °C and may exceed 28 °C in the far eastern sections. South of 40° S, temperatures drop quickly due to influence from Anatrctic surface waters. Surface water salinity ranges from 32 to 37 parts per 1000, with the highest salinities occurring in areas of high evaporation such as the Arabian Sea.

Figure 3.4.4 is taken from Tomczak and Godfrey (2003) and shows typical cirulation pattrens for surface waters during the alternating summer and winter monsoon seasons. The authors who also give a detailed account of Indian Ocean currents and Indian Ocean upwelling phenomena. Winds at the equator change direction according to the season, but remain weak overall and throughout the year. Because of this, a wind driven divergence of surface currents along the equator does not occur and the conditions required for equatorial upwelling to occur do not arise. Strong equatorial downwelling occurs because of equatorial current convergence during the transitional months between northeast and southwest monsoons, when winds turn eastward on reaching the equator.

Conditions for coastal upwelling in the Indian Ocean arise along the eastern land mass boundary, where conditions similar to those giving rise to important upwelling regions of the Pacific and Atlantic Oceans are found. The strongest upwelling of the Indian Ocean occurs along its western coastline when the Southwest Monsoon produces strong Ekman transport away from the coast of the Horn of Africa and the Arabian Peninsula (see Figure 3.4.5). The associated offshore movement of surface waters causes deeper ocean waters to rise and replace surface layers driven away by strong winds.

Figure 3.4.4 a). Surface currents in the Indian Ocean during the northeast (winter) monsoon (from Tomczak and Godfrey, 2003).



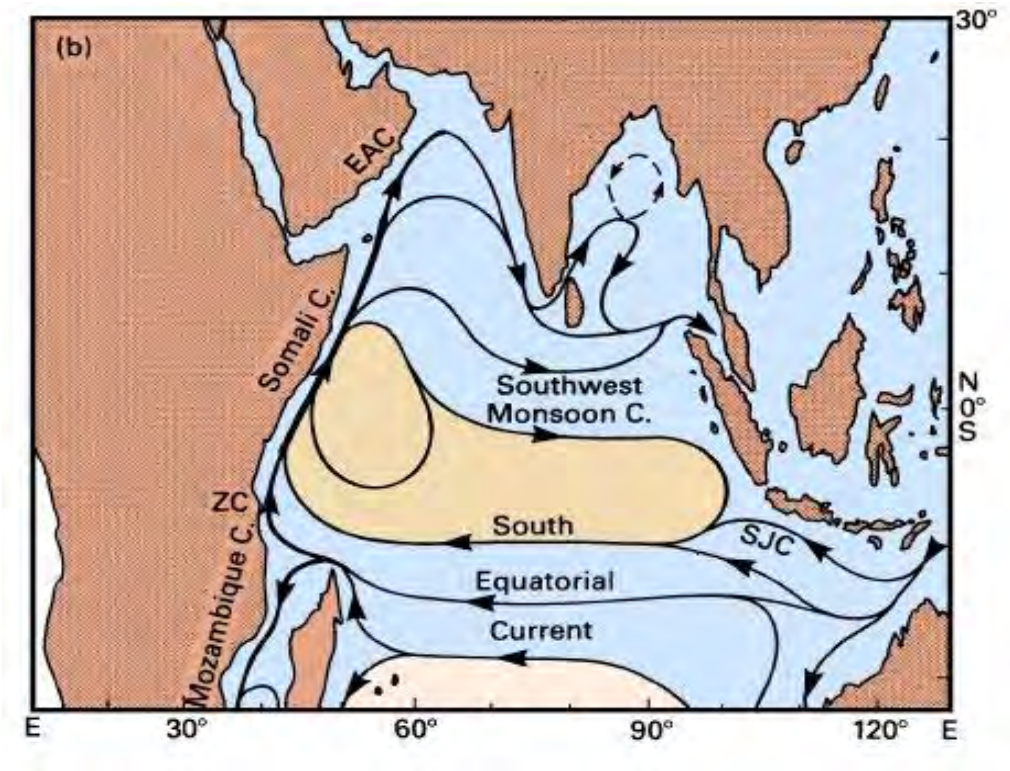
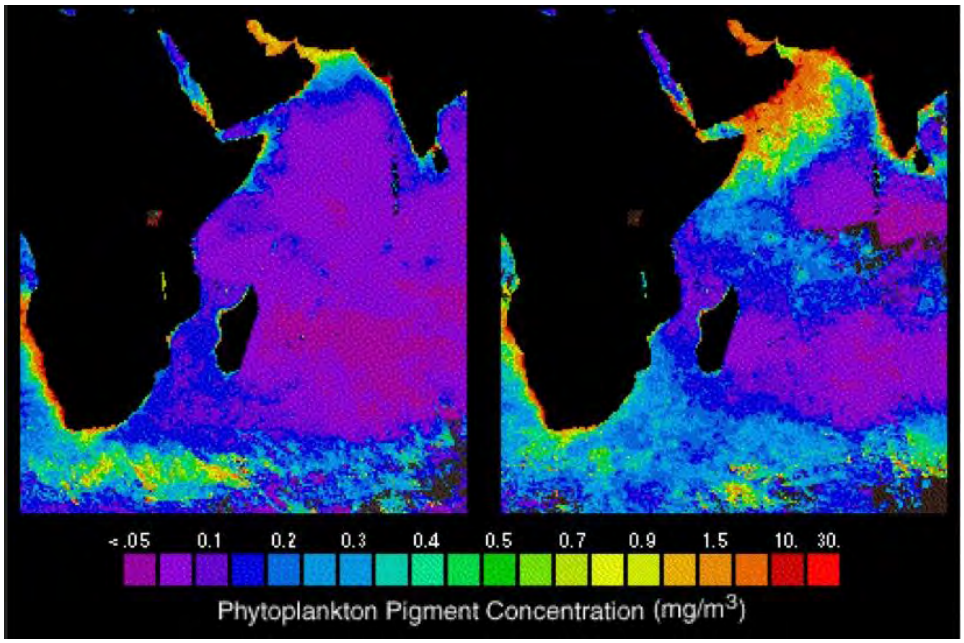


Figure 3.4.5. Surface phytoplankton production in the western Indian Ocean during the winter monsoon (left) and during the summer monsoon (right) currents in the Indian Ocean during the southwest monsoon (from Tomczak and Godfrey, 2003).



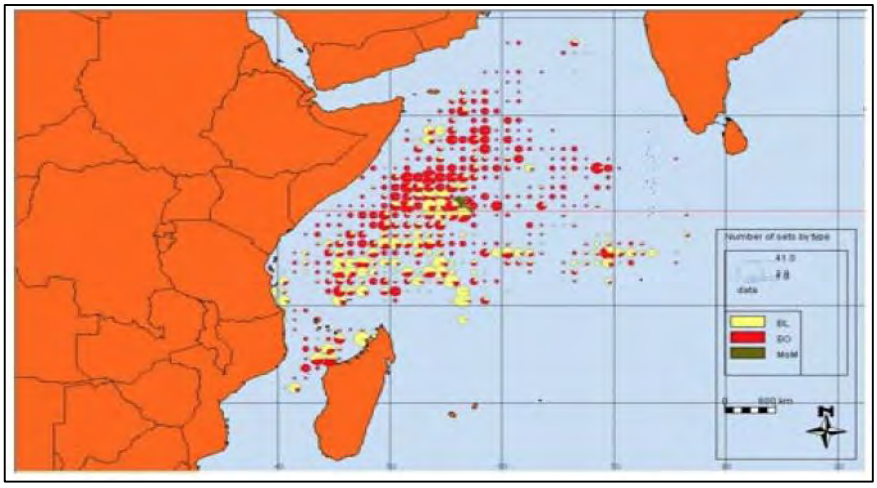
Source: NASA Sea Wifs

The Indian Ocean Dipole (IOD) phenomenon, also known as the Indian El Nino, is an irregular oscillation of sea-surface temperatures in which the western Indian Ocean becomes alternately warmer and then colder than the eastern part of the ocean. During IOD events, the western Indian Ocean will typically have above average sea surface temperatures, a deeper than average thermocline and lower than normal chlorophyll concentrations. The change in environmental conditions is believed to reduce overall productivity and amounts of available forage food, leading to unfavourable conditions for tunas

in the surface layers. As a consequence, the catch rates of purse seine tuna fleets operating in the Western Indian Ocean may be significantly reduced during such events. Such impacts on fisheries have been studies and are analysed for both longline and purse seine fisheries by Menard *et al* (2007), who demonstrates how environmental related effects may cause significant reductions in catches.

Figure 3.4.6 presents data from the EU observer programme for tuna purse seine fisheries in the western Indian Ocean and gives an idea of the location of fishing sets sampled (from Amande *et al*, 2008). In recent years, effort has been displaced to the west away from the Somali coast due to uncertain security situation associated with piracy.

Figure 3.4.6 Distribution of and number of observed sets by set type in EU fleets purse seine tuna fishery 2003-2007 western Indian Ocean (freeschool=BL, FAD=BO, Seamount=MsM)



Source: Amande et al., 2008

The assessment team have considered a range of information and data available in relation to the nature of habitat impacts that may be impacted by the fishery. It is apparent that there is no impact of the purse seine gear on the seabed habitat as the fishery takes place exclusively in surface layers. There are no records or data, which suggest that interactions occur with the seabed, even very rarely. Given that the conclusion has been that the gear has no has no physical impact with the seabed, it is appropriate that no particular management measures are in existence which are designed to avoid or mitigate impacts. Accordingly, there is also no particular requirement for ongoing collection of habitat data or fishery data specific to evaluating risks to habitats. The fishery has scored highly therefore for all habitats associated PI's on account of negligible impacts (if any) on seabed habitats, the lower level of management response required to contain risks as well as the lower overall informational requirement.

3.4.5 Ecosystem

The impacts of the fishery on retained species, bycatch, endangered, threatened and protected species as well as habitats have all been considered and described in previous sections. Other risks however exist and further impacts of the fishery may still arise at a higher ecosystem level, most notably those risks to ecosystem structure and function. Such impacts are considered under the ecosystem component of Principle 2.

Perhaps the most serious risk to ecosystem structure and function that can result from the operation of industrial scale fisheries such as tuna purse seine fisheries are large changes in food web dynamics related to the removal of significant proportions of key species, including key predator species.

Key species can be considered as species upon which the success of many other species is dependent, or on which overall normal and healthy ecosystem function depends on. Key prey species are those for which there is likely to be little by way of alternative species at the same or similar trophic level. Depletion of low-tropic level species upon which many higher-level organisms are ultimately dependent can lead to changes in food web dynamics and consequent shifts in fish fauna community structure. Conversely removal of higher trophic level species including predators such as tuna and sharks can lead to changes in food web structures and trophic cascades, where lower level species may increase in abundance, unchecked by normal predatory controls. Changes of this nature would be indicative of serious or irreversible harm at an ecosystem level.

There are a number of general texts and useful sources if information on the Indian Ocean ecosystem. Sherman *et al* (2009) describe the conditions of marine resources of the large marine ecosystems of the Indian Ocean and reviews their assessment, management and sustainability. Tomczak and Godfrey (2003) and Longhurst (2007) both provide good and informative reviews concerning the structure of the Indian Ocean ecosystem as well as the underlying biotic and abiotic elements and oceanography of the region.

A likely indicator of negative tuna purse seine fishery related impacts on the Indian Ocean ecosystem would therefore be changes associated with the removal or depletion of target tuna stocks and/or depletion of other high level trophic species (such as sharks).

Depletion of higher-level predators in the Ocean has been documented. Preliminary results of an analysis of abundance trends of several elasmobranch and teleost fish in the Indian Ocean pelagic ecosystem were presented to IOTC's WPEB meeting in October 2009, based on data from research longline cruises. A widespread decline in the abundance of top predators such as large pelagic sharks and tunas was demonstrated, as was the emergence of several mid-sized, lower-trophic-level species such as crocodile shark and lancetfish. The relative abundances of lancetfish and tuna showed a dramatic shift between 1960-1990 and 2000-2008, with tuna being replaced by lancetfish. During 1960-1990 there were 5 tuna to 1 lancetfish, now there is 1 tuna to 5 lancetfish.

This is considered to be likely related to removal of large numbers of top predators in directed shark fisheries as well as bycatch of sharks in certain tuna fisheries, especially longline fisheries, gillnet fisheries and to a lesser extent, those utilizing drifting artificial FADs (where unobserved capture of sharks is known to be a source of significant ongoing unrecorded mortality). The recorded decline in top predators is also due in part to declines in large pelagic tunas, especially southern Bluefin, bigeye and yellowfin tuna, but less so skipjack. Yellowfin (targeted in this fishery) has a trophic level of 4.3, while bigeye has a trophic level of 4.5 (www.fishbase.org). SKJ has a trophic level of around 3.8. Some changes in fish community structure within the pelagic ecosystem is considered unavoidable as a consequence of the fishing down of tuna stocks in the early period of industrial fishery development, and significant levels of removal of large tunas is directly attributable to the operation of the freeschool set purse seine tuna fishery. However, significant depletion of other top predators such as sharks is considered very unlikely to result from freeschool sets due to the confirmed low level of encounter and retention.

With respect to depletion of large tunas, the recovery of the Indian Ocean yellowfin tuna stock in recent years and demonstrated management of fisheries for all other large tuna species stocks at levels that are at or above Bmsy demonstrates some commitment to preventing further reductions in abundance of large tunas and therefore consequential further significant changes in Indian Ocean pelagic ecosystem and fish community structure attributable to removal of tuna. The improved status and stability of all stocks is indicative of success of overall management of tuna stocks through the IOTC structure and there is ongoing commitment and developments that point to future further improvements.

Catches of tuna in the freeschool fishery were significantly higher in the past, going back to the early to mid 2000's. Since then, significant changes have occurred in that drifting FADs were introduced into the fishery and are now used on a wide scale. The majority of Indian Ocean tuna purse seine fisheries are now based around the use of drifting FADs and some 90% of the purse seine catch is taken in FAD sets. In tandem with the reduction in landings of tuna from free school sets since the introduction of drifting FAD based fisheries in the Indian Ocean, the risks to the elements underlying ecosystem structure and function attributable to the freeschool tuna fishery have declined in overall and relative terms. The growth in landings from FAD based fisheries over the same time frame as the reduction in the freeschool fishery provides some evidence that the freeschool fishery is very much a minor contributor to overall purse seine tuna landings. Of itself, the freeschool fishery is therefore considered highly unlikely to disrupt the key elements underlying ecosystem structure and function.

There is no overall ecosystem management plan for the western Indian Ocean large marine ecosystem. However, within the fisheries, there is a range of measures in place in order to ensure that in combination with other fisheries, the freeschool set purse seine fishery does not cause serious or irreversible harm to ecosystem structure and function. At a strategic level, the Indian Ocean Tuna Commission is the RFMO tasked with management of tuna fisheries within its area of responsibility. The establishment of the RFMO is the most significant development in tuna fisheries management since the advent of high seas commercial fisheries and their industrialisation.

In the context of the IOTC management system, the implementation of the precautionary approach by IOTC in relation to management of tuna fisheries is amongst the most significant developments. The resolution includes requires the implementation of stock specific biomass target and limit reference points as well as the commitment to development and implementation of robust harvest control rules with an appropriate through the MSE process. A clear harvest control rule is key to limiting the impact of the fishery and to effective and binding control over fishing morality.

Other measures at IOTC level that contribute to ensuring that serious or irreversible harm is avoided include:

- capacity limitation of fleets
- spatial and temporal closures
- implementation of full catch reporting and elimination of IUU fisheries
- development of resolutions to ensure that efforts are made to reduce the bycatch of vulnerable species such as pelagic sharks, turtles, cetaceans and whalesharks
- collection of data and statistics in relation to tuna catches, bycatch, ecosystem component interactions and a range of other fishery specific criteria through mandatory reporting requirements as well as the operation of independent observer schemes
- ongoing research and investigations into impacts of tuna fisheries on the Indian Ocean ecosystem amongst IOTC members

3.5 Principle Three: Management System Background

Principle 3 of the Marine Stewardship Council standard states that:

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

In the following section of the report a brief description is made of the key characteristics of the management system in place to ensure the sustainable exploitation of the fishery under assessment.

3.5.1 Legislative framework

Echebastar is a tuna fleet company based in Spain but operating only in the Indian Ocean and focused on tropical tuna fisheries in international waters and Seychellois Exclusive Economic Zone (EEZ) with 6 vessels. Three of them vessels are flagged in Spain and they are included in the European Union Vessel Register. Other three vessels are flagged in Seychelles.

Given this, and for the purpose of this evaluation is necessary to take into account three legislative frameworks in a national and regional context:

1. Seychelles legal Framework: EEZ of Seychelles; three vessels flagged in Seychelles and EU-Seychelles Fishing Agreement and as part of IOTC members

2. EU and Spanish legal framework. Three Spanish flagged vessels in Spain fishing in International waters of Indian Ocean and also within of EEZ of Seychelles through the EU-Seychelles fishing Agreement in force. EU is also member of IOTC.

3. IOTC as regional umbrella for governance and take into decision in reference to the fishery management.

Seychelles legal framework:

Three of the Echebastar fishing fleet in the Indian Ocean are flagged in Seychelles through local owner companies. These vessels are subject to Seychellois fisheries legal framework.

Seychelles established its 200 mile Exclusive Economic Zone in 1977[2] , on the basis of the United Nations Conference on the Law of the Sea (UNCLOS)[3] , where it has full jurisdiction over natural resources.

The Seychelles is a signatory to the “Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 Dec 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks” (signed 4 Dec 1996 and ratified 20 Mar 1998).

In national context the main pieces of legislation regulating the fisheries and aquaculture sector in Seychelles are the Fisheries Act (1986), as amended in 2001 and the Fisheries Regulations (1987), as amended in 2007

The overall responsibility for the fisheries sector and its development will remain with the Ministry for Environment and Natural Resources through the Seychelles Fishing Authority (SFA). SFA, being the Government’s executive arm for fisheries and marine resources matters will continue to discharge its responsibilities and functions as defined by the Seychelles Fishing Authority (Establishment) Act, 1984[4]

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[2] Maritime Zones Act 1977, Act No. 15 of 1977

[3] United Nations Convention on the Law of the Sea of 10 December 1982 (UNCLOS). http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf

[4] http://www.sfa.sc/Legislations/SFA Establishment Act.pdf

Its main goal is to develop the fishing industry to its fullest potential and to safeguard the resource base for sustainable development. The long-term policy of the Government of Seychelles for the fishing industry is based in the "promotion of sustainable & responsible fisheries development & optimization of the benefits from this sector for present and future generations".

European Unión

Currently the EU fisheries policy is governed basically through of the recently adopted Common Fisheries Policy (CFP). This is the main legal Act from which will develop specific new policies including External Water. The new CFP was adopted in the end of 2013 but it has always been the backbone of the fisheries policy of the European Union since 1983.

One of the main tools of EU fishing policy to access to fishing stock in External Waters is the Fisheries Partnership Agreements (FPAs). Through FPAs, EU gives financial and technical support in exchange for fishing rights, with partner countries.

In the Seychelles' case, there is a FPA signed between EU and Seychelles Government in force. The EU tuna vessels can access to Seychellois water through this Agreement. The number of European vessels fishing for tuna and tuna-like species is 46 in total distributed as indicated in the next table.

Table 3.5.1 - Summary of EU-Seychelles FPA fishing possibilities for country (in number of vessels).

CURRENT PROTOCOL EU-Seychelles FPA					
Fishing possibilities					
	SPAIN	FRANCE	ITALY	PORTUGAL	TOTAL
Tuna seiners	22	16	2	-	40 vessels
Surface longliners	2	2	-	2	6 vessels

Source: EU DGMARE webpage

Other three Pesqueras Echebastar vessels are flagged in Spain and therefore subject to European Union fisheries legal framework. This fleet can to fish in international waters or in EEZ of riverine countries through fishing agreements or private licenses

EU flagged Echebastar vessels operate in the Seychellois EEZ within the terms of the agreement on fisheries between Seychelles and the EU signed in 2006 and the current protocol of 6 years of duration 6 years (18.1.2014 – 17.1.2020).

This Agreement establishes the principles, rules and procedures governing:

» economic, financial, technical and scientific cooperation in the fisheries sector with a view to introducing responsible fishing in the waters of Seychelles to guarantee the conservation and sustainable exploitation of fisheries resources, and developing the Seychelles fisheries sector,

» the conditions governing access by Community fishing vessels to Seychelles' waters,

» the arrangements for policing fisheries in Seychelles waters with a view to ensuring that the above rules and conditions are complied with, the measures for the conservation and management of fish stocks are effective and illegal, unreported and unregulated fishing is prevented,

» partnerships between companies aimed at developing economic activities in the fisheries sector and related activities, in the common interest.

In the regional context, the EU, represented by the Commission, plays an active role in six tuna and 11 non-tuna Regional Fisheries Management Organizations (RFMOs) included the Indian Ocean Tuna Commission.

Indian Ocean Tuna Commission (IOTC)

The IOTC is an intergovernmental organization responsible for the management of tuna and tuna-like species in the Indian Ocean. The Commission was established in 1993 at the 105th Session of the Council of the Food and Agriculture Organization of the United Nations (FAO) under Article XIV of the FAO constitution and The Agreement[5] was signed on November 25th 1993 and entered into force on the accession of the tenth IOTC Contracting Party, referred as Member, on March 27th 1996. The Financial Regulations were adopted in March 1997 and the Rules of Procedure were adopted in September 1997

IOTC has as objective to promote cooperation among the Contracting Parties (Members) and non-Contracting Cooperating Parties of the IOTC with a view to ensuring, through appropriate management, the conservation and optimum utilization of stocks covered by the organization's establishing Agreement and encouraging sustainable development of fisheries based on such stocks.

The Commission has four key functions and responsibilities which enable it to achieve this objective:

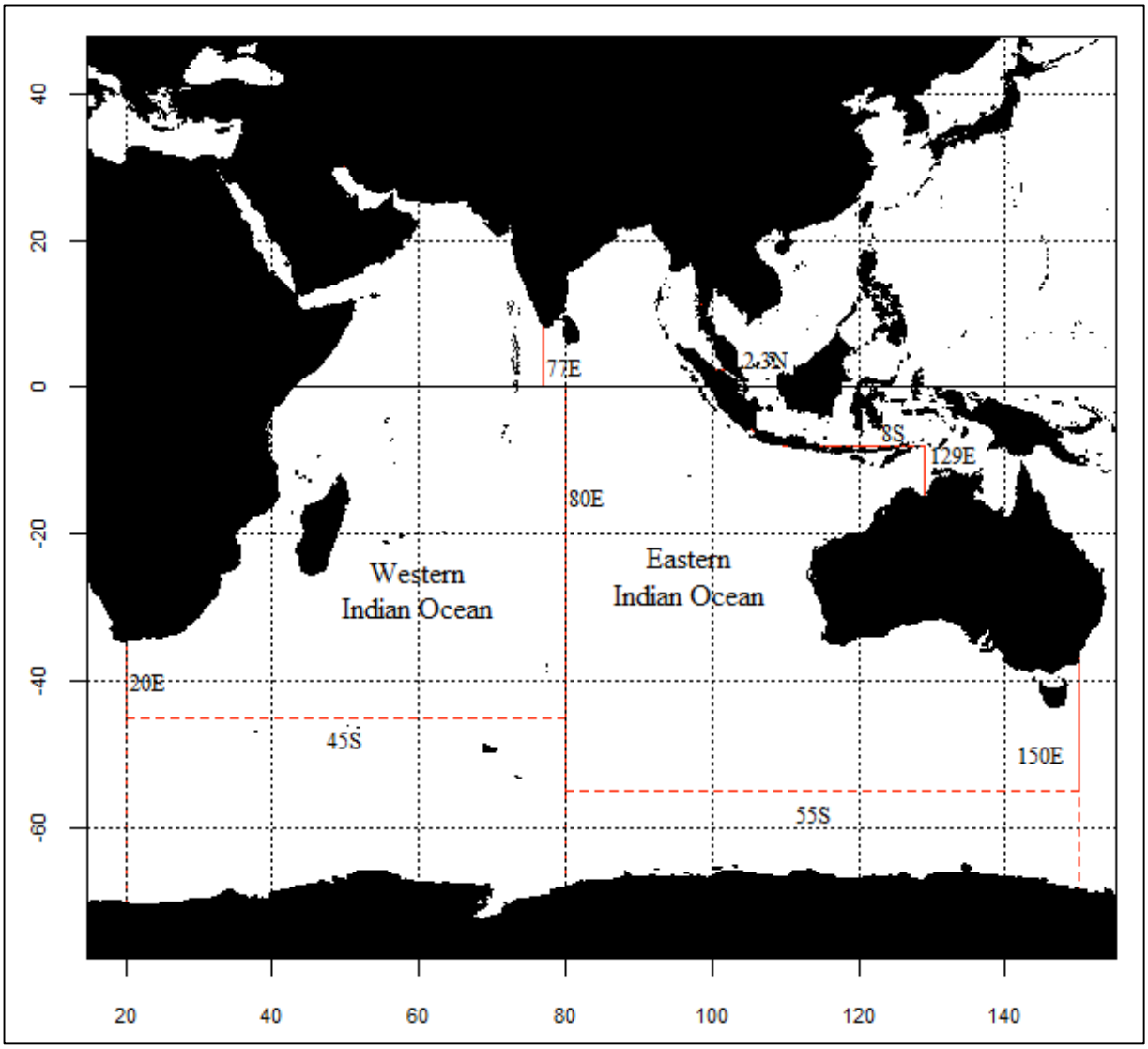
- to keep under review the conditions and trends of the stocks and to gather, analyse and disseminate scientific information, catch and effort statistics and other data relevant to the conservation and management of the stocks and to fisheries based on the stocks;
- to encourage, recommend, and coordinate research and development activities in respect of the stocks and fisheries covered by the IOTC, and such other activities as the Commission may decide appropriate,
- to adopt – on the basis of scientific evidence – Conservation and Management Measures (CMM) to ensure the conservation of the stocks covered by the Agreement and to promote the objective of their optimum utilization throughout the Area;
- to keep under review the economic and social aspects of the fisheries based on the stocks covered by the Agreement bearing in mind, in particular, the interests of developing coastal States.

Furthermore, in reference to Resolution of disputes, IOTC provides through Article XXIII of the Agreement (Interpretation and Settlement of Disputes) the basis for dispute resolution. To-date there has been no legal challenges to the IOTC or disputes which have had to be settled this way.

The area of competence of the FAO statistical areas 51 and 57 and adjacent seas and north of the Antarctic Convergence as shown on the next map:

[5] http://iotc.org/sites/default/files/documents/2012/5/25/IOTC Agreement.pdf

Figure 3.5.1 – IOTC areas of responsibility in eastern and western Indian Ocean (indicated by areas between red hatched lines)



Source: IOTC

Among the species under IOTC management, are the three included in this evaluation:

- » Yellowfin tuna Thunnus albacares YFT
- » Skipjack Katsuwonus pelamis SKJ
- » Bigeye tuna Thunnus obesus BET

Both EU and Seychelles are parties of the Commission.

3.5.2 Consultation, roles and responsibilities

There are at important number of organizations involved in the management of this fishery due to the international character of the same.

At Regional Context, IOTC define roles and responsibilities both its contracting parties and co-operating non-contracting parties ensuring that all organizations and individuals involved in the management process have been identified, with functions, roles and responsibilities are explicitly defined and, in general, these are well understood for key areas of responsibility and interaction for all the parties. Furthermore, Working Parties included the Scientific Committee and the Commission meet regularly seek and accept relevant information incorporating it managing system. The information for management system is provided for each part agrees to protocols and rules of the organization.

For EU context the number of stakeholders involved is high if well, Spanish administration management the Spanish fishing fleet under EU legal framework. Some of this organizations are: European (European Commission DG MARE, LDRAC) and Spanish (Secretariat of the Sea of the Ministry of Agriculture, Food and Environment, Fisheries administrations of regional governments of Bask country, ANABAC (National Association of Owners of tuna vessels freezers), CEPESCA (the Spanish Fisheries Confederation), AZTI, Spanish Oceanographic Institute - IEO).

Echebastar is member of ANABAC and CEPESCA. Both organizations are actively involved in the consultation processes via contact with Spanish authorities and Spanish scientific bodies.

ANABAC and CEPESCA participate actively in advisory boards, working groups and regular meetings both EU and Spain and as observer in IOTC meeting. In the EU and Spain, existing regulations facilitate and encourage stakeholders' participation in the management of fisheries.

Seychelles Fishing Authority is an important part of the set of organizations involved in the management of the fisheries. SFA is responsible of fisheries management in Seychellois EEZ being also part of the IOTC.

In general terms, the management system is very well known and all involved bodies are highly conscious of their role. Fishermen organizations and other stakeholders know adequately their role in the context of the fishery.

3.5.3 Long-term objectives

In the regional context, the main objective of IOTC, as reflected in its establishment Agreement is: "The Commission shall promote cooperation among its Members with a view to ensuring, through appropriate management, the conservation and optimum utilization of stocks covered by this Agreement and encouraging sustainable development of fisheries based on such stocks". Based in this, the way of IOTC since its establishment has been as clear objective to incorporate the most appropriate measures to achieve a long-term sustainable fishery. For this, long-term objectives are really included, as a whole, in the IOTC Conservation and Management Measures.

So Resolution 12/01[6] specified to apply the precautionary approach, in accordance with relevant internationally agreed standards, in particular with the guidelines set forth in the UNFSA, and to ensure the sustainable utilization of fisheries resources as set forth in Article V of the IOTC Agreement. Resolutions 13/10[7] and 12/14[8] establishes limit reference points and associated harvest control rules as part of a precautionary approach. Furthermore, there are evidences to apply precautionary approach

[6] http://www.iotc.org/cmm/resolution-1201-implementation-precautionary-approach

[7] http://www.iotc.org/cmm/resolution-1310-interim-target-and-limit-reference-points-and-decision-framework

[8] http://www.iotc.org/cmm/recommendation-1214-interim-target-and-limit-reference-points

and ecosystem based management in IOTC resolutions including by-catch reduction program or monitoring of ecosystem indicators.

Furthermore, the precautionary principle is explicit under the new EU's Common Fisheries Policy in force from 2014 but it was already contained in the previous CFP and the EU's new Integrated Maritime Policy is fully committed to an ecosystem-based approach to managing not just fisheries, but all human activities which impact on the health of our marine resources.

For Seychelles, SFA is responsible for the preparation, implementation and review of management plans for the long-term sustainability and optimal utilization of marine resources. Precautionary approach is frequently adopted to ensure the sustainability of resources since the baseline data on the status of certain stocks is lacking.

3.5.4 Incentives for sustainable fishing

IOTC, have not specific policies on incentives for sustainable practices if well the management of fisheries in a common umbrella provides benefits for the parties involved, not only for the authorities of the coastal countries but also for users. Cooperation between members is very important to improve management measures and this will benefit all parties.

Compliance committee Terms of Reference (Resolution 10/09[9]) shall develop a scheme of incentives and sanctions and a mechanism for their application to encourage compliance by all CPCs. However, currently this has not happened.

In reference to EU, currently the European Maritime and Fisheries Fund (EMFF) [10] is the fund for the EU's maritime and fisheries policies for 2014-2020. This fund has, among other goals, helps fishermen in the transition to sustainable fishing. In the past, EU incentives were used to increase capacity through the construction of new fishing vessels. But, currently, this possibility is forbidden.

3.5.5 Fishery specific objectives

Fisheries objectives are not well defined in general. Some reference points associated to interim values, have been adopted for several IOTC stocks through the IOTC Resolutions 13/10 and 12/14.

Despite of this lack of defined management objectives in this moment, must take into account the set of interim objectives existing, which could be derived from the IOTC convention text, other international agreements to which IOTC is bound (e.g. UNCLOS), and recent IOTC resolutions and recommendations. Structure of the Kobe plot usually applied in the IOTC and used the Reference point existing, taking account of the following objectives

- for stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant;
- for stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible;
- for stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible;

[9] http://www.iotc.org/cmm/resolution-1009-concerning-functions-compliance-committee

[10] http://ec.europa.eu/fisheries/cfp/emff/index_en.htm

» for stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible.

Only the MSY objective is well defined if well, but currently some IOTC Resolutions make specific reference to the precautionary approach and to long-term sustainable utilization of tuna stocks.

3.5.6 Decision-making processes

The fishery-specific management system has established decision-making processes that result in measures and strategies to achieve the fishery specific objectives. IOTC Rules and procedures specified the mechanism for each member can vote to adopt news measures and strategies. If well, some decisions are obtained for consensus because non-contracting parties cannot vote but are stakeholders involved in the fishery. The IOTC resolutions are built with the best scientific information available in conjunction with sound and clear scientific advice.

European Union also has a clear decision – making process for fisheries issues. Fisheries Agreement takes into account the best scientific information available and scientific advice to do the proposal. Furthermore, EU fishing vessels also takes part in the decision-making process through their relation with authorities of the EU and its member stats. There are different ways for this. One of them through Long Distance Regional Advisory Council [11] created as a way of guaranteeing the participation of the parts been interested in the process of production and development of the policies of fishing management. LD-RAC concretely, deals with questions relative to the agreements of fishing with third countries and the relations with the Regional Organizations of Fishing, that is to say, the exterior dimension of the PCP.

SFA has established decision making processes that result in measures and strategies to achieve the fishery specific objectives if well, the measures and strategies for these fisheries are approved within IOTC. For this, SFA has 4 sections directly involve with implementation of IOTC resolutions. The channel among IOTC and SFA is fast and clean.

3.5.7 Compliance and enforcement

IOTC has a Compliance Committee as an advisory body of the Commission, which was set up in 2003 but in 2009 are redefined its terms of reference.

The main activities of the Compliance Committee are as follows:

» Review all aspects of CPCs individual compliance with IOTC Conservation and Management Measures;

» Review information relevant to compliance from IOTC subsidiary bodies and from Reports of Implementation submitted by CPCs,

» To identify and discuss problems related to the effective implementation of, and compliance with, IOTC Conservation and Management Measures, and to make recommendations to the Commission on how to address these problems.

The primary responsibility of the Compliance Committee is to monitor compliance with respect to implementation of IOTC Conservation and Management Measures by CPCs. The monitoring is conducted through the assessment of reports provided by CPCs. In preparation for the meeting of the Compliance Committee the CPCs must send these reports to IOTC annually.

The basic structure of these reports includes the following information:

Figure 3.5.2 Contents of IOTC Compliance Committee annual report

Compliance Reports of IOTC
1. Implementation obligations
2. Management Standards
3. Reporting on Vessels
4. Vessel Monitoring System
5. Mandatory statistical requirement – Flag State CPCs
6. Mandatory statistical requirement – Coastal State CPC
7. Implementation of mitigation measures and bycatch of non-IOTC species
8. Illegal, Unreported and Unregulated (IUU) Vessels
9. Transshipment
10. Observers
11. Statistical document programme
12. Port inspection
13. Market

Source: IOTC

Member states adopted an IOTC Record of Authorized Vessels (Resolutions 02/0511 and 07/02[12]), a register of active vessels (Resolutions 98/0412 and 10/08[13)] and a list of IUU vessels (Resolutions 02/04[14] and 06/01[15)]. IOTC also adopted mandatory inspection programs in ports providing guidelines regarding its implementation (Resolutions 02/01[16] and 05/03[17]).

The use of VMS on all vessels over 15 m length overall is mandatory for all members (Resolution 06/03[18]). A regional observer program (Resolution 09/04[19]) based on a national but coordinated implementation at the regional level, both for industrial fisheries to craft was adopted in 2009.

Echebastar vessels are equipped with satellite-based vessel monitoring systems (VMS), which inform Spanish and EU authorities (Spanish flagged vessels) or Seychellois authorities (Seychelles flagged vessels) of the vessel's position at any given time. The fleet must report their catches to SFA or Spanish Administration.

Spanish administration has, among others attribution related with compliance and enforcement the integral control of fishing activity in the entire chain of production, import and marketing, the collection,

[11] http://www.iotc.org/cmm/resolution-0205-concerning-establishment-iotc-record-vessels-over-24-metres-authorised-operate

[12] http://www.iotc.org/cmm/resolution-9804-concerning-registration-and-exchange-information-vessels-including-flag

[1313] http://iss-foundation.org/wp-content/rfmo-uploads/IOTC-RES-10-08.pdf

[14] http://www.iotc.org/cmm/resolution-0204-establishing-list-vessels-presumed-have-carried-out-illegal-unregulated-and

[15] http://www.iotc.org/cmm/resolution-0601-establishing-list-vessels-presumed-have-carried-out-illegal-unregulated-and

[16] http://iss-foundation.org/wp-content/rfmo-uploads/IOTC-RES-05-03.pdf

[17] http://www.iotc.org/cmm/resolution-0503-relating-establishment-iotc-programme-inspection-port

[18] http://www.iotc.org/cmm/resolution-0603-establishing-vessel-monitoring-system-programme

[19] http://www.iotc.org/cmm/resolution-0904-regional-observer-scheme

processing and verification of information on the activities within the scope of the Common Fisheries Policy and the functions of fish inspection[20].

Despite this the level of compliance must be considered low with IOTC measures and obligations but there are currently no sanctions or penalties for non-Compliance in force.

3.5.8 Research plan

IOTC does not have a comprehensive research plan in force but the set of scientific recommendations based on analysis of scientific data collection of the fishery can be considered a basic research plan and the existing information is sufficient to develop the most appropriate management measures regarding the status of fishery resources.

IOTC Working Parties provide the SC with analyses of the situation of the stocks as well as an assessment of possible management actions.

The members of the IOTC Scientific Committee provide information about the catches of different species as well as information relating to by-catch and more. SC proposes the resolutions for it discussion in the SC meeting.

Moreover, in the EU there are different fisheries research institutes (IEO, IFREMER, AZTI, etc.) conducting research of fisheries in the IOTC area where European vessels are involved. The results of these investigations are discussed in the meetings of the SC and serve to develop recommendations and the decision-making process.

3.5.9 Monitoring and management performance evaluation

IOTC has implemented mechanisms to evaluate all parts of the management system by means of various committees and working groups that meet regularly and report their advances to the Commission. Furthermore through Performance Review Pannel (PRP) has also evaluated all parts of the management system.

However, Seychelles there are some mechanisms to evaluate key parts of the management system but not all areas are covered.

The European Union meanwhile has also reformed its CFP, based on regular assessments of its impact.

Spain also reports to the European Commission regularly on the relevance, coherence, efficiency and effectiveness of its fisheries management system. The European Union administration is subject to regular external audits from the European Court of Auditors (ECA) which is focused in financial management but it also considers other issues (efficiency, environmental issues, etc.).

Spain and the European Union as FAO member organizations take part in the FAO's Committee on Fisheries (COFI). The COFI is a subsidiary body of the FAO Council which examines the main issues and problems relating to fishery and aquaculture. It makes recommendations on a regular basis to governments, regional fishery organizations, NGOs, fishermen, the FAO and the international community.

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[20] http://www.magrama.gob.es/es/ministerio/funciones-estructura/organizacion organismos/Funciones_DG_Ordenación_Pesquera_tcm7-194140.pdf

4. Evaluation Procedure

4.1 Harmonised Fishery Assessment

At the time of writing, one MSC assessment had already been completed that overlaps geographically with this assessment (detailed below) and findings presented in published assessment reports. In addition two further MSC assessments overlapping this fishery are currently underway (also detailed below).

A further assessment report (PNA Western central Pacific Ocean skipjack tuna) overlaps with some Principle 2 elements of the present fishery (gear type – purse seine sets on freeschool tunas).

These formed an important background resource for the assessment team - collating and reporting on available stock and fishery information, as well as highlighting areas of stakeholder and assessment team concerns.

Completed assessments:

» Maldives pole & line skipjack tuna

http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/indian-ocean/maldives_pole_line_skipjack_tuna

» PNA Western and Central Pacific skipjack tuna

http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/pacific/pna_western_central_pacific_skipjack_tuna (PNA skipjack WCPO)

Assessments in progress

» Maldives pole and line yellowfin tuna expedited P1 audit P&L expedited P1 YFT - http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/indian-ocean/maldives_pole_line_skipjack_tuna

» Maldives handline yellowfin tuna Maldives handline assessment - http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/Indian-ocean/Maldives-handline-yellowfin-tuna

4.1.1 Harmonisation Details

Harmonisation meeting/s

A number of harmonisation discussions have been held with Intertek Fisheries Certification (IFC) concerning harmonisation of P1 scoring and reporting processes for the concurrent yellowfin and skipjack tuna assessments.

The first conference was held on November 13th 2013 and team Leaders and P1 experts from both assessment teams attended the discussions. At this point it became apparent that the IFC expedited yellowfin tuna P1 audit was significantly ahead of the present fishery in terms of reporting stages. IFC had completed scoring and were awaiting peer review prior to holding in depth discussions and releasing scores.

In the circumstance's, P1 for the present fishery was scored during February 2014, prior to IFC releasing the final scoring for the expedited P1 audit. Subsequently, IFC and FCI exchanged P1 scores and justifications for yellowfin tuna during June 2014. A further teleconference was held with IFC on June 23rd 2014 during which time scores, justifications and conditions of certification were reviewed for both fisheries (P1 only).

As a result of the P1 harmonisation discussion for Indian Ocean yellowfin tuna, the present assessment of P1 follows closely the scoring and justifications as well as condition setting for the previously scored IFC pole and line expedited P1 Indian Ocean yellowfin tuna audit.

No harmonisation was relevant or possible in the context of Principle 2 between the Maldivian fisheries as different gear types were being used. Nevertheless, the team reviewed and considered the scores for Principle 2 in the PNA skipjack tuna assessment freeschool set Unit of Certification. Scoring outcomes have been harmonised with that fishery in the context of ensuring similar outcomes for similar gear types being used to target freeschools of skipjack tuna. Where appropriate P2 scores have been

harmonised however the fisheries have significant differences not only in geographic terms but also in the manner that freeschool sets are made. Dolphin sets are common in the WCPO however, no dolphin sets occur in the Indian Ocean EU tuna purse seine fleet fishery.

With respect to Principle 3, the present assessment has harmonised with aspects of the Maldivian pole and line skipjack certification, where this has been appropriate considering jurisdictional differences. No P3 harmonisation with scoring outcomes was possible with respect to the Maldivian handline yellowfin tuna assessment that is in progress. CI3.2.3.1 states that here an assessment overlaps with a certified fishery or fishery in assessment that a CAB has already scored, the team shall base their assessment on the rationale and scores detailed for the previously scored fishery. While this has been carried out with respect to P1 and P2, it has not been possible to harmonise effectively with P3 for the Maldivian handline yellowfin tuna fishery which is ahead of the current fishery timeline.

An additional round of harmonisation meetings took place with IFC from November 2014 onwards focused mainly in the outcome of PI 1.2.2 across all three species and initiated firstly to focus particularly yellowfin as a result of the IFC Maldive assessment being subject to an expedited assessment to bring yellowfin into the pole and line certification. FCI re-inforced its view that it was still supportive of its stance with regard to scoring PI1.2.2 using CRv1.3 with a proposed score of 60.

On 24th November 2014 MSC issued what it termed ‘special advice’ to all CABs. This notification stated:

Scoring of ‘available’ Harvest Control Rules (HCRs) in CRv1.3 fisheries – Important Information

Following examination by ASI of a complaint raised by a Stakeholder, MSC is aware that there has been some variability in the interpretation and scoring of PI 1.2.2 (CR v1.3, v1.2, v1.1). A number of certified fisheries have been scored as meeting 1.2.2 scoring issue (c) using an interpretation that harvest control tools are available but not necessarily in use within the fishery, which was not in accordance with the requirements in CR v1.3. This incorrect interpretation has not been used by all CABs or assessment teams.

The issue of HCRs was debated between all stakeholders during the recent Fishery Standard Review (2013-2014), and resulted in MSC’s new fisheries standard version 2.0 (1 October 2014) providing clarification as well as additional explicit requirements for scoring PI1.2.2. Version 2.0 maintains the previous general requirement whereby a 60 score can be achieved by the HCR being ‘generally understood and in place’ but also allows HCRs to be only ‘available’ in the specific situation that the stock has been above BMSY for a recent period of time and is not expected to decline below BMSY in the medium term (i.e. where B>BMSY and F<FMSY; and in some other special cases). However, to be ‘available’ HCRs must be effectively used in some other fisheries under the control of the management body, or there must be an agreement in place to adopt an HCR before the stock declines to BMSY.

MSC advises that to avoid promulgation of the incorrect interpretation of PI1.2.2 under v1.3 (or earlier versions) and also to avoid conflicting harmonization conclusions between fisheries using v1.3 and v2.0, any CABs that identify certified or in-assessment fisheries scored using v1.3 or earlier that they consider have used the early misinterpretation of PI1.2.2 may rescore them using the clarified requirements set out in PI1.2.2 version 2.0. Scoring justification should be made explicitly addressing paragraphs SA2.5.2-2.5.3 and SA2.5.5-2.5.7.1 and associated guidance from v2.0, as related to the scoring of the SG60 level in scoring issues (a) and (c). CABs should advise MSC for which fisheries they intend to do this.

In order to avoid disruption to fisheries and CAB activities, MSC advises CABs to undertake this activity at an early opportunity, including for instance at their next surveillance audit, but that an expedited audit may not be necessary. Harmonisation discussions should be held where appropriate between CABs in the case of overlapping fisheries.

These changes should only affect the SG60 scoring level. MSC does not expect that any changes to conditions or action plans should result from this action.

In order to avoid complications of harmonisation between different versions of the standard, MSC strongly advises any fishery for which the above solution is adopted to apply Version 2.0 in its entirety at the next reassessment. In particular, CABs should note that the v2.0 guidance recognizes that the timescales for closing out conditions may be relaxed in the case that stock abundance remains high (above BMSY levels, again with the expectation that it will not decline rapidly, i.e. F<FMSY) and HCRs are regarded as ‘available’ but not yet ‘well defined’ (see guidance in FCR section GSA2.5.2-2.5.5, page 397). CABs should note that extensions to existing PI1.2.2 condition timelines beyond a

recertification date on the basis of this guidance shall only be accepted for fisheries undertaking reassessment against v2.0 in its entirety.

Fisheries completing their conditions at reassessment will no longer need to apply the 2.0 interpretation to PI 1.2.2 and may continue to undertake reassessment against v1.3, if applicable (i.e. if reassessment takes place before 1 October 2017).

FCI took the view that it was happy with its interpretation of PI 1.2.2 CR v1.3 and on 5th December FCI published its PCDR.

On the same day FCI was informed that IFC had decided to use the special advice and revise their Maldive pole & line tuna expedited yellowfin audit PCR in light of the MSC advice and use CRv2.0 to score PI 1.2.2 at SG60.

On 24th February 2015 as a result of stakeholder comment received by FCI during the consultation phase following publication of the PCDR as well as stakeholder input received by IFC as a result of publication Maldive pole & line tuna expedited yellowfin audit PCR, communication was initiated between IFC, FCI and MSC who made it clear that they felt that harmonisation between the two fisheries was not yet completed.

The key issue being that when the PCR (IFC) and the PCDR (FCI) were published in December the rationales provided, and the trees used (at least for PI 1.2.2) were still different between the two teams. IFC had decided that effective tools were not present, but were available, and that the requirements of V2.0 “available” language (stock status and projection) were met. FCI, however, decided at the time that effective tools were present. Thus although the final scores for PI1.2.2 were the same the means of getting there was different.

In addition there was concern that one of the conditions raised against both assessments were not harmonised. At the meeting between representatives of FCI, IFC and MSC held on the 26th February it was agreed the actions that needed to be implemented to harmonise the conditions, FCI’s conditions were to remain unchanged from that published in the PCDR.

It was also agreed that the two teams from FCI and IFC would hold further harmonisation talks to bring the situation up to date, review stakeholder comments, analyse recent new stock status related information that had become available since the publication of the reports in early December.

In the interests of a trying to ensure harmonisation has been completed, IFC and FCI asked their teams to revisit and compare the scoring rationales and scores for PI 1.2.2 in the current versions of the reports and consider if their views remain the same with respect to using v 1.3 or v 2.0; and secondly the scoring rationales.

On 2nd March following e-mail exchanges between the Principle 1 experts of both teams FCI were of the opinion that the situation that allowed IFC to score PI 1.2.2 SG60 using CR v1.3 had now materially changed and consideration needed to be given to the potential to utilise the ability to score PI1.2.2 SG60 using CRv2.0.

Follow up conference calls on the 5th and 10th March 2015 involving the team leaders and P1 experts from both FCI and IFC again thoroughly considered all the evidence around the scoring of the yellow fin PI1.2.2 which successfully reached a proposed agreed approach between the two CABs for the scoring of this PI.

A final harmonisation conference call was held on 19th March, to confirm that both experts had formalised their proposed wording to agree with each other and therefore that harmonisation had finalised with the same approach was being taken by both teams for the scoring of PI1.2.2 SG60 for yellowfin and skipjack.

The agreed scoring and rationale is included in this Final assessment report

Meeting Outcomes

Conditions under P1 have been harmonised with both the Maldivian skipjack and expedited yellowfin P1 assessments.

Discussions and sharing of information in relation to P1 has been substantive and has resulted in co-ordinated outcomes for yellowfin and skipjack P1 as well as a co-ordinated assessment process.

4.2 Previous assessments

This is the first MSC assessment for this fishery.

4.3 Assessment Methodologies

This fishery was assessed using version 1.3 of the MSC Certification Requirements and version 1.3 of the MSC Full Assessment Reporting Template. However, following the MSC Notice, "Scoring of 'available' Harvest Control Rules (HCRs) in CRv1.3 fisheries" of 24th November 2014, PI 1.2.2 SI a and c are scored using CR v2.0 provisions for SG60 scoring. The notice provides for scoring using CR v2.0 at 1.2.2a and c, but is aimed at avoiding 'incorrect interpretation' at CR v1.3 PI 1.2.2c. It is also aimed at ensuring consistency between assessments that are being harmonized (as is this assessment).

4.3.1 Assessment Tree

The default assessment tree was used in this assessment, for all stocks.

4.4 Evaluation Processes and Techniques

4.4.1 Site Visits

During week commencing 23 September, 2013, 3 members of the assessment team, supported by an FCI staff member, undertook a site visit to Port Victoria (Mahe), Republic of Seychelles and a further site visit took place during week commencing 4 November, 2013 to Spain. This enabled a scheduled programme of consultations to take place with key stakeholders in the fishery – including skippers, scientists, fishery protection officers, NGOs, fishery managers and technical support staff. Prior notification of this site visit was issued on the MSC website and in the Nation Newspaper (Mahe) in order that all relevant stakeholders were aware of the opportunity to meet with the assessment team.

Itinerary of field activities

Day 1 – 24th September, Port Victoria, Seychelles

» On day 1, the assessment team met with the client organisation aboard the vessel *Demiku/* - this was to provide further detail on the fishing methods, bycatch species and rates and practice in use under this fishery assessment and to give the vessel skippers / owners and opportunity to provide any feedback or comments they wished in an open and transparent manner. In addition, the team met with the Seychelles Fishing Authority to discuss the fishery under assessment and provide an opportunity for interested parties to submit comments, additional information or ask questions of the assessment team.

Day 2 - 25th September, Port Victoria, Seychelles

» On day 2, the assessment team met with the Indian Ocean Tuna Commission and WWF Madagascar and Western Indian Ocean Programme Office to discuss the fishery under assessment and provide an opportunity for interested parties to submit comments, additional information or ask questions of the assessment team.

Day 3 - 26th September, Port Victoria, Seychelles

» On day 3, the assessment team met with Dr Emanuelle Chassot of IRD, Chair of the IOTC Working Party of Data Collection and Statistics visited and visited the vessel Elai Alai from the client group specified under the Unit of Certification and met privately with 2 vessel skippers. This was to provide further detail on the fishing methods, bycatch species and rates and practice in use under this fishery assessment and to give the vessel skippers / owners and opportunity to provide any feedback or comments they wished in an open and transparent manner.

Day 4 - 5th November, Madrid, Spain.

» On day 4, the assessment team met with the Fisheries Secretariat of the Spanish department of Agriculture, Fisheries and Food to discuss the fishery under assessment and provide an opportunity for interested parties to submit comments, additional information or ask questions of the assessment team.

Day 5 – 6th November Spain

» On day 5, the assessment team held discussions and reviewed collated and collated information in private while also hosting a teleconference call with stakeholders (see below).

Day 6 - 7th November, Bermeo, Spain

» On day 6, the assessment team met with the Dr Hilario Murua, Principal Investigator AZTI Tecnalia and Chair of the Working Party on Tropical Tunas of Indian Ocean Tuna Commission to discuss the fishery under assessment and provide an opportunity for interested parties to submit comments, additional information or ask questions of the assessment team. Also to conduct a SICA qualitative risk assessment under PI 2.1.1.

» On day 6 the team also met with Dr Jon Ruiz, researcher at AZTI Tecnalia to discuss the fishery under assessment and provide an opportunity for interested parties to submit comments, additional information or ask questions of the assessment team. Also to conduct a SICA qualitative risk assessment under PI 2.1.1.

Day 7 - 8th November, Madrid, Spain

» On day 8 the assessment team met with the Mr Carlos Aldereguia of the Long Distance Regional Advisory Council (LDRAC) to discuss the fishery certification and to provide an opportunity for the team to gather further information in relation to scoring a number of performance indicators.

Additional individuals contacted during field activities

» A conference call was hosted with Maurice Brownjohn of PNA Western and Central Pacific Skipjack Tuna unassociated and log set purse seine fishery assessment on September 26th 2013 to discuss the fishery under assessment and provide an opportunity for interested parties to submit comments, additional information or ask questions of the assessment team.

» A conference call was hosted with Dr Alejandro Anganuzzi, former secretary of IOTC on 5/11/2013 to discuss the fishery under assessment and provide an opportunity for interested parties to submit comments, additional information or ask questions of the assessment team.

» A conference call was hosted with Dr Jose Castro Hernandez of Grupo de Investigacion en Biodiversidad y Conservacion, Universidad de Las Palmas de gran Canaria on 25/9/13 in order to discuss the fishery under assessment and provide an opportunity for interested parties to submit comments, additional information or ask questions of the assessment team. Also to conduct a SICA qualitative risk assessment under PI 2.1.1.

» On November 8th, the team held a conference call with Mr Raul Garcia of WWF Spain in order to discuss the fishery under assessment and provide an opportunity for interested parties to submit comments, additional information or ask questions of the assessment team.

4.4.2 Consultations

Stakeholder issues

Written and verbal representations were provided to the assessment team expressing a range of views, opinions and concerns. The team is of the view that matters raised have been adequately debated and addressed as a part of the scoring process for this fishery, and that none of the issues raised, therefore, require separate attention beyond that represented in this report.

Interview Programme

Following the collation of general information on the fishery, a number of meetings with key stakeholders were scheduled by the team to fill in information gaps and to explore and discuss areas of concern.

Meetings were held as follows:

Table 4.4.1: Interview Programme

Name	Position	Organisation
Unai Ganzedo	client representative	Pesqueras Echebaster
Mr Julian Marques Etxbarria	Fleet Inspector	Pesqueras Echebaster
Mr Jose Ramon Cardoso Elusrondon	Skipper (Patrun) Demiku	Pesqueras Echebaster
Alfonso Mouco Martinez	Captain Demiku	Pesqueras Echebaster
Rondolph Payet	Executive Secretary	Indian Ocean Tuna Commission
Gerard Dominguez	Compliance Coordinator	Indian Ocean Tuna Commission
David Wilson	Deputy Secretary / Science Manager	Indian Ocean Tuna Commission
Miguel Herrera	Data co-ordinator	Indian Ocean Tuna Commission
Dr Emanuel Chassot	Researcher	Institut de recherche pour le développement
Mr Jan Robinson	Researcher	Independent
Mr Maurice Brownjohn	Client Representative	PNA MSC skipjack tuna assessment
Mr. Vincent Lucas	Senior Fisheries Officer	Seychelles Fishing Authority
Mr. Roddy Allisop	Manager (Monitoring & Control)	Seychelles Fishing Authority
Dr Wetjens Dimmlich	Indian Ocean Tuna co-ordinator	WWF Madagascar and Western Indian Ocean
Katherine Reid	Snr Fisheries Policy Officer Indian Ocean	WWF Madagascar and Western Indian Ocean
Dr Alejandro Anganuzzi	Independent Stakeholder	Ex IOTC Chair
Dr Hilario Murua	Principal Investigator	AZTI Tecnalia
Jon Ruiz	Researcher	AZTI Tecnalia
Carlos Moreno	Deputy Director	Department of Agriculture, Fisheries and Food - Fisheries Secretariat
Jose Luis Sanchez	Deputy Director general for Control and surveillance	Department of Agriculture, Fisheries and Food - Fisheries Secretariat
Isabel Parra	Head Fisheries Control Management	Department of Agriculture, Fisheries and Food - Fisheries Secretariat
Laura Prieto	Fisheries Inspector	Department of Agriculture, Fisheries and Food - Fisheries Secretariat
Jose Manuel Lorenzo	Fisheries Inspector	Department of Agriculture, Fisheries and Food - Fisheries Secretariat
Carlos Ossorio	Fisheries Inspector	Department of Agriculture, Fisheries and Food - Fisheries Secretariat
Juan Leston	Fisheries management Control	Department of Agriculture, Fisheries and Food - Fisheries Secretariat
Mr Kepa Etxebarria Elizondo	Chief Executive	Pesquera Echebastar
Mr Juan Basagotti Aguirre	Departmento Commercial	Pesquera Echebastar
Mr Miguel Angel Varas	Financial director	Pesquera Echebastar
Mr Carlos Aldereguia	Executive Secretary	Long Distance RAC
Mr Raul Garcia	Fisheries manager	WWF Spain
Dr Jose J. Castro Hernández	Senior researcher/Principal Investigator	Grupo de Investigacion en Biodiversidad y Conservacion, Universidad de Las Palmas de gran Canaria

Source: FCI assessment team

Summary of Information Obtained

Information obtained and important points raised during discussions:

» Reference pints are interim for all stocks and are uncertain

» There is a need for a harvest control rule

» MSE is underway and should be completed for all stocks

» Levels of bycatch are very low in the freeschool fishery

- There is a high level of compliance among the fleet
- The fleet are committed to ensuring FAD fisheries are sustainable in the long term and are making changes to the type of AFD sued as well as materials used
- All Echebastar vessels are subject to the same internal management controls and measures, notwithstanding requirements by virtue of flag
- It is considered that there are far more GFADs in use in the IO than is officially recorded or reported
- Information in relation to bycatch species and quantities in the freeschool fishery
- Details of management strategies and measures with respect to retained catch, ETP and ecosystem
- Information on the types of information collected from within the fishery
- Details of MCS and surveillance activities on the fleet as well as compliance
- Information in relation to the role and function of the `RFMO as well as the degree of effectiveness and the future direction for management of IO tuna fisheries
- Information in relation to spatial and temporal fishing patterns
- Information in relation to the gear used and the means of deployment/use
- Information in relation to fishing operations (spatial, temporal)
- Information in relation to traceability and catch handling
- Information in relation to handling onboard of bycatch species
- Research that is undertaken within Pesquera Echebastar to improve sustainability and to reduce further the bycatch of the purse seine freeschool fishery
- Details of landings for previous fishing years by set
- Information in relation to the vessels and crews that operate them
- Details of VMS systems in use, logbook reporting requirements
- Information in relation to private fishing agreements that Echebastar negotiate

4.4.3 Evaluation Techniques

Public Consultation

A total of 30 stakeholder individuals and organisations having relevant interest in the assessment were identified and consulted during this assessment. The interest of others not appearing on this list was solicited through the postings on the MSC website, and by advertising in Nation Newspaper (Mahe). These were felt to be the most appropriate media for making these public announcements as Nation Newspaper (Mahe) has significant readership / uptake in the primary stakeholder locations for this fishery and the processes used on the MSC website for tracking and announcing the various stages of the assessment as it progresses - from Full Announcement through to Certification - form an ideal tool through which to channel stakeholder interest and keep them abreast of the important stages of the assessment as a whole.

Initial approaches were made by email and followed up by phone. Issues raised during correspondence were investigated during research and information gathering activities, and during interviews.

Most stakeholders contacted during this exercise either indicated that they had no direct interest in this fishery assessment, or that they had no particular cause for concern with regard to its assessment to the MSC standard.

Process

The MSC is dedicated to promoting “well-managed” and “sustainable” fisheries, and the MSC initiative focuses on identifying such fisheries through means of independent third-party assessments and certification. Once certified, fisheries are awarded the opportunity to utilise an MSC promoted eco-label to gain economic advantages in the marketplace. Through certification and eco-labelling the MSC works to promote and encourage better management of world fisheries, many of which have been suggested to suffer from poor management.

The MSC Principles and Criteria for Sustainable Fisheries form the standard against which the fishery is assessed and are organised in terms of three principles:

» **MSC Principle 1** - Resource Sustainability

» **MSC Principle 2** - Ecosystem Sustainability

» **MSC Principle 3** - Management Systems

A fuller description of the MSC Principles and Criteria and a graphical representation of the assessment tree is presented as **Appendix 1a** to this report.

The MSC Principles and Criteria provide the overall requirements necessary for certification of a sustainably managed fishery. To facilitate assessment of any given fishery against this standard, these Criteria are further split into Sub-criteria. Sub-criteria represent separate areas of important information (e.g. Sub-criterion 1.1.1. requires a sufficient level of information on the target species and stock, 1.1.2 requires information on the effects of the fishery on the stock and so on). These Sub-criteria, therefore, provide a detailed checklist of factors necessary to meet the MSC Criteria in the same way as the Criteria provide the factors necessary to meet each Principle.

Below each Sub-criterion, individual ‘Performance Indicators’ (PIs) are identified. It is at this level that the performance of the fishery is measured. Altogether, assessment of this fishery against the MSC standard is achieved through measurement of 31 Performance Indicators. The Principles and their supporting Criteria, Sub-criteria and Performance Indicators that have been used by the assessment team to assess this fishery are incorporated into the scoring sheets (**Appendix 1.1**).

Scoring of the attributes of this fishery against the MSC Principles and Criteria involves the following process:

» Decision to use the MSC Default Assessment Tree contained within the MSC Certification Requirements (Annex CB)

» Description of the justification as to why a particular score has been given to each sub-criterion

» Allocation of a score (out of 100) to each Performance Indicator

In order to make the assessment process as clear and transparent as possible, the Scoring Guideposts are presented in the scoring table and describe the level of performance necessary to achieve **100** (represents the level of performance for a Performance Indicator that would be expected in a

theoretically 'perfect' fishery), **80** (defines the unconditional pass mark for a Performance Indicator for that type of fishery), and **60** (defines the minimum, conditional pass mark for each Performance Indicator for that type of fishery). The Assessment Tree and Scoring Guideposts for the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery are shown as **Appendix 1.1** to this report.

Scoring outcomes

There are two, coupled, scoring requirements that constitute the Marine Stewardship Council's minimum threshold for a sustainable fishery:

» The fishery must obtain a score of 80 or more for each of the MSC's three Principles, based on the weighted average score for all Criteria and Sub-criteria under each Principle.

» The fishery must obtain a score of 60 or more for each Performance Indicator.

A score below 80 at the Principal level or 60 for any individual Performance Indicator would represent a level of performance that causes the fishery to automatically fail the assessment. A score of 80 orabove for all three Principles results in a pass.

Table 4.4.2 Scoring elements by Principle 2 component

Type	Scoring element	Common name	2.1.1 Main retained (by volume)	Data deficient (Table AC2)	2.1.1 Main retained (SICA)	2.3.1 Endangered Threatened and Protected species PI
Tuna		*Yellowfin tuna*		N	N	*N*
Tuna		*skipjack tuna*		N	N	*N*
Tuna		*bigeye tuna*		N	N	*N*
Tuna		*albacore tuna*	*N*	N	N	*N*
Tuna		*kawakawa*	*N*		N	*N*
Tuna		*frigate tuna/bullet tuna*	*N*		N	*N*
Billfishes	*Makaira indica*	*black marlin*	*N*			*N*
Billfishes	*Makaira nigricans (=mazara)*	*blue marlin*	*N*			*N*
Billfishes	*Istiophorus platypterus*	*Indo-pacific sailfish*	*N*			*N*
Billfishes	*Tetrapturus angustirostris*	*shortbill spearfish*	*N*		*N*	*N*
Billfishes	*Tetrapturus audax*		*N*		*N*	*N*
Billfishes	*Xiphias gladius*		*N*		*N*	*N*
Fishes	*Abudefduf vaigiensis*		*N*		*N*	*N*
Fishes	*Abalistes stellatus*		*N*		*N*	*N*
Fishes	*Aluterus monoceros*		*N*		*N*	*N*
Fishes	*Canthidermis maculatus*		*N*		*N*	*N*
Fishes	*Family Bramidae*		*N*		*N*	*N*
Fishes	*Decapterus macarellus*		*N*		*N*	*N*
Fishes	*Coryphaena hippurus*		*N*		*N*	*N*
Fishes	*Caranx sexfasciatus*		*N*		*N*	*N*
Fishes	*Uraspis secunda*		*N*		*N*	*N*
Fishes	*Diodon hystrix*		*N*		*N*	*N*
Fishes	*Diodon sp.*		*N*		*N*	*N*
Fishes	*Elagatis bipinnulata*		*N*		*N*	*N*
Fishes	*Kyphosus sp.*		*N*		*N*	*N*
Fishes	*Family Molidae*		*N*		*N*	*N*
Fishes	*Kyphosus cinerascens*		*N*		*N*	*N*
Fishes	*Kyphosus vaigiensis*		*N*		*N*	*N*
Fishes	*Lagocephalus lagocephalus*		*N*		*N*	*N*
Fishes	*Lobotes surinamensis*		*N*		*N*	*N*
Fishes	*Masturus lanceolatus*		*N*		*N*	*N*
Fishes	*Mola mola*		*N*		*N*	*N*
Fishes	*Naucrates ductor*		*N*		*N*	*N*
Fishes	*Platax teira*		*N*		*N*	*N*
Fishes	*Remora remora*		*N*		*N*	*N*
Fishes	*Seriola rivoliana*		*N*		*N*	*N*
Fishes	*Sphyraena barracuda*		*N*		*N*	*N*
Fishes	*Cubiceps capensis*		*N*		*N*	*N*
Fishes	*Uraspis uraspis*		*N*		*N*	*N*
Fishes	*Acanthocybium solandri*		*N*		*N*	*N*
Fishes	*Zanclus cornutus*		*N*		*N*	*N*
Sharks	*Carcharhinus falciformis*	*Silky shark*	*N*			*N*
Sharks	*Carcharhinus longimanus*	*Oceanic white tip*	*N*			*N*
Sharks	*Galeocerdo cuvieri*		*N*		*N*	*N*
Sharks	*Prionace glauca*	*Blue shark*	*N*			*N*
Sharks	*Megachasma pelagios*		*N*	N	*N*	
Sharks	*Rhincodon typus*		*N*	N	*N*	
Rays	*Dasyatis violacea*	*Pelagic stingray*	*N*			N
Rays	*Aetobatus narinari*		*N*		*N*	*N*
Rays	*Manta birostris*		*N*	N	*N*	
Rays	*Mobula tarapacana (=coilloti)*		*N*		*N*	*N*
Rays	*Mobula mobular*	*Giant devil ray*	*N*			N
Rays	*Mobula japanica (=rancurelli)*		*N*		*N*	*N*
Turtles	*Eretmochelys imbricata*		*N*	N	*N*	
Turtles	*Lepidochelis olivacea*		*N*	N	*N*	
Cetacea	*Balaenoptera physalus*		*N*	N	*N*	

Source: assessment team

4.4.4 RBF Use

The assessment process notified the possible requirement to utilize the MSC Risk Based Framework (RBF) in order to evaluate the impact of the fishery on one or more Principle 2 components. During the assessment, the team utilized the RBF for evaluating impact of the fishery on scoring elements under the retained species outcome performance indicator (2.1.1).

A range of mainly pelagic elasmobranch and teleost fish species are known to interact with the fishery. Typically, Indian Ocean tuna purse seine freeschool sets may encounter small numbers of a wide range of pelagic species, including oceanic sharks, neritic tunas, rainbow runners, dolphin fishes, trigger

fishes, wahoo, bill fishes, rays, barracudas as well as other fishes, all of which are non-target species that may be retained. Most of these are captured in small numbers and are of little commercial significance. However for many species there is little information in relation to stock status and it is considered that the RBF offers a solution for estimating the overall level of risk for data deficient vulnerable species with which the fishery interacts. During the assessment process, the team carried out a level 1 quantitative risk assessment (SICA) for retained vulnerable species, which were identified as main retained species and therefore qualified as scoring elements under 2.1.1 (retained species outcome status). It was not found to be necessary to implement the RBF for any other performance indicator under Principle 2.

Stakeholder Comments on Use of RBF

None received.

RBF Consultation Process Summary

The intent to use the RBF was announced on the MSC website. No stakeholder comments were received by way of response.

In order to compile a list of species with which the fishery interacts, the assessment team reviewed published observer-sampling data for the EU Indian Ocean tuna purse seine fleet. Data available in relation to freeschool set fishery allowed the team to develop a list of likely species that are taken as bycatch or with which the fishery interacts in freeschool sets (although at very low volumes). The assessment team then reviewed each species in the context of legislation and protection to screen out any ETP species. The team then reviewed the availability of data in relation to stock status for remaining species before finalising a list of data deficient likely non-ETP bycatch species that are retained in the freeschool set purse seine fishery. In order to identify the species most vulnerable to fishery related impacts, the team reviewed biological data, consulted with fishermen during vessel visits, as well as with scientists during the site visits to Seychelles and Spain. Through this consultation, the team finalised a list of data deficient species considered to be most vulnerable to fishery related impacts. These species were considered to be potential 'main retained' species (and therefore a potential scoring element) requiring further evaluation of ecological risk using SICA and/or PSA.

Consultations were held with four separate stakeholders in order to provide input to the SICA.

Summary of Information Obtained

During consultations information in relation to

- risk causing activities associated with tuna purse seining
- the species most often encountered in freeschool sets – unwanted tunas, teleost abundant fish
- frequency/likelihood of encounter for different species/species groups – teleost fish are most frequently encountered such a rainbow runners and other abundant species. Shark and ray bycatch is rare but can and does occur. Often there is successful release of larger specimens
- overall levels of bycatch (exceptionally low, often <1% of the total catch)
- the fate of specimens retained and released
- spatial extent and operation of the fishery – there is low or very low overlap of the freeschool set fishery in the context of the biogeographical range of most vulnerable species
- temporal extent operation of the fishery - the fishery takes place at some level almost every day of the year
- intensity of fishing activity – freeschool sets are made mostly opportunistically in present times and often lead to small or no catches (missed sets). Overall intensity of the freeschool fishery is low was obtained during discussions.

Summary of Activities and Components Discussed / Evaluated

SICA qualitative risk assessments were carried during four separate stakeholder interviews. During the SICA exercise, the most vulnerable scoring element was identified after some brief discussion and consideration of the information assembled by the assessment team. Following on from this, the worst plausible case scenario (i.e. the worst possible outcome in the context of the highest risk causing activity

and the most likely impact on populations) was identified. During the discussion, both silky shark and oceanic white tip shark were identified as being the species most vulnerable to fishing impacts. There was some debate as to which was considered to be more vulnerable, however it was noted that greater numbers of silky sharks are generally encountered.

Process of Choosing Most Vulnerable Scoring Element

The process of identifying the most vulnerable subcomponent involved discussing bycatch with scientists at the SFA, AZTI and the University of Gran Canaria at Las Palmas, discussing bycatch with fishermen and management of Echebastar group. In addition to discussions on bycatch, the team reviewed lists of bycaught species in the fishery, biological and life history information (fishbase, IUCN) and ETP status designations in order to finalise a list of vulnerable species.

The final selection of the most vulnerable scoring element was made during SICA scoring exercises.

5. Traceability

5.1 Eligibility Date

The **Actual Eligibility Date** for this fishery will be the 9th December 2014. This means that any free school tuna (yellowfin, bigeye and skipjack) caught by the certified fleet following that date and providing that separate MSC CoC certification is obtained and in place commencing from the point that fish are landed on the deck of approved vessels, will be eligible to enter the chain of custody as certified product if and when certification is ultimately granted. The rationale for this date is that it meets with the client's wishes, for commercial reasons and corresponds with the date of a separate MSC CoC certification issued to the client Group on 9th December 2014.

5.2 Traceability within the Fishery

5.2.1 Description of Tracking, Tracing and Segregation Systems within the Fishery and Management systems in place relating to Traceability

This is a bulk fishery that yields mainly yellowfin tuna. However, catches may have significant quantities of a range of other tuna species including skipjack, bigeye, albacore and smaller tunas such as frigate and little tunny mixed in with the catch that is taken aboard. Catches are not sorted on the vessel as they are mechanically loaded into large storage tanks filled with super chilled brine. Catches remain in the brine solution within tanks until they are unloaded in port. Accurate recording of the species mix entering each tank is therefore not possible during the fishing operation or while the vessel is at sea. In order to provide accurate breakdowns of catches, sorting and subsampling is conducted at discharge. In this context, catches are sorted by species as they are removed from tanks. Thereafter they are weighed and accurate catch data by stock is generated. Officers from the Seychelles Fishing Authority also subsample catches from all landing events in order to verify the catch breakdown by species component. This is considered an important step in the process of collecting accurate data as it can be difficult to separate mixed catches of small bigeye and yellowfin tuna. SFA officers indicated to the assessment team that it is routine for them to sort and separate bigeye tuna from yellowfin tuna during port state sampling. Estimates of proportions of bigeye and yellowfin tuna arrived at from sub-sampling by SFA are used to finalise catch reporting data. Inspection and subsampling of catches takes place on all vessels discharging into Port Victoria, irrespective of flag. Pesquera Echebastar catch reporting records indicate that catches are indeed separated and are reported by species to national authorities in compliance with EU/Spanish/ and SFA and IOTC requirements.

Catches of yellowfin, skipjack and bigeye tuna are included under the assessment. However in circumstances where either yellowfin tuna or bigeye tuna were no longer certified, the risk of possible inclusion of non-certified catch in certified catches would need to be reviewed in the context of ensuring that appropriate management structures remain in place to ensure uncertified product does not get mixed with certified product.

Traceability up to the point of first landing has been scrutinised as part of this assessment. Overall, the results are positive in terms of the systems that are in place to ensure traceability within Echebastar tuna purse seine operations. These are deemed adequate to ensure fish is caught in a legal manner and is accurately recorded. The report and assessment trees describe these systems in more detail, but briefly traceability can be verified by:

- catch by species and geographical area is estimated during loading and is recorded in terms of the holding tank into which it is placed
- information in relation to the type of set from which the catch is made (associated/FAD/whale/seamount etc.) is recorded for each set
- the tank into which individual catches are loaded is recorded
- no at sea transhipment of catches takes place
- all transhipments takes place in Port Victoria, Seychelles
- all transhipments are witnessed by SFA inspectors

» catches are sorted by species during unloading and reporting of catch quantities is based on final weights for each species from unloading

» there is accurate catch recording and reporting based on use of electronic log books (Spanish and Seychellois)

» there is 100% inspection of landings in the Seychelles by SFA officers. Port state sampling is implemented on all catches in order to verify the breakdown by tuna species

» logbook entries are regularly inspected and cross-checked on completion of in port landings species reporting verification by SFA

» additional Pesquera Echebastar catch logbooks are also maintained and provide a further means of cross checking landed catches

» verified landings data are used for official monitoring of catches and national statistics

» Good cooperation between EU and Spanish regulatory and enforcement authorities and the Seychelles Fishing Authority

» an appropriate level of inspection of landings prior to unloading. Officially calibrated weighing systems of landing. Periodic inspection of the entire unloading process.

» MCS – all Pesqueras Echebastar vessels use VMS and fleet operations are monitored from the FMC in Madrid and within the EEZ of other coastal states within which the fishery may operate.

However, a significant feature of the onboard catch handling system at the time of the site visit is that there are no systems for ensuring that catches from the freeschool fishery are not placed into the same tanks (and therefore mixed) with catches from non-certified fishing activity (such as catches from purse seine sets associated with FAD's and other floating objects, megafauna or seamounts).

In theory it may be possible to verify catch origin by type of set from the mix of tuna present and/or the overall level of bycatch of unwanted species present in holding tanks during unloading, the fact that catches from different types of sets are routinely placed into the same tank means that a the time of the site visit this is not a sufficiently reliable means of validating that a particular unloaded catches is eligible to be certified.

Therefore, it has been concluded that at the time of the site visit overall systems in place for the segregation of certified and non-certified catches do not provide a reliable, practical and verifiably robust means of ensuring that certified and non-certified product is not mixed. This does not support overall traceability in the fishery and undermines the certification, as the current system operated does not ensure full traceability. This presents a significant challenge to the fishery in the context of MSC labelling of freeschool caught tuna as there was at the time of the site visit a high risk of certified product being mixed with uncertified product.

Therefore, free school caught tuna will not therefore be eligible to enter MSC chains of custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels.

Once fish is unloaded at Port Victoria it may enter local tuna processing facilities that are not owned or operated by Pesquera Echebastar or significant quantities (mainly skipjack) may be transhipped directly from Pesqueras Echebastar vessels to reefers for onward transport to processors at other locations around the Indian Ocean.

5.2.2 Evaluation of Risk of Vessels Fishing Outside of UoC

There are no other stocks of yellowfin, skipjack or bigeye tuna in the Indian Ocean, which could be substituted. Pesqueras Echebastar also catch small quantities of albacore tuna and these may be at risk of being mixed in with other species.

5.2.3 Risk of Substitution of Mixing Certified / Non-Certified Catch prior to point of landing

At the time of the site visit there was a high risk of substitution or mixing. The fishery may make sets on both free school tuna and tuna that is associated with FADs, floating objects, seamounts, megafauna (including whalesharks and whales) during the same fishing expedition. Much of the activity is opportunistic and it is not possible to distinguish catches using current systems on-board as catches are placed into tanks where fish from more than one set will be present. It is not possible to verify the catch origin (fishing method) of all fish discharged from on-board tanks.

Accordingly it is considered that at the time of the site visit there is a high likelihood of mixing of certified and non-certified product on-board prior to discharge of catches. Free school caught tuna will not therefore be eligible to enter MSC chains of custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels.

5.2.4 At-Sea Processing

There is no at sea processing and vessels are not equipped to undertake any processing. Practically all tuna is landed round frozen. All skipjack is landed round. Small amounts of sashimi grade yellowfin, skipjack and bigeye tuna be landed gutted, bled and head off.

5.2.5 Trans-Shipment

Transhipment mostly of (skipjack tuna) takes place in Port Victoria. During transhipment, unloading/loading is witnessed and supervised by SFA inspectors. Transhipment takes place directly from purse seine vessel to reefers, from where fish is transported to Mauritius. All transhipped loads are verifiable by species and quantity and no transhipment takes place at sea or without the presence of SFA inspectors.

5.2.6 Robustness of management systems relating to traceability

Overall management of Pesqueras Echebastar is considered to be detailed, robust and ensures traceability of catches to vessel, geographic location, stock and capture date. Traceability is also tested and verified through the operation of in port inspection and sampling protocols by SFA, as well as by the procedures and monitoring by the Spanish Fisheries Secretariat. While fishing in third party nation EEZ's, Echebastar vessels may be subjected to further management measures by coastal states and these may contribute to and further enhance overall traceability. It is tuna processing industry standard to require full traceability of catches and customers of Pesqueras Echebastar require suppliers to have full traceability in place in order to satisfy legal obligations as well as supplier purchasing protocols. In this regard overall systems are considered to be comprehensive, robust and have been tested up to point of landing.

Despite this, traceability systems do not at the time of the site visit support the segregation of catches by type of purse seine set. The purse seine vessels utilise different fishing strategies when fishing for tunas. The majority of catches of Echebastar group vessels in recent years emanate from purse seine sets made in association with FADs and other drifting objects, whereas the Units of Certification included under the present assessment report all relate to purse seine sets made only on free schools of tuna. Free schools are considered to be those made on schools of tuna, the presence of which is indicated by sea surface bird activity or by the presence of baitfish in the water. Free school sets are truly unassociated sets, meaning that they take place at some distance from any FAD or other floating object or megafauna. Associated sets are generally considered to be those that take place at a distance of 5 nm or less from a FAD.

Accordingly, the assessment has found that at the time of the site visit traceability with respect to the type of set with which discharged catches are associated cannot be verified and management is considered insufficient in this regard. While on-board procedures do require the recording of information in relation to purse seine sets (including whether freeschool, FAD, whale etc.), on-board procedures with regard to traceability do not ensure that freeschool catches are held separately and are not mixed

with catches from non-freeschool sets. Overall this does not support the certification of any landed product.

As mentioned in previous sections free school caught tuna will not therefore be eligible to enter MSC chains of custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels.

5.3 Eligibility to Enter Further Chains of Custody

Only Yellowfin tuna, skipjack tuna and Bigeye tuna caught in the manner defined in the Units of Certification (**Section 3.1**) and which have full traceability shall be eligible to enter the Chain of Custody. Currently traceability does not support the certification of any landed catches or the entry into further Chains of Custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels.

Chain of Custody should commence following the point of fish landing on the deck of approved vessels, at which point the product shall be eligible to carry the MSC logo (under restrictions imposed by the MSC Chain of Custody standard). With adequate traceability in place, there are no restrictions on the fully certified product entering further chains of custody.

5.3.1 Eligible points of landing

The only eligible point of landing in the Seychelles is Port Victoria. Other points of landing (e.g. Mombasa, Kenya) may be considered for future inclusion under the assessment, subject to a review of landings controls and inspection procedures and confirmation that these are sufficient to guarantee traceability.

5.3.2 Parties eligible to use the fishery certificate

Vessels of Pesquera Echebastar, including those vessels of Hartswater International are eligible to use the fishery certificate. There are no other eligible fishers and no certificate sharing mechanism exists.

5.4 Eligibility of Inseparable or Practically Inseparable (IPI) stock(s) to Enter Further Chains of Custody

Catches of bigeye, skipjack and yellowfin tuna are separated on landing. However, small bigeye tuna can be difficult to separate from small yellowfin tuna. Because of this, at every landing event inspectors from the Seychelles Fishing Authority carry out catch sampling in order to verify the proportions of bigeye and yellowfin tuna that may be present in landings of smaller sized non-skipjack tunas. While small bigeye tuna may be present in and reported in yellowfin catches to varying degrees, subsampling of catches means that estimates of the volume of each stock present in discharged catches can be made.

There are no IPI stocks included in the certification and the IPI methodology of the CR (Annex CH) has not been applied. From a traceability perspective, it is possible to trace product by stock origin and mixed landings of yellowfin and bigeye tuna are therefore eligible to enter onward chain of custody.

6. Evaluation Results

6.1 Principle Level Scores

Table 6.1: Final Principle Scores

Principle	Yellowfin tuna UoC	Skipjack tuna UoC	Bigeye tuna UoC
Principle 1 – Target Species	82.5	81.9	81.3
Principle 2 - Ecosystem	85.0	85.0	85.0
Principle 3 – Management System	80.5	80.5	80.5

Source: FCI assessment team

6.2 Summary of Scores

Individual scores for each stock evaluated by performance indicator are presented in Table 6.2.

Table 6.2: Final scores by performance indicator

PI No.	Performance Indicator (PI)	YFT	SKJ	BET
1.1.1	Stock status	100	100	100
1.1.2	Reference points	75	75	75
1.1.3	Stock rebuilding	NA	NA	NA
1.2.1	Harvest strategy	80	80	80
1.2.2	Harvest control rules & tools	60	60	60
1.2.3	Information & monitoring	80	80	80
1.2.4	Assessment of stock status	90	85	80
2.1.1	Outcome	80	80	80
2.1.2	Management	80	80	80
2.1.3	Information	75	75	75
2.2.1	Outcome	100	100	100
2.2.2	Management	90	90	90
2.2.3	Information	80	80	80
2.3.1	Outcome	85	85	85
2.3.2	Management	85	85	85
2.3.3	Information	75	75	75
2.4.1	Outcome	100	100	100
2.4.2	Management	100	100	100
2.4.3	Information	85	85	85
2.5.1	Outcome	80	80	80
2.5.2	Management	80	80	80
2.5.3	Information	80	80	80
3.1.1	Legal & customary framework	80	80	80
3.1.2	Consultation, roles & responsibilities	80	80	80
3.1.3	Long term objectives	85	85	85
3.1.4	Incentives for sustainable fishing	75	75	75
3.2.1	Fishery specific objectives	70	70	70
3.2.2	Decision making processes	85	85	85
3.2.3	Compliance & enforcement	80	80	80
3.2.4	Research plan	90	90	90
3.2.5	Management performance evaluation	80	80	80

Source: FCI assessment team

6.3 Summary of Conditions

Table 6.3: Summary of Conditions

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/ N/A)
1	REFERENCE POINTS	YFT 1.1.2	N
2	HARVEST CONTROL RULE AND TOOLS	YFT 1.2.2	N
3	REFERENCE POINTS	SKJ 1.1.2	N
4	HARVEST CONTROL RULE AND TOOLS	SKJ 1.2.2	N
5	REFERENCE POINTS	BET 1.1.2	N
6	HARVEST CONTROL RULE AND TOOLS	BET 1.2.2	N
7	RETAINED SPECIES INFORMATION	2.1.3	N
8	ETP SPECIES INFORMATION	2.3.3	N
9	INCENTIVES AND SUBSIDIES	3.1.4	N
10	FISHERY SPECIFIC OBJECTIVES	3.2.1	N

Source: FCI assessment team

6.3.1 Outcomes of RBF use and stakeholder discussions

The SICA exercise was carried out with a number of stakeholders with whom the assessment team met or had discussions by conference. Outcomes from the process assisted in identifying scoring elements and the main risk causing activity. The main risk causing activity was direct and indirect (delayed) mortality of vulnerable species through interactions with the purse seine gear and vessel during the fishing operations. Table CC2 was completed in respect of scoring elements.

The worst plausible case scenario identified was significant disruption to normal population dynamics leading to long-term population decline. The mechanism suggested was capture related observed and unobserved mortality. The most vulnerable subcomponent was identified as reproductive capacity. The consequences were considered to possibly lead to detectable changes to reproductive capacity of shark species (silky shark) through capture related mortality of adults, but minimal impact on population dynamics. The consequence category for this is 2. Using Table CC14 this converts to an MSC equivalent score for silky shark scoring element of 80. 80 is considered to be the minimum acceptable unconditional score, and when combined with other scoring elements at 2.1.1 for all UoC's leads to an overall score of 80 for 2.1.1

6.3.2 Recommendations

There is one recommendation for this fishery. Please see details below:

Recommendation 1

Some evidence was available that indicated Echebastar may operate board procedures that are intended to ensure unwanted catch of retained tuna and other species is minimised and that large captured specimens such as sharks, mantas and turtles are removed from the purse seine or brailer at the earliest opportunity. Despite all of the above, the team did identify a number of weaknesses in the management of retained bycatch in this fishery. While overall these weaknesses did not cause the fishery to score below 80 in either outcome or management performance indicators for the retained species component, the assessment team was of the opinion that management of bycatch could justifiably be further reinforced in the context of the partial strategy and measures that are already in place. Therefore a recommendation is been made that suggests greater levels of training among fishing crews should be undertaken. Training should extend beyond fishing skippers to include all deck and fishing crews. It should be undertaken at regular intervals and training records should be kept. That bycatch management training has been undertaken by all relevant crew should also be verifiable.

The assessment team also found that clear, detailed written strategies for bycatch management at operational level were lacking. Clear documented strategies that include:

» detailed onboard procedures and techniques for minimizing overall levels of bycatch

» detailed procedures for ensuring the careful handling and prompt release (using appropriate techniques) of captured specimens of shark and ray and

» details of key functions and responsible personnel in relation to implementation of the overall strategy and individual measures need to be developed and should be available for reference onboard in all the working languages of the crews and the recommendation extends to include this also.

6.4 Determination, Formal Conclusion and Agreement

The three 'Free School' UoCs defined within this report attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any MSC Criteria.

It is therefore determined that the three 'Free School' UoCs within the **Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery** defined within this report **should be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries**.

Following this decision by the assessment team, and review by stakeholders and peer-reviewers, the determination has been presented to FCI's decision-making entity that the three Free School UoCs within this fishery and defined within this report have passed its assessment and should be certified.

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Appendix 1. Scoring & Rationale

Appendix 1a – MSC Principles & Criteria

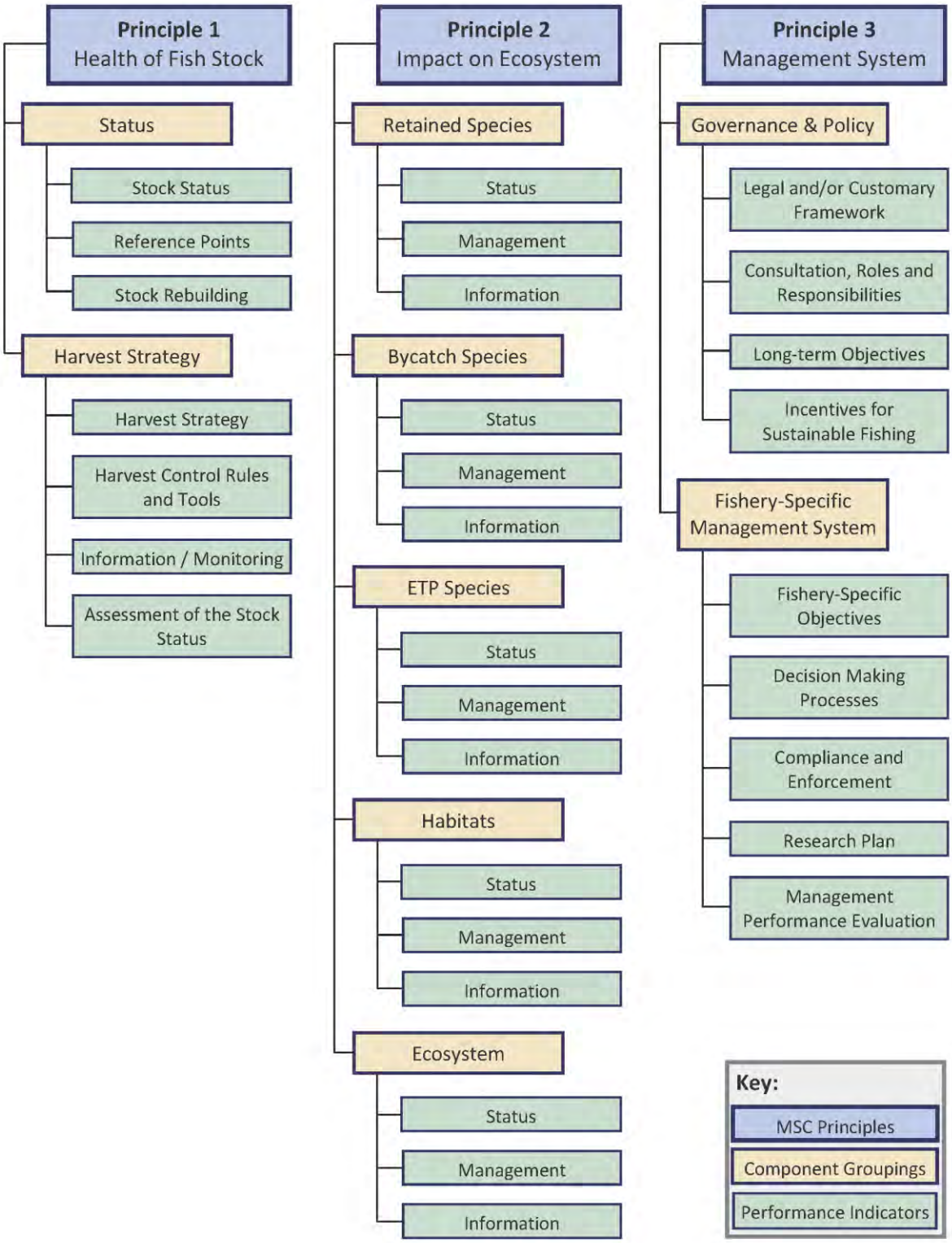


Figure A1 – Graphic of MSC Principles and Criteria

Below is a much-simplified summary of the MSC Principles and Criteria, to be used for over-view purposes only. For a fuller description, including scoring guideposts under each Performance Indicator, reference should be made to the full assessment tree, complete with scores and justification, contained in **Appendix 1.1** of this report. Alternately a fuller description of the MSC Principles and Criteria can be obtained from the MSC website (www.msc.org).

Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Intent:

The intent of this Principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short-term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Status

» The stock is at a level that maintains high productivity and has a low probability of recruitment overfishing.

» Limit and target reference points are appropriate for the stock (or some measure or surrogate with similar intent or outcome).

» Where the stock is depleted, there is evidence of stock rebuilding and rebuilding strategies are in place with reasonable expectation that they will succeed.

Harvest strategy / management

» There is a robust and precautionary harvest strategy in place, which is responsive to the state of the stock and is designed to achieve stock management objectives.

» There are well defined and effective harvest control rules in place that endeavour to maintain stocks at target levels.

» Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.

» The stock assessment is appropriate for the stock and for the harvest control rule, takes into account uncertainty, and is evaluating stock status relative to reference points.

Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends

Intent:

The intent of this Principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Retained species / Bycatch / ETP species

» Main species are highly likely to be within biologically based limits or if outside the limits there is a full strategy of demonstrably effective management measures.

» There is a strategy in place for managing these species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.

» Information is sufficient to quantitatively estimate outcome status and support a full strategy to manage main retained / bycatch and ETP species.

Habitat & Ecosystem

» The fishery does not cause serious or irreversible harm to habitat or ecosystem structure and function, considered on a regional or bioregional basis.

» There is a strategy and measures in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.

» The nature, distribution and vulnerability of all main habitat types and ecosystem functions in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery and there is reliable information on the spatial extent, timing and location of use of the fishing gear.

Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

Governance and policy

» The management system exists within an appropriate and effective legal and/or customary framework that is capable of delivering sustainable fisheries and observes the legal & customary rights of people and incorporates an appropriate dispute resolution framework.

» Functions, roles and responsibilities of organisations and individuals involved in the management process are explicitly defined and well understood. The management system includes consultation processes.

» The management policy has clear long-term objectives, incorporates the precautionary approach and does not operate with subsidies that contribute to unsustainable fishing.

Fishery specific management system

» Short and long term objectives are explicit within the fishery's management system.

» Decision-making processes respond to relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner.

» A monitoring, control and surveillance system has been implemented. Sanctions to deal with non-compliance exist and there is no evidence of systematic non- compliance.

» A research plan provides the management system with reliable and timely information and results are disseminated to all interested parties in a timely fashion.

Appendix 1.1 Performance Indicator Scores and Rationale

Evaluation table for P 1.1.1 SKJ

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	Guidepost	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Yes	Yes	Yes
	Justification	Concerning the target stock level, and noting that while BMSY, B2010, and B0 are unknown, both SB2011/SB1950 (=SB0) = 0.45 [0.25 – 0.665] and SB2011/SBMSY = 1.2 [1.01– 1.43] have been determined. Based on these values the best estimate of SBMSY/SB0 is 0.375 Resolution 13/10 provides that BLIM = 0.40 BMSY implying an SBLIM/SB0 of 0.15. Noting CB2.3.3.4, a value of 0.20 might be more prudent. However, even against this more conservative (but consistent with CB2.3.3.4) standard the base case median estimate of SB relative to its unfished state is 0.45 [0.25 - 0.65], where even the lower 95% confidence bound is well above the default value of 0. 20. Therefore, taking account of the uncertainty associated with the base case status estimates, there is a high degree of certainty (i.e. greater than 95%, as set out in MSC CR CB2.2.1.3) that the stock is above the point where recruitment would be impaired – the default value for this being around 50% of the BMSY level. This meets SG100.		
B	Guidepost		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Yes	Yes
	Justification	The current estimate of SB2012/SBMSY is 1.2 [1.01– 1.43]. Based on the SS3 assessment, there is a low risk of exceeding MSY-based reference points in the next 10 years if catches are maintained at 2009 (19 % risk that SB202 < SBMSY and 31% risk that C2020>MSY). Hence there is a “high degree of certainty” that the stock has been above the MSY reference points in recent years. Thus, this meets SG100.		
References				
Stock Status relative to Reference Points				
		Type of reference point	Value of reference point	Current stock status relative to reference point

TRP	Analytically derived SBmsy	38%B0	1.20 (1.01– 1.43)
LRP	MSC default (CB2.3.3.4)	20%B0	1.2*(0.38/.20) = 2.25
OVERALL PERFORMANCE INDICATOR SCORE			**100**

Evaluation table for P 1.1.2 SKJ

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Yes	Yes	
	Justification	In resolution 13/10 the IOTC adopted interim target (BMSY and FMSY) and limit (BLIM = 0.40 BMSY and FLIM = 1.50 FMSY) reference points for skipjack tuna. The resolution specifies that the IOTC Scientific Committee should assess stocks against these reference points and provide advice against them, as is done both in tabular form and using Kobe process presentations. The resolution also calls on the Scientific Committee to further investigate reference points and Harvest Control Rules (HCR) using Management Strategy Evaluation (MSE). Stock assessments for skipjack are well advanced (see IOTC–2012–WPTT14) and though results are uncertain the influence of alternative assumptions and model approaches is explored. The target reference points for this stock have been set as ratios: B/BMSY and F/FMSY. This is reasonable and consistent with practice elsewhere as well as with MSC requirements. The reference points are estimated based on MSY and are appropriate for tuna stocks. MSY is estimated within the stock assessment and reported to the management system. The relation of the stock relative to MSY is reported as part of the determination of stock status: the SG80 is met.		
B	Guidepost		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		No	No

	Justification	Resolution 13/10 sets interim target (BMSY and FMSY) and limit (BLIM = 0.40 BMSY and FLIM = 1.50 FMSY) reference points for bigeye tuna. No rationale is available to support these choices. Concerning the target stock level, and noting that while for big eye tuna neither BMSY, B2011, nor B1950 (=B0) are unknown, both SB2011/SB1950 (=SB0) = 0.45 [0.25 – 0.665] and SB2011/SBMSY = 1.2 [1.01– 1.43] have been determined. Based on these values the best estimate of SBMSY/SB0 is 0.375 Resolution 13/10 provides that BLIM = 0.40 BMSY implying an SBLIM/SB0 of 0.15. Noting CB2.3.3.4, a value of 0.20 might be more prudent. Although the IOTC has yet to adopt a specific limit reference point, management advice is provided relative to MSY as a target. The default 50% BMSY is assumed here for purposes of defining stock status. However, the lack of a well-defined point indicates that the SG80 is not met.		
C	Guidepost		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Yes	No
	Justification	The implied Blim of 15%B0 is below the default certification requirement of 20% B0. There is, however, no indication of impaired recruitment to date. The reference points in use are interim and work is planned to refine them using MSE to evaluate reference points and HCR. Clearly the intention of the IOTC (management response) and the basis on which scientific advice is supplied is to maintain the stock at or above the MSY level. Therefore, although an interim target reference point is defined at a level consistent with BMSY – thus meeting SG80 - a more precise definition justified through scientific analysis and research would be necessary before the higher guidepost could be met. . In addition there remain issues of uncertainty (see section 3.3.4.4) particularly in respect of errors in the estimation of the stock status, and (ii) the estimation of MSY itself. These are specifically addressed by IOTC resolution 14/07 which seeks to standardise the presentation of scientific information in the annual scientific committee report and in working party reports. In addition HCRs are being developed that will incorporate such uncertainty.		
D	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		Not Applicable	

	Justification	Not Applicable
References		
OVERALL PERFORMANCE INDICATOR SCORE		**75**
CONDITION NUMBER		**3**

Evaluation table for P 1.1.3 SKJ

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?			
	Justification	This is not depleted and this PI is not taken into consideration.		
B	Guidepost	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted 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 depleted stock.
	Met?			
	Justification			

C	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?			
	Justification			
References				
OVERALL PERFORMANCE INDICATOR SCORE:				**NA**

Evaluation table for P 1.2.1 SKJ				
PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Yes	Yes	No
	Justification	Scientific advice has been formulated relative to a harvest strategy which is, in turn, relative to MSY reference points. This is responsive to that state of the stock and to limit and target reference points commonly used for bigeye and other tropical tunas, meeting the SG80. However, because the strategy is not clearly defined but, rather is “implied.” and it is unclear whether the harvest strategy will be successful. Therefore, the designed aspect of the strategy to change overall selectivity cannot be given full credit, preventing meeting the SG100.		
B	Guidepost	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
	Justification	It is clear from the report of the WPTT that while the harvest strategy may not have been fully tested, none the less, monitoring is in place. Further It is evident from the most recent assessment that for this stock a) the catch is below MSY, b) the stock is not overfished. This indicates that overall controls on the exploitation of this stock has been adequate to date and the harvest strategy is achieving its objectives. This meets the SG80. That being said, and in the absence of direct evidence or the results of a full MSE, there is not specific evidence that the harvest strategy will work in practice under different circumstances. That is, it has not be full evaluated and there is no specific evidence exists to show that it is achieving its objectives (including being clearly able to maintain stocks at target levels). Further there is no pre-agreement on how to react to stock changes and stock assessments required to evaluate management performance are not frequent - given the stock is heavily exploited. It has yet to be shown that the management system can maintain stock at the target level (B>BMSY, F<FMSY), so the SG100 is not met.		

C	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Yes		
	Justification	The work of the WPTT provides clear evidence that monitoring of this stock is adequate to determine whether the harvest strategy is working. The different parts of the strategy include maintaining both B/BMSY and F/FMSY. Data are collected to estimate these quantities and updates and assessments conducted. The latter reports best estimates of biomass, which indicates whether management is achieving its objectives or not. That being said there is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible. Therefore the fishery meets the SG60.		
D	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			No
	Justification	There is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible. Therefore, the fishery does not meet the SG100.		
E	Guidepost	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?			
	Justification	Not relevant.		
References		» IOTC RES 12/01, IOTC RES 13/10, IOTC-SC15-R[E], IOTC-WPTT14-R[E]		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**

Evaluation table for P 1.2.2 SKJ				
PI 1.2.2		There are well defined and effective harvest control rules in place Note: SG60 SIs are from MSC CR 2.0		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	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 harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Yes	No	
	Justification	Following the MSC Notice, "Scoring of 'available' Harvest Control Rules (HCRs) in CRv1.3 fisheries" of 24th November, PI 1.2.2 SIa and c (below) are scored using CR v2.0 provisions for SG60 scoring. The notice provides for scoring using CR v2.0 at 1.2.2a and c but is aimed at avoiding 'incorrect interpretation' at CR v1.3 PI 1.2.2c. It is also aimed at ensuring consistency between assessments which are being harmonized (as is this assessment). CR v2.0 scoring guidance is provided at SA2.5.2 which includes conditions for use of CR v2.0 when generally understood HCR are considered to be available but not actually in place. The basis for SG60 scoring at PI 1.2.2a is that generally understood HCR are in place – through adoption specifically of IOTC Res 13/10. Conditions for use of CR v2.0 laid out at SA2.5.2 are therefore not relevant. At CR v2.0 GSA2.5 it is clear for SG60 scoring that "HCRs should be likely to ensure that stocks will be maintained above the PRI". At PI 1.1.2 SIb (above) it is noted the IOTC has implicitly adopted an interim LRP of 14.6% B0 but without justification. For the purposes of this assessment, and consistent with comments at PI 1.1.2 SIb, the PRI is assumed to be 20% Bo, consistent with MSC CR v1.3 CB2.3.3.4 and MSC CR v2.0 GSA2.2.3. Resolution IOTC RES 13/10 specifies interim MSY-related TRP and LRP and an interim framework for management based on status relative to the TRP. The framework is illustrated in Figure 3 of this assessment report and is used in SC advice to the Commission (e.g. IOTC-2013-SC16-R[E]). The resolution does not explicitly define overfishing but implicitly defines it as F/Fmsy > 1, consistent with Bmsy and well above 20%B0. At paragraph 4, the interim framework provides guidance on management aims depending on where the stock is estimated to be in quadrants of the Kobe Plot defined by F/Fmsy and B/Bmsy, and requiring certain outcomes with high probability depending on status relative to those reference points. Specifically, noting the Kobe Plot quadrants referred to are defined by the F and SB target reference points: HCRs will take account of the following objectives: a) For stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant; b) For stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible; c) For stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible; d) For stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible. No limit reference points are used in defining actions but the framework seeks to ensure with high probability that stocks below the Bmsy target reference points are rebuilt "in		

		as short a period as possible" and if required that overfishing is ended with a high probability. As specified, regardless of the SB limit reference point definition, exploitation rate should be reduced well before the PRI, taken as the MSC default of 20% Bo, might be approached. CR v2.0 allows for TRP-based HCR (with implied LRP) at GSA2.5 (boxed example on p 174 of Fisheries Standard v2.0). Paragraph 4 of IOTC Res 13/10 is explicit that "the SC shall develop and assess potential harvest control rules (HCRs) to be applied, considering the status of the stocks against the reference points assessed in paragraph 3 for albacore, bigeye tuna, skipjack tuna, yellowfin tuna and swordfish. Based on the results of the MSE and considering the guidelines set forth in the UNFSA and in Article V of the IOTC Agreement, the IOTC Scientific Committee will recommend to the Commission HCRs for these tuna and tuna-like species…" At paragraph 2, IOTC RES 13/10 requires that the IOTC Scientific Committee should endeavour to apply the interim framework in the provision of recommendations for management measures. The interim framework lays out general management aims without specifying exact actions, defining what constitutes "high probability", or specifying required rebuild periods. CR v2.0 GSA2.5, says that "HCRs should be regarded as only 'generally understood' as required to achieve a 60 score in cases where they can be shown to have been applied in some way in the past, but have not been explicitly defined or agreed." The IOTC HCR for skipjack have been defined by IOTC Res 13/10 and have been agreed and put in place (adopted); more importantly, IOTC Res 13/10 lays out in general terms a familiar HCR framework used in multiple jurisdictions for many stock/fishery types. The IOTC and other tuna RFMOs are progressing HCR development through the Working Party on Tropical Tunas (WPPT) using Management Strategy Evaluation (MSE). The IOTC has provided clear guidance to the SC for developing what HCR must achieve at IOTC RES 13/10 Para 4. We conclude that there are, therefore, generally understood HCRs in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached, meeting SG 60 scoring requirements. HCRs are not well defined, as required for SG80 scoring. t		
B	Guidepost		The **selection** of the harvest control rules takes into account the **main** uncertainties.	The **design** of the harvest control rules takes into account a **wide** range of uncertainties.
	Met?		No	No
	Justification	The interim, general framework provides guidance on management only in relation to point (median) estimates of F/Fmsy and B/Bmsy, as well as through un-weighted, multi-model forecasts relative to the reference points (Kobe II Strategy Matrix). The point estimates are derived from only the base case assessment run so no consideration is taken of the wider set of sensitivity assessment runs. The forecasts do not fully account for model uncertainty. The HCR cannot be said to take account of the main uncertainties. The fishery does not meet SG80 & 100 SI(b).		
C	Guidepost	There is some evidence that tools used to implement harvest control rules 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 harvest control rules.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.

	Met?	Yes	No	No
	Justification	Following the MSC Notice, "Scoring of 'available' Harvest Control Rules (HCRs) in CRv1.3 fisheries" of 24th November, PI 1.2.2 SIa (above) and c are scored using CR v2.0 provisions for SG60 scoring. The notice provides for scoring using CR v2.0 at 1.2.2a and c but is aimed at avoiding 'incorrect interpretation' at CR v1.3 PI 1.2.2c. It is also aimed at ensuring consistency between assessments which are being harmonized (as is this assessment). CR v2.0 SA2.5.6 requires that as part of the evidence that tools are working, teams should include current levels of exploitation in the UoA, as measured by fishing mortality rate where available. Evidence from the 2014 stock status determination (IOTC-2014-SC17-R[E]) is that the exploitation rate (C2013/Cmsy) was 0.62 (0.49-0.75) and in the base case assessment had never exceeded Fmsy. CR v2.0. GSA2.5.2-5 (at p176 of Fisheries Standard v2.0) as relates to SA2.5.6 notes that current F being "equal to or less than Fmsy should usually be taken as evidence that the HCR is effective." The continuing text does not elaborate on the meaning of 'usually' but concerns only cases where F is greater than Fmsy. The most recent up-date of the skipjack stock assessment (November 2014, IOTC-2014-SC17-R[E]) found that "on the weight-of-evidence available in 2014, the skipjack tuna stock is determined to be not overfished and is not subject to overfishing." We therefore conclude that F is currently below Fmsy. GSA2.5.2-5 guidance states that this should usually be interpreted as HCR's being effective, and thus supports SG60 scoring using MSC CR 2.0.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				**60**
CONDITION NUMBER:				**4**

Evaluation table for PI 1.2.3 SKJ				
PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information),

				including some that may not be directly related to the current harvest strategy, is available.
	Met?	Yes	Yes	No
	Justification	Skipjack data in the Indian Ocean are comprehensive, informative and relevant. These data consider (a) stock structure, (c) fleet composition (d) stock abundance (mainly standardised CPUE series) (e) fishery removals, and (f) other data and provide information on the spatial distribution of catches, their size frequencies, results of tagging studies as well as growth and mortality models. The data are adequate to allow appropriate stock assessments and to evaluate the status of the stock against target and limit reference points. In addition environmental data are used in CPUE standardization and to help explain recruitment. Stock structure data while limited are consistent with an Indian Ocean-wide stock. Overall, data are adequate for stock assessment and for an appropriate harvest control rule, and thus meet the SG80. However, despite the best efforts of the IOTC secretariat it remains the case that i) issues remain with some of these data and ii) there are information gaps such that it cannot be concluded that this information constitutes a comprehensive range of information. Consequently the data do not presently allow the implied harvest control rule to be applied with a high degree of certainty, so the SG100 is not met.		
b	Guidepost	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery 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

	Justification	IOTC has put considerable effort into the reporting and recording of catches by the contracting parties. These are summarised in the following resolutions: » 13/03 On the recording of catch and effort data by fishing vessels in the IOTC area of competence » 11/04 On a regional observer scheme » 10/02 Mandatory statistical requirements for IOTC Members & Cooperating Non-Contracting Parties » 10/08 Concerning a record of active vessels fishing for tunas and swordfish in the IOTC area » 10/09 Concerning the functions of the Compliance Committee » 06/03 On establishing a vessel monitoring system programme » 03/03 Concerning the amendment of the forms of the IOTC statistical documents The IOTC secretariat puts considerable effort into considering any issues identified relating to the statistics of tropical tunas. This list covers the main issues which the Secretariat considers affect the quality of the statistics available at the IOTC, by type of dataset and type of fishery. Specifically it includes issues relating to non-reporting of fishery removals and attempts to rectify or estimate these. Standardized CPUE indices are available from several fleets. Tagging data is also available. Together these are considered are adequate for the harvest strategy. While indicators of stock abundance - mainly standardised catch-per-unit-effort indices – are available, a single index covering the entire time series is not available. While data are sufficient to meet SG80 they do not presently allow the implied harvest control rule to be used with great confidence, preventing the SG100 being met.		
c	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Yes	

	Justification	CB 2.7.1 requires the identification of which information from the information categories in CB2.7.1.1 is relevant to the design and effective operational phases of the harvest strategy, Harvest Control Rules and tools, and that evaluation should be based on this information. In terms of the harvest strategy and its component parts, the most important data are fishery removals as inputs to the stock assessment used to determine stock status relative to MSY-related reference points. GCB 2.7.2 clarifies that the reference to 'other' fishery removals in scoring issue c relates to vessels outside or not covered by the unit of certification. These require good information but not necessarily to the same level of accuracy or coverage as that covered by the second scoring issue. In fact, as the harvest strategy works at Indian Ocean and IOTC level, not at the level of the unit of certification, "other removals" in this instance are effectively subsumed in to consideration of fishery removals at PI 1.2.3b and, consistent with that, it is clear that there is good information on all other fishery removals from the stock, consistent with SG80 scoring criteria. IOTC Resolution 13/03 requires that all purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres length overall and those under 24 metres if they fish outside the EEZs of their flag States within the IOTC area of competence to keep a bound paper or electronic logbook and to record, inter alia, the weight (kg) or number by species per set/shot/fishing event for each of a comprehensive list of species. For purse seine, this includes IOTC species, marine turtles, marine mammals, sharks, rays and other bony fish. It is apparent that IOTC has put considerable effort into the recording and reporting of catches and that the current level of reporting is adequate given the large number of small countries involved and the difficult task of monitoring small vessels often far away or on the high seas. Overall, data are sufficient to meet the SG80.
References		
OVERALL PERFORMANCE INDICATOR SCORE		**80**

Evaluation table for PI 1.2.4 SKJ

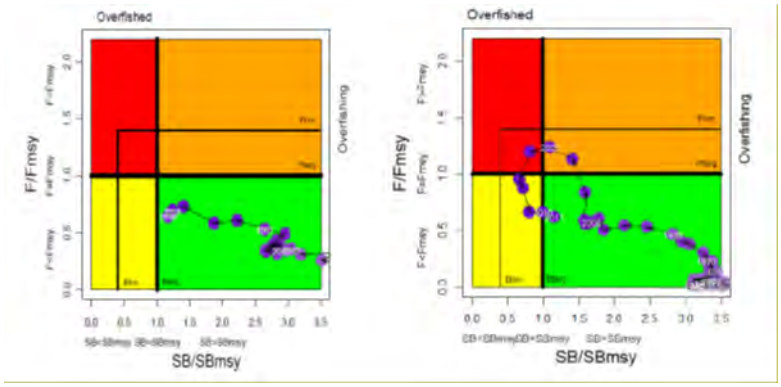
PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Yes	No
	Justification	A single quantitative modelling method (SS3) was applied to this with management advice based on the range of results from the model. The SS3 assessment model is age-structured, iterated on a quarterly time-step, spatially aggregated, with four fishing fleets and Beverton-Holt recruitment dynamics. Model parameters (virgin recruitment, selectivity by fleet, recruitment deviations, and M in some cases) were estimated by fitting predictions and observations of CPUE, length frequency data for all fleets, and tag recoveries (for the purse seine fleets, and in some cases, the Maldivian P&L fleet). The stock status was reported relative to reference points. » The 2011 assessment was the initial comprehensive assessment effort. While the results are very useful, there are unresolved uncertainties in basic productivity exemplified by the lack of good estimates of fishing mortality. » Based on the stock assessment carried out in 2012, the stock was considered to be not overfished and not subject to overfishing (Table 1). [IOTC–2013–WPTT15–R[E] » No new stock assessment was carried out for skipjack tuna in 2013. » Spawning stock biomass is estimated to have declined by approximately 45 % in 2011 from unfished levels. Total catch has continued to decline with 314,537 tonnes landed in 2012, in comparison to 384,537 tonnes in 2011. » The recent declines in catches from this stock are thought to be caused by a recent decrease in purse seine effort as well as a decline in CPUE of large skipjack tuna in the surface fisheries. There remains considerable uncertainty in the assessment, and the range of runs analysed illustrate a range of stock status to be between 0.73–4.31 of SB2011/SBMSY based on all runs examined. The assessment approach is appropriate for the stock and for the current implied harvest control rule, meeting the SG80, but it is as yet unclear whether this model accounts adequately for the features of this fishery, so it does not meet the SG100.		

b	Guidepost	The assessment estimates stock status relative to reference points.		
	Met?	Yes		
	Justification	The assessment estimate stock status relative to reference points and SB2011/SBMSY (rather than B2011/BMSY) and F2011/FMSY are presented as point estimates with 95% confidence intervals, meeting the SG60.		
c	Guidepost	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
	Justification	The stock assessment methods used in the analysis of this stock report uncertainty in estimates of stock status. These uncertainties have also been examined as alternative model structures. Similarly the stock status associated with these alternatives have been evaluated in a probabilistic manner. While these weightings are not statistical rigorous they represent a consensus of experts on relative importance and have been carried through Kobe plots a strategy matrix. A decision table is provided to help assess risk. The use of probability in the management advice allows risk to be taken into account in the decision making, meeting the SG100.		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			No
	Justification	While a range of quantitative modelling methods (ASAP, ASPM and SS3) were applied to bigeye tuna in 2013 – constituting a degree of testing – there has not been a systematic testing of the assessment. Nor have alternative hypotheses and assessment approaches have been rigorously explored, preventing the SG100 being met.		
e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Yes	No

		The stock assessment of bigeye is primarily reviewed through the Working Party for Tropical Tunas of the IOTC's Scientific Committee. Additionally, outside experts are invited to participate in the Working Party meetings. Thus whereas there is clearly a degree of peer review that meets SG80 it is not clearly apparent that this review was externally reviewed and, on that basis, cannot be said to have met SG100
References		
OVERALL PERFORMANCE INDICATOR SCORE		**85**

Evaluation Table for PI 1.1.1 YFT

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	Guidepost	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Yes	Yes	Yes
	Justification	Concerning the target stock level, and noting that while BMSY, B2010, and B0 are unknown, both SB2010/SB0 = 0.38 [0.28 – 0.38] and SB2010/SBMSY = 1.24 [0.91– 1.40] have been determined. Based on these values the best estimate of SBMSY/SB0 is 0.31 Resolution 13/10 provides that BLIM = 0.40 BMSY implying an SBLIM/SB0 of 0.12. Noting CB2.3.3.4, a value of 0.20 might be more prudent. However, even against this more conservative (but consistent with CB2.3.3.4) standard the base case median estimate of SB relative to its unfished state is 0.38 [0.28 - 0.38], where even the lower 95% confidence bound is well above the default value of 0. 20. Therefore, taking account of the uncertainty associated with the base case status estimates, there is a high degree of certainty (i.e. greater than 95%, as set out in MSC CR CB2.2.1.3) that the stock is above the point where recruitment would be impaired – the default value for this being around 50% of the BMSY level. This meets SG100.		
B	Guidepost		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Yes	Yes

	Justification	The current estimate of SB2010/SBMSY = 1.24 [0.91– 1.40]. And while the ASPM model run indicates that the target reference points may have been exceeded during the period of high catches in the mid 2000's (2003–2006), the WPTT agreed that the MFCL assessment, which indicates that fishing mortality is below the limit and target reference points during the whole time series, represents the best view of the stock. That being said there is concern that total catch has continued to rise with 400,292,t and 402,084 t landed in 2012 and 2013, respectively; well in excess of the previous MSY estimates. Such high yields would only be expected if recruitment corresponds to the longterm average. And while the prevous assessment showed that the stock was unlikely to support substantially higher yields based on the estimated levels of recruitment from the last 15 years catch rates have improved in the purse seine fishery while remaining stable for the Japanese longline fleet. The scientific committee concluded that – for the moment at least – 'it is difficult to know whether the stock is moving towards a state of being subject of overfishing'. They continurd, "thus, on the weight of evidence available in 2014, the yellowfin tuna stock is determined to be not overfished and not subject to overfishing. Specifically the scientific committee current fishing mortality is considered to be below the provisional target reference point of FMSY and, current spawning biomass is considered to be above the target reference point of SBMSY. On the basis of the most recent scientific report, an assessment using Multifan CL indicates that the SB>SBMSY and F<FMSY throughout – 'the stock has been above the MSY reference points in recent years' while another assessment using an Age Structured Production Model (ASPM) indicates that the stock has fluctuated around the target in recent years but is now believed by the scientific committee to be above the MSY reference points.  Hence there is a "high degree of certainty" that the stock has been above the MSY reference points in recent years. Thus, this meets SG100.
References		» IOTC-2011-WPTT13 Meeting Report, IOTC-2012-WPTT14-38, IOTC-2012-SC15-R[E], IOTC-2012-WPTT15-R[E]

Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
TRP	Analytically derived SBmsy	31%B0	1.24 (0.91–1.40)
LRP	MSC default (CB2.3.3.4)	20%B0	1.24 *(31/20) = 1.92

OVERALL PERFORMANCE INDICATOR SCORE	100

Evaluation Table for PI 1.1.2 YFT				
PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Yes	Yes	
	Justification	For this stock, MSY-related reference points (SBcurrent/SBmsy and Fcurrent/Fmsy) are estimated using an appropriate and high quality stock assessment (see PI 1.2.4) that takes account of major uncertainties. The target reference points have been set as ratios: B/BMSY and F/FMSY. This is reasonable and consistent with practice elsewhere as well as with MSC requirements. The reference points are estimated based on MSY and are appropriate for tuna stocks. MSY is estimated within the stock assessment and reported to the management system. The relation of the stock relative to MSY is reported as part of the determination of stock status: the SG80 is met. The stock assessment and reference points are summarised in IOTC-2012-SC15-R[E] and IOTC-2012-WPTT14-R[E] and are detailed in IOTC-2011-WPTT13 Meeting Report and IOTC-2012-WPTT14-38. MSY is reported to the management system, as are the ratios SBcurrent/SBmsy and Fcurrent/Fmsy and Sbcurrent/SB0. SBmsy as a proportion of B0 is not presented. The reference points estimated and presented are interim and are generally appropriate for the stock and are as required for management decision making as outlined at IOTC RES13/10. The SG80 level is therefore met.		

B	Guidepost		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		No	No
	Justification	Resolution 13/10 sets interim target (BMSY and FMSY) and limit (BLIM = 0.40 BMSY and FLIM = 1.40 FMSY) reference points for yellowfin tuna. No rationale is available to support these choices. Concerning the target stock level, and noting that while BMSY, B2010, and B0 are unknown, both SB2010/SB0 = 0.38 [0.28 – 0.38] and SB2010/SBMSY = 1.24 [0.91– 1.40] have been determined. Based on these values the best estimate of SBMSY/SB0 is 0.31 Resolution 13/10 provides that BLIM = 0.40 BMSY implying an SBLIM/SB0 of 0.12. Noting CB2.3.3.4, a value of 0.20 might be more prudent. Although the IOTC has yet to adopt a specific limit reference point, management advice is provided relative to MSY as a target. The default 50% BMSY is assumed here for purposes of defining stock status. However, the lack of a well-defined point indicates that the SG80 is not met.		
C	Guidepost		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Yes	No
	Justification	Here, with evidence of changing fishing patterns in recent years, the use of ratios can mask underlying changes in absolute values of BMSY and FMSY. The implied Blim of 14%B0 is below the default certification requirement of 20% B0. There is, however, no indication of impaired recruitment to date. The reference points in use are interim and work is planned to refine them using MSE to evaluate reference points and HCR. Clearly the intention of the IOTC (management response) and the basis on which scientific advice is supplied is to maintain the stock at or above the MSY level. Therefore, although an interim target reference point is defined at a level consistent with BMSY – thus meeting SG80 - a more precise definition justified through scientific analysis and research would be necessary before the higher guidepost could be met. In addition there remain issues of uncertainty (see section 3.3.4.4) particularly in respect of errors in the estimation of the stock status, and (ii) the estimation of MSY itself. These are specifically addressed by IOTC resolution 14/07 which seeks to standardise the presentation of scientific information in the annual scientific committee report and in working		

		party reports. In addition HCRs are being developed that will incorporate such uncertainty.		
D	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		Not Applicable	
	Justification	Not Applicable		
References		IOTC RES 13/10, IOTC-2011-WPTT13 Meeting Report, IOTC-2012-WPTT14-38, IOTC-2012-SC15-R[E], IOTC-2012-WPTT15-R[E]		
OVERALL PERFORMANCE INDICATOR SCORE				**75**
CONDITION NUMBER				**1**

Evaluation Table for PI 1.1.3 YFT				
PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?			
	Justification	This is not depleted and this PI is not taken into consideration.		

B	Guidepost	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted 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 depleted stock.
	Met?			
	Justification			
C	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?			
	Justification			
References				
OVERALL PERFORMANCE INDICATOR SCORE:				**N/A**

Evaluation Table for PI 1.2.1 YFT				
PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and

				limit reference points.
	Met?	Yes	Yes	No
	Justification	Scientific advice has been formulated relative to a harvest strategy which is, in turn, relative to MSY reference points. This is responsive to that state of the stock and to limit and target reference points commonly used for bigeye and other tropical tunas, meeting the SG80. However, because the strategy is not clearly defined but, rather is “implied.” and it is unclear whether the harvest strategy will be successful. Therefore, the designed aspect of the strategy to change overall selectivity cannot be given full credit, preventing meeting the SG100.		
B	Guidepost	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
	Justification	It is clear from the report of the WPTT that while the harvest strategy may not have been fully tested, none the less, monitoring is in place. Further It is evident from the most recent assessment that for this stock a) the catch is below MSY, b) the stock is not overfished. This indicates that overall controls on the exploitation of this stock have been adequate to date and the harvest strategy is achieving its objectives. This meets the SG80. That being said, and in the absence of direct evidence or the results of a full MSE, there is not specific evidence that the harvest strategy will work in practice under different circumstances. That is, it has not be full evaluated and there is no specific evidence exists to show that it is achieving its objectives (including being clearly able to maintain stocks at target levels). Further there is no pre-agreement on how to react to stock changes and stock assessments required to evaluate management performance are not frequent - given the stock is heavily exploited. It has yet to be shown that the management system can maintain stock at the target level (B>BMSY, F<FMSY), so the SG100 is not met.		
C	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Yes		

	Justification	The work of the WPTT provides clear evidence that monitoring of this stock is adequate to determine whether the harvest strategy is working. The different parts of the strategy include maintaining both B/BMSY and F/FMSY. Data are collected to estimate these quantities and updates and assessments conducted. The latter reports best estimates of biomass, which indicates whether management is achieving its objectives or not. That being said there is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible. Therefore the fishery clearly meets the SG60		
D	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			No
	Justification	There is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible. Therefore the fishery does not meet the SG100.		
E	Guidepost	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?			
	Justification	Not relevant.		
References		» IOTC RES 12/01, IOTC RES 13/10, IOTC-SC15-R[E], IOTC-WPTT14-R[E]		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**

Evaluation Table for PI 1.2.2 YFT			
PI 1.2.2	There are well defined and effective harvest control rules in place Note: SG60 SIs are from MSC CR 2.0		
Scoring Issue	SG 60	SG 80	SG 100

A	Guidepost	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 harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Yes	No	
	Justification	Following the MSC Notice, "Scoring of 'available' Harvest Control Rules (HCRs) in CRv1.3 fisheries" of 24th November, PI 1.2.2 SI a and c (below) are scored using CR v2.0 provisions for SG60 scoring. The notice provides for scoring using CR v2.0 at 1.2.2a and c but is aimed at avoiding 'incorrect interpretation' at CR v1.3 PI 1.2.2c. It is also aimed at ensuring consistency between assessments which are being harmonized (as is this assessment). CR v2.0 scoring guidance is provided at SA2.5.2 which includes conditions for use of CR v2.0 when generally understood HCR are considered to be available but not actually in place. The basis for SG60 scoring at PI 1.2.2a is that generally understood HCR are in place – through adoption specifically of IOTC Res 13/10. Conditions for use of CR v2.0 laid out at SA2.5.2 are therefore not relevant. At CR v2.0 GSA2.5 it is clear for SG60 scoring that "HCRs should be likely to ensure that stocks will be maintained above the PRI". At PI 1.1.2 SIb (above) it is noted the IOTC has implicitly adopted an interim LRP of 12.4% B0 but without justification. For the purposes of this assessment, and consistent with comments at PI 1.1.2 SIb, the PRI is assumed to be 20% Bo, consistent with MSC CR v1.3 CB2.3.3.4 and MSC CR v2.0 GSA2.2.3. Resolution IOTC RES 13/10 specifies interim MSY-related TRP and LRP and an interim framework for management based on status relative to the TRP. The framework is illustrated in Figure 3 of this assessment report and is used in SC advice to the Commission (e.g. IOTC-2013-SC16-R[E]). The resolution does not explicitly define overfishing but implicitly defines it as F/Fmsy > 1, consistent with Bmsy and well above 20%B0. At paragraph 4, the interim framework provides guidance on management aims depending on where the stock is estimated to be in quadrants of the Kobe Plot defined by F/Fmsy and B/Bmsy, and requiring certain outcomes with high probability depending on status relative to those reference points. Specifically, noting the Kobe Plot quadrants referred to are defined by the F and SB target reference points: HCRs will take account of the following objectives: a) For stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant; b) For stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible; c) For stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible; d) For stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible. No limit reference points are used in defining actions but the framework seeks to ensure with high probability that stocks below the Bmsy target reference points are rebuilt "in as short a period as possible" and if required that overfishing is ended with a high probability. As specified, regardless of		

		the SB limit reference point definition, exploitation rate should be reduced well before the PRI, taken as the MSC default of 20% Bo, might be approached. CR v2.0 allows for TRP-based HCR (with implied LRP) at GSA2.5 (boxed example on p 174 of Fisheries Standard v2.0). Paragraph 4 of IOTC Res 13/10 is explicit that "the SC shall develop and assess potential harvest control rules (HCRs) to be applied, considering the status of the stocks against the reference points assessed in paragraph 3 for albacore, bigeye tuna, skipjack tuna, yellowfin tuna and swordfish. Based on the results of the MSE and considering the guidelines set forth in the UNFSA and in Article V of the IOTC Agreement, the IOTC Scientific Committee will recommend to the Commission HCRs for these tuna and tuna-like species…" At paragraph 2, IOTC RES 13/10 requires that the IOTC Scientific Committee should endeavour to apply the interim framework in the provision of recommendations for management measures. The interim framework lays out general management aims without specifying exact actions, defining what constitutes "high probability", or specifying required rebuild periods. CR v2.0 GSA2.5, says that "HCRs should be regarded as only 'generally understood' as required to achieve a 60 score in cases where they can be shown to have been applied in some way in the past, but have not been explicitly defined or agreed." The IOTC HCR for yellowfin have been defined by IOTC Res 13/10 and have been agreed and put in place (adopted); more importantly, IOTC Res 13/10 lays out in general terms a familiar HCR framework used in multiple jurisdictions for many stock/fishery types. The IOTC and other tuna RFMOs are progressing HCR development through the Working Party on Tropical Tunas (WPPT) using Management Strategy Evaluation (MSE). The IOTC has provided clear guidance to the SC for developing what HCR must achieve at IOTC RES 13/10 Para 4. We conclude that there are, therefore, generally understood HCRs in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached, meeting SG 60 scoring requirements. HCRs are not well defined, as required for SG80 scoring.d)		
B	Guidepost		The **selection** of the harvest control rules takes into account the **main** uncertainties.	The **design** of the harvest control rules take into account a **wide** range of uncertainties.
	Met?		No	No
	Justification	The interim, general framework provides guidance on management only in relation to point (median) estimates of F/Fmsy and B/Bmsy, as well as through un-weighted, multi-model forecasts relative to the reference points (Kobe II Strategy Matrix). The point estimates are derived from only the base case assessment run so no consideration is taken of the wider set of sensitivity assessment runs. The forecasts do not fully account for model uncertainty. The HCR cannot be said to take account of the main uncertainties. The fishery does not meet SG80 & 100 SI(b)..		

C	Guidepost	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 harvest control rules.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Yes	No	No
	Justification	Following the MSC Notice, "Scoring of 'available' Harvest Control Rules (HCRs) in CRv1.3 fisheries" of 24th November, PI 1.2.2 SIa (above) and c are scored using CR v2.0 provisions for SG60 scoring. The notice provides for scoring using CR v2.0 at 1.2.2a and c but is aimed at avoiding 'incorrect interpretation' at CR v1.3 PI 1.2.2c. It is also aimed at ensuring consistency between assessments which are being harmonized (as is this assessment). CR v2.0 SA2.5.6 requires that as part of the evidence that tools are working, teams should include current levels of exploitation in the UoA, as measured by fishing mortality rate where available. Evidence from the 2014 stock status determination (IOTC-2014-SC17-R[E]) is that the exploitation rate (Fcur/Fmsy) was 0.61 (0.31-0.91) and in the base case assessment had never exceeded Fmsy. CR v2.0. GSA2.5.2-5 (at p176 of Fisheries Standard v2.0) as relates to SA2.5.6 notes that current F being "equal to or less than Fmsy should usually be taken as evidence that the HCR is effective." The continuing text does not elaborate on the meaning of 'usually' but concerns only cases where F is greater than Fmsy. The most recent up-date of the yellowfin stock assessment (November 2014) found that "on the weight-of-evidence available in 2014, the yellowfin tuna stock is determined to be not overfished and not subject to overfishing". There are a number of uncertainties (recruitment and effort) while "catch rates have improved for the purse seine fishery while remaining stable for the Japanese longline fleet." The IOTC concluded, that "it is difficult to know whether the stock is moving towards a state of being subject to overfishing". There are therefore some indications of the potential for fishing mortality to increase above Fmsy but the weight of evidence is that F is currently below Fmsy. GSA2.5.2-5 guidance states that this should usually be interpreted as HCR's being effective, and thus supports SG60 scoring using MSC CR 2.0.		
References		» C2_WK_MSE_REPORT (draft); IOTC-2011-SC14-40; IOTC-2011-SS4-PropA[E]; IOTC-2011-SS4-PropB[E], IOTC RES12/11; IOTC RES 12/13; IOTC-2012-WPTT-R[E]; IOTC-2013-TCAC02-R[E]; IOTC RES 13/10; IOTC-2014-SC17-R[E]		
OVERALL PERFORMANCE INDICATOR SCORE:				**60**
CONDITION NUMBER:				**2**

Evaluation Table for PI 1.2.3 YFT

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Yes	Yes	No
	Justification	Yellowfin data in the Indian Ocean are comprehensive, informative and relevant. These data consider (a) stock structure, (c) fleet composition (d) stock abundance (mainly standardised CPUE series) (e) fishery removals, and (f) other data and provide information on the spatial distribution of catches, their size frequencies, results of tagging studies as well as growth and mortality models. The data are adequate to allow appropriate stock assessments and to evaluate the status of the stock against target and limit reference points. In addition environmental data are used in CPUE standardization and to help explain recruitment. Stock structure data while limited are consistent with an Indian Ocean-wide stock. Overall, data are adequate for stock assessment and for an appropriate harvest control rule, and thus meet the SG80. However, despite the best efforts of the IOTC secretariat it remains the case that i) issues remain with some of these data and ii) there are information gaps such that it cannot be concluded that this information constitutes a comprehensive range of information. Consequently the data do not presently allow the implied harvest control rule to be applied with a high degree of certainty, so the SG100 is not met.		
b	Guidepost	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery 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
	Justification	IOTC has put considerable effort into the reporting and recording of catches by the contracting parties. These are summarised in the following resolutions: » 13/03 On the recording of catch and effort data by fishing vessels in the IOTC area of competence » 11/04 On a regional observer scheme » 10/02 Mandatory statistical requirements for IOTC Members & Cooperating Non-Contracting Parties » 10/08 Concerning a record of active vessels fishing for tunas and swordfish in the IOTC area » 10/09 Concerning the functions of the Compliance Committee » 06/03 On establishing a vessel monitoring system programme » 03/03 Concerning the amendment of the forms of the IOTC statistical documents The IOTC secretariat puts considerable effort into considering any issues identified relating to the statistics of tropical tunas. This list covers the main issues which the Secretariat considers affect the quality of the statistics available at the IOTC, by type of dataset and type of fishery. Specifically it includes issues relating to non-reporting of fishery removals and attempts to rectify or estimate these. Standardized CPUE indices are available from several fleets. Tagging data is also available. Together these are considered are adequate for the harvest strategy. While indicators of stock abundance - mainly standardised catch-per-unit-effort indices – are available, a single index covering the entire time series is not available. While data are sufficient to meet SG80 they do not presently allow the implied harvest control rule to be used with great confidence, preventing the SG100 being met.		
c				
	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Yes	

	Justification	CB 2.7.1 requires the identification of which information from the information categories in CB2.7.1.1 is relevant to the design and effective operational phases of the harvest strategy, Harvest Control Rules and tools, and that evaluation should be based on this information. In terms of the harvest strategy and its component parts, the most important data are fishery removals as inputs to the stock assessment used to determine stock status relative to MSY-related reference points. GCB 2.7.2 clarifies that the reference to 'other' fishery removals in scoring issue c relates to vessels outside or not covered by the unit of certification. These require good information but not necessarily to the same level of accuracy or coverage as that covered by the second scoring issue. In fact, as the harvest strategy works at Indian Ocean and IOTC level, not at the level of the unit of certification, "other removals" in this instance are effectively subsumed in to consideration of fishery removals at PI 1.2.3b and, consistent with that, it is clear that there is good information on all other fishery removals from the stock, consistent with SG80 scoring criteria. IOTC Resolution 13/03 requires that all purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres length overall and those under 24 metres if they fish outside the EEZs of their flag States within the IOTC area of competence to keep a bound paper or electronic logbook and to record, inter alia, the weight (kg) or number by species per set/shot/fishing event for each of a comprehensive list of species. For purse seine, this includes IOTC species, marine turtles, marine mammals, sharks, rays and other bony fish. It is apparent that IOTC has put considerable effort into the recording and reporting of catches and that the current level of reporting is adequate given the large number of small countries involved and the difficult task of monitoring small vessels often far away or on the high seas. Overall, data are sufficient to meet the SG80.
References		» IOTC–2011–WPDCS08–06; IOTC–2012–TCAC02–05[E]; IOTC-2012-WPT14-38
OVERALL PERFORMANCE INDICATOR SCORE		**80**

Evaluation Table for PI 1.2.4 YFT				
PI 1.2.4		There is an adequate assessment of the stock status.		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Yes	Yes

	Justification	The primary assessment tool for Indian Ocean yellowfin is Multifan-CL which incorporates multiple fisheries, gears, growth and selectivity models and spatial variability. Alternative model structures have been explored and sensitivity testing has been conducted; this has considered both model structure and uncertainty. The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery. The model is able to make use of the available data, meeting the SG100.		
b	Guidepost	The assessment estimates stock status relative to reference points.		
	Met?	Yes		
	Justification	The assessment estimates stock status relative to reference points and B2010/BMSY and F2010/FMSY are presented as point estimates with 95% confidence intervals, meeting the SG60.		
c	Guidepost	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
	Justification	In 2011, the WPTT undertook projections of yellowfin tuna stock status under a range of management scenarios, following the recommendation of both the Kobe process and the Commission (to harmonise technical advice to managers across RFMOs by producing Kobe II management strategy matrices). Management options presented represent three different levels of constant catch projection. Projections were carried out using 12 different scenarios based on similar scenarios used in the assessment. Probabilities were computed as the percentage of 12 scenarios being SB>SBMSY and F<FMSY in each year. Noting that there was considerable discussion on the ability of the WPTT to carry out the projections with MFCL for yellowfin tuna (for example, it was not clear how the projection redistributed the recruitment among regions as recent distribution of recruitment differs from historic; which was assumed in the projections) the WPTT agreed that the true uncertainty is unknown and that the current characterization is not complete. However the WPTT noted that the projections provide a relative ranking of different scenarios outcomes. As the matrices do not represent the full range of uncertainty from the assessments the inclusion of the K2SM at this time is primarily intended to familiarise the Commission with the format and method of presenting management advice. In summary the stock assessment methods used in the analysis of this stock report uncertainty in estimates of stock status. These uncertainties have also been examined as alternative model structures. Similarly the stock status associated with these alternatives have been evaluated in a probabilistic manner. The use of probability in the management advice allows risk to be taken into account in the decision making, meeting the SG100.		

d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			No
	Justification	Paper IOTC–2013–WPTT15–39 provides a Stock assessment on yellowfin tuna in the Indian Ocean using A Stock-Production Model Incorporating Covariates (ASPIC) with the nominal catch by fleet and the standardized CPUE of JPN LL and TWN LL updated up to 1972-2012. The authors noted that whereas the objective of this study was not to provide any management advices on this species it was, rather, to compare ASPIC results with those of MFCL and ASPM which were conducted in 2012. As a result (Kobe plot I; stock trajectory), it suggested that ASPIC and ASPM showed the similar pattern. The WPTT NOTED that one or the other series should be used, as they give contradictory signals. It would be better to run the CPUE series separately. The WPTT NOTED that in order to compare with latest stock assessments, this analysis should be carried out using similar inputs (i.e. CPUE series) as the ones used in MULTIFAN-CL. In summary while different assessment methods have been run and compared – constituting a degree of testing – there has not been a systematic testing of the assessment. Nor have alternative hypotheses and assessment approaches have been rigorously explored, preventing the SG100 being met.		
e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Yes	No
		The most recent stock assessment (IOTC-2012-WPTT14-38) was primarily conducted by a contracted assessment scientist. Thereafter it was reviewed by the WPTT, at which both national scientists and invited experts participate. Thus whereas there is clearly a degree of peer review (i.e. national scientists and invited experts review the work of the independent assessment scientist) that meets SG80 it is not clearly apparent that this review was externally reviewed and, on that basis, cannot be said to have met SG100		
References		» IOTC-2009-PRP-R[E]; IOTC-2011-WPTT13 Meeting Report; IOTC-2012-WPTT14-38; IOTC-2012-WPTT14-39; IOTC-2012-WPTT14-40 rev 2; IOTC-2012-WPTT14 R[E]; IOTC-2013-SC15 R[E]; Kobe 2 (2002) Report of the second joint meeting of tuna Regional Fisheries Management Organizations (RFMOs), San Sebastian, Spain, 2002		
OVERALL PERFORMANCE INDICATOR SCORE				**90**

Evaluation table for PI 1.1.1 BET

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	Guidepost	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Yes	Yes	Yes
	Justification	Concerning the target stock level, and noting that while BMSY, B2010, and B0 are unknown, both SB2012/SB1952 (=SB0) = 0.4 [0.27 – 0.54] and SB2012/SBMSY = 1.44 [0.87 – 2.22] have been determined. Based on these values the best estimate of SBMSY/SB0 is 0.28. Resolution 13/10 provides that BLIM = 0.50 BMSY implying an SBLIM/SB0 of 0.14. Noting CB2.3.3.4, a value of 0.21, (BLIM = 0.75 BMSY) might be more prudent. However, even against this more conservative (but consistent with CB2.3.3.4) standard the base case median estimate of SB relative to its unfished state is 0.40 [0.27-0.38], where even the lower 95% confidence bound is well above the default value of 0.21. Therefore, taking account of the uncertainty associated with the base case status estimates, there is a high degree of certainty (i.e. greater than 95%, as set out in MSC CR CB2.2.1.3) that the stock is above the point where recruitment would be impaired – the default value for this being around 50% of the BMSY level. This meets SG100.		
B	Guidepost		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Yes	Yes
	Justification	The current estimate of SB2012/SBMSY is 1.44 [0.87 – 2.22]. When other model approaches are used, as shown fin the Kobe plot, the high degree of confidence is maintained. That is, a) the Kobe plot shows that, based on the trajectory of the median of 12 plausible model options (purple points) the stock has always been above the target level; and b) based on the trajectory of the all 12 plausible model options there is no evidence to suggest that the stock has not been above or fluctuating around the target in recent years. The latter is necessary in order to have a high degree of certainty i.e. greater than 95%, as set out in MSC CR CB2.2.1.3. This meets SG100		
References				
Stock Status relative to Reference Points				
		Type of reference point	Value of reference point	Current stock status relative to reference point

TRP	Analytically derived SBmsy	28%B0	1.44 (0.87– 2.22)
LRP	MSC default (CB2.3.3.4)	20%B0	1.44*(0.28/.20) = 2.0
OVERALL PERFORMANCE INDICATOR SCORE			**100**

Evaluation table for PI 1.1.2 BET

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Yes	Yes	
	Justification	For this stock, the target reference points have been set as ratios: B/BMSY and F/FMSY. This is reasonable and consistent with practice elsewhere as well as with MSC requirements. The reference points are estimated based on MSY and are appropriate for tuna stocks. MSY is estimated within the stock assessment and reported to the management system. The relation of the stock relative to MSY is reported as part of the determination of stock status: the SG80 is met.		
B	Guidepost		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		No	No
	Justification	Resolution 13/10 sets interim target (BMSY and FMSY) and limit (BLIM = 0.50 BMSY and FLIM = 1.30 FMSY) reference points for bigeye tuna. No rationale is available to support these choices. As noted earlier, while BMSY, B2012, and B1952 (=B0) are unknown, both SB2012/SB1952 (=SB0) = 0.4 [0.27 – 0.54] and SB2012/SBMSY = 1.44 [0.87 – 2.22] have been determined. Based on these values the best estimate of SBMSY/SB0 is 0.28. Resolution 13/10 provides that BLIM = 0.50 BMSY implying an SBLIM/SB0 of 0.14. This is a low value to use without explanation and appears inconsistent with MSC requirements that specify that if the target reference point is analytically determined to be below 40% B0, and there is no analytically determined limit reference point, then the default value of Blim should be 20% B0. Alternatively, were SBMSY/SB0 < 0.27 then the default LRP should be 75%BMSY implying SBLIM/SB0 = 0.21. Although the IOTC has yet to adopt a		

		specific limit reference point, management advice is provided relative to MSY as a target. The default 50% BMSY is assumed here for purposes of defining stock status. However, the lack of a well-defined point indicates that the SG80 is not met.		
C	Guidepost		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Yes	No
	Justification	Here, with evidence of changing fishing patterns in recent years, the use of ratios can mask underlying changes in absolute values of BMSY and FMSY. The implied Blim of 14%B0 is below the default certification requirement of 20% B0. There is, however, no indication of impaired recruitment to date. The reference points in use are interim and work is planned to refine them using MSE to evaluate reference points and HCR. Clearly the intention of the IOTC (management response) and the basis on which scientific advice is supplied is to maintain the stock at or above the MSY level. Therefore, although an interim target reference point is defined at a level consistent with BMSY – thus meeting SG80 - a more precise definition justified through scientific analysis and research would be necessary before the higher guidepost could be met. In addition there remain issues of uncertainty (see section 3.3.4.4) particularly in respect of errors in the estimation of the stock status, and (ii) the estimation of MSY itself. These are specifically addressed by IOTC resolution 14/07 which seeks to standardise the presentation of scientific information in the annual scientific committee report and in working party reports. In addition HCRs are being developed that will incorporate such uncertainty.		
D	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		Not Applicable	
	Justification	Not Applicable		
References				

OVERALL PERFORMANCE INDICATOR SCORE	75
CONDITION NUMBER	5

Evaluation table for PI 1.1.3 BET

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?			
	Justification	This is not depleted and this PI is not taken into consideration.		
B	Guidepost	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted 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 depleted stock.
	Met?			
	Justification			
C	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to	

		specified timeframe.	rebuild the stock within a specified timeframe.	
	Met?			
	Justification			
References				
OVERALL PERFORMANCE INDICATOR SCORE:				NA

Evaluation table for PI 1.2.1 BET

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Yes	Yes	No
	Justification	Scientific advice has been formulated relative to a harvest strategy which is, in turn, relative to MSY reference points. This is responsive to that state of the stock and to limit and target reference points commonly used for bigeye and other tropical tunas, meeting the SG80. However, because the strategy is not clearly defined but, rather is “implied.” and it is unclear whether the harvest strategy will be successful. Therefore, the designed aspect of the strategy to change overall selectivity cannot be given full credit, preventing meeting the SG100.		

B	Guidepost	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
	Justification	It is clear from the report of the WPTT that while the harvest strategy may not have been fully tested, none the less, monitoring is in place. Further It is evident from the most recent assessment that for this stock a) the catch is below MSY, b) the stock is not overfished. This indicates that overall controls on the exploitation of this stock has been adequate to date and the harvest strategy is achieving its objectives. This meets the SG80. That being said, and in the absence of direct evidence or the results of a full MSE, there is not specific evidence that the harvest strategy will work in practice under different circumstances. That is, it has not be full evaluated and there is no specific evidence exists to show that it is achieving its objectives (including being clearly able to maintain stocks at target levels). Further there is no pre-agreement on how to react to stock changes and stock assessments required to evaluate management performance are not frequent - given the stock is heavily exploited. It has yet to be shown that the management system can maintain stock at the target level (B>BMSY, F<FMSY), so the SG100 is not met.		
C	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Yes		
	Justification	The work of the WPTT provides clear evidence that monitoring of this stock is adequate to determine whether the harvest strategy is working. The different parts of the strategy include maintaining both B/BMSY and F/FMSY. Data are collected to estimate these quantities and updates and assessments conducted. The latter reports best estimates of biomass, which indicates whether management is achieving its objectives or not. That being said there is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible. Therefore the fishery meets the SG60.		
D	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			No

	Justification	There is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible. Therefore the fishery does not meet the SG100.		
E	Guidepost	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?			
	Justification	Not relevant.		
References		» IOTC RES 12/01, IOTC RES 13/10, IOTC-SC15-R[E], IOTC-WPTT14-R[E]		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**

Evaluation table for PI 1.2.2 BET

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Yes	No	
	Justification	Harvest control rules for this stock are not well-defined and there is no specific plan of control if the stock size falls below the trigger point (MSY). There is, however, evidence of an intention to end overfishing and rebuild this stock should depletion occur and the scientific committee is called on to provide such advice. Therefore there are generally understood harvest rules in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached meeting the SG60. However these are neither well defined nor have they		

		been tested to ensure that the exploitation rate is reduced as limit reference points are approached; consequently the SG80 is not met.		
B	Guidepost		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		No	No
	Justification	As the current, interim, framework does not include well defined harvest control rules or specific guidance on management it then it cannot be said that selection of the harvest control rules takes into account the main uncertainties. Rather it must be concluded that the SG80 has not been met.		
C	Guidepost	There is some evidence that tools used to implement harvest control rules 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 harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Yes	No	No
	Justification	Evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation The IOTC was established at the 105th Session of the Council of the Food and Agriculture Organization of the United Nations (FAO) in 1993. As such the IOTC Members can make decisions concerning the management of tuna and tuna-like resources and their associated environment binding on all Members and Cooperating non-Contracting Parties. And while the Agreement was signed in 1993 it did not enter into force until March 27th 1996 on the accession of the tenth IOTC Contracting Party. This latter point is important for when, at the 6th session of the IOTC in 2001, the first resolution setting out management measures designed to limit fishing effort was introduced, it was a mere 5 years later. Resolution 01/04 sought to limit the fishing effort of vessels fishing bigeye tuna, and requested non-Members of IOTC to reduce their fishing effort in 2002 in relation to 1999 levels. It also provided for a review, at the 2002 Session, of the measures taken by non-Members to implement these reductions. Other resolutions followed. At the 8th session of the IOTC in 2003, resolution 03/01 was introduced. Once again this was concerned with limiting the fishing capacity but this time of all contracting parties and cooperating non-contracting parties alike. In its introduction, resolution 03/01 noted the recommendation from the Scientific Committee “that a reduction in catches of bigeye tuna from all gears should be implemented as soon as possible; that the stock of yellowfin tuna is being exploited close to, or possibly above MSY; and that the level of fishing effort of swordfish should not be increased”. This resolution also cited the FAO International Plan of		

		Action for the Management of the Fishing Capacity (IPOA) which provides that "States and Regional Fisheries Organisations confronted with an overcapacity problem, where capacity is undermining achievement of long-term sustainability outcomes, should endeavour initially to limit at present level and progressively reduce the fishing capacity applied to affected fisheries". It is thus very clear that resolution 03/01, when introduced, was intended as a tool to control harvest rates (i.e. fishing effort). In that sense, therefore, it must be considered a tool to implement a harvest control rule. The principle measure introduced in the 2003 resolution was a limit, applicable in 2004, 2005 and 2006, on the number of fishing vessels larger than 24 meters length overall. This was based on the number of such vessels registered in 2003 as a reference year. It applied to both contracting and cooperating non-contracting parties with more than 50 vessels on the 2003 IOTC Record of Vessels. It also ensured that the limitation on the number of vessels was commensurate with the corresponding overall tonnage expressed in both GRT (Gross Registered Tonnage) or GT (Gross Tonnage) and specified that, where vessels are replaced, the overall tonnage shall not be exceeded. In this resolution the IOTC also sought to take note of the interests of developing coastal States, in particular 'small island' developing States and territories whose economies depend largely on fisheries. Special provision was made for such contracting and cooperating non-contracting parties which had the objective of developing their fleets above the authorisations foreseen. These were required to draw up fleet development plans in accordance with the provisions of Resolution 02/05 and to submit these plans to the IOTC for information. The FDPs defined, inter alia, the type, size and origin of the vessels and the programming of their introduction into the fisheries. Three years later, in 2006, at the 10th session of the IOTC, resolution 06/05 extended the reach of the 2003 resolution to vessels less than 24 metres if they fished outside their flag state EEZ. Specifically in the years 2007, 2008 and 2009, both contracting and cooperating non-contracting parties were now required to limit (by gear type) the number of their vessels of 24 m overall length and over, and under 24 metres if they fished for tropical tunas in the IOTC Area outside their EEZ, to the number of their vessels notified to IOTC for 2006 in accordance with IOTC Resolution 05/04. The link with capacity in GRT (Gross Registered Tonnage) or in GT (Gross Tonnage) was maintained as were the special provisions for contracting parties which had the objective of developing their fleets above the authorisations foreseen; that is the Commission took note of the interests of the developing coastal States, in particular 'small island' developing States and territories whose economies depend largely on fisheries. Three years later, in 2009, resolution 06/05 (which only applied until 2009) was duly superseded by resolution 09/02. This new resolution applied to the years 2010 and 2011. It also introduced two new concepts. The first of these required that, within the period of application of the Resolution (2009 and 2010), CPCs could only change the number of their vessels, by gear type, provided that they could either demonstrate to the Commission (under the advice of the Scientific Committee) that the change in the number of vessels, by gear type, did not lead to an increase of fishing effort (E) on the fish stocks involved, or, that they were directly limiting catches using individual transferable quotas under a comprehensive national management plan which has been provided to the Commission. There is therefore now, for the first time, a link to F (from F = qE). The second new provision introduced by resolution 06/05 required CPCs to ensure that, where there was a proposed transfer of capacity to their fleet, the vessels to be transferred had to be on

		either the IOTC Record of Vessels or on the Record of Vessels of another tuna Regional Fisheries Management Organizations. Specifically, no vessels on the List of IUU Vessels of any Regional Fisheries Management Organization could be transferred. Finally, in 2012, resolution 09/02 (which only applied in 2010 and 2011) was itself superseded by resolution 12/11, this time applicable during the years 2012 and 2013. This kept all the key terms of the 2009 resolution (09/02) and critically retained the 2006 baseline for tropical tunas. Once again it required Contracting Parties and Cooperating Non-Contracting Parties (CPCs) to notify the IOTC Secretariat, by 31 December 2009, the lists of vessels, by gear type, over 24 meters overall length and over, and under 24 meters if the fished outside their Exclusive Economic Zone (EEZ), and corresponding overall capacity in GT, which have actively fished in accordance with the provision of IOTC Resolution 07/04 [10/07, 10/08]; 10/07 [12/07, 13/07, 14/05] for tropical tunas during the year 2006. It specifies (paragraph 3) that within the period of application of the Resolution, CPCs may only change the number of their vessels, by gear type, provided that they can either demonstrate to the Commission, under the advice of the IOTC Scientific Committee that the change in the number of vessels, by gear type, does not lead to an increase of fishing effort on the fish stocks involved or where they are directly limiting catches using individual transferable quotas under a comprehensive national management plan which has been provided to the Commission. CPCs are further required to ensure that where there is a proposed transfer of capacity to their fleet that the vessels to be transferred are on the IOTC Record of Vessels or on the Record of Vessels of other tuna Regional Fisheries Management Organisations. No vessels on the List of IUU Vessels of any Regional Fisheries Management Organisation may be transferred. Specific provision was also made for the implementation of fleet development plans. For CPCs which fail to introduce vessels in accordance with their Fleet Development Plans, the IOTC Compliance Committee and the Commission will give annual consideration to the related problems. In addition the IOTC Compliance Committee is required to verify, at any IOTC Plenary Session, the compliance of CPCs with the provisions of this Resolution, including the implementation, according to the notified programming, of the Fleet Development Plans. (In relation to the latter, the Commission is also required to give due consideration to the interests of the developing coastal States, in particular small islands developing States and territories within the IOTC area of competence). Finally, the limitation established by resolution 12/11 was to be applicable during the years 2012 and 2013. The IOTC undertook to review its implementation at the 2014 IOTC Session. This review (see section 3.3.4.2) was prepared by the IOTC Secretariat, and presented on 26th April 2014 as document IOTC-2014-CoC11-05 Rev1[E] Report on the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating Non-Contracting Parties. The report summarised the information available to the Secretariat (in accordance with IOTC Resolution 12/11) to assist CPCs in assessing compliance with the limitation on fishing capacity, in particular with the provisions of paragraph 1 of the Resolution. Specifically it included tables that indicate the reference limits on fishing capacity based on the tonnage and number of vessels declared as active in 2006 for tropical tunas. The report concluded “In relation to tropical tunas, the results indicate that the active capacity in 2013 (516,233 tons) has decreased relative to the baseline capacity of 2006 (576,163 tons), and it was just over half the reference limit capacity of 993,662 tons,

		that was expected for 2013. The lower than expected value is the results of reductions in capacity of most fleets, and also the failure of the majority of CPCs with a fleet development plan, to implement the plan”. Recalling that Paragraph 6 of resolution 12/11 allowed other CPCs develop their fleets in compliance with a properly introduced fleet development plan. This was IOTC taking note of the interests of the developing coastal States, in particular ‘Small Island’ developing States and territories whose economies depend largely on fisheries. However these plans were only valid if introduced to the IOTC by 31 December 2009 and were required to include inter alia, the type, size, gear and origin of the vessels intended as well as the programming (precise calendar for the forthcoming 10 years) of their introduction into the fisheries. As a consequence it is possible to calculate the total capacity increase envisaged in these fleet development plans: this amounted to 418,749 tonnes. As a consequence, the Reference Capacity for 2013 was no longer 576,163 tonnes but, instead, 993,662; or a total increase in the reference capacity (relative to the 2006 baseline) of some 172%. Against a backdrop of an increasing trend in F and a declining trend in B for the 3 main tropical species, yellowfin, skipjack and bigeye, such an increase seems incompatible with the principles of fisheries management. That being said, it is important to recall that 1) not alone did the active capacity not increase to the new reference capacity of 993,662 tonnes, on the contrary it declined by 10% relative to 2006 to 516,233 tonnes, and 2) further, had the capacity increased during the interval and had, as a consequence, the fishing mortality increased in any of the year after 2006 such that Fyear>2006 > FMSY then under the terms of resolution 13/10 the IOTC Scientific Committee were required to apply the interim reference points in the provision of advice on the status of stocks as well as when making recommendations for management measures. In respect to the latter the IOTC Scientific Committee was required to take account of the specific objectives, namely that it aimed at ending overfishing with a high probability in as short a period as possible. In other words, had the increased in capacity envisaged in the fleet development plans come about and had this resulted in overfishing then the IOTC Scientific Committee were required to make recommendations aimed at ending overfishing with a high probability. Recalling that IOTC-2014-CoC11-05 Rev1[E] Report on the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating Non-Contracting Parties concluded “In relation to tropical tunas, the results indicate that the active capacity in 2013 (516,233 tons) has decreased relative to the baseline capacity of 2006 (576,163 tons), and it was just over half the reference limit capacity of 993,662 tons, that was expected for 2013. Further recalling that the latest assessment of the status of IOTC tropical stocks. And noting that in each case the diagram shows the temporal trend in the ratios Bcurrent /BMSY (x-axis) and Fcurrent /FMSY (y-axis). Purple circles represent the annual median values over time. Dots indicate uncertainty in the current status estimated from models that make different assumptions. Bigeye: The 2013 assessment conducted by the Scientific Committee gave similar tendencies to the 2010 and 2011 assessments in terms of average trends. The results of the new assessment indicated that the ratio of Fcurrent/FMSY is estimated to be 0.42 (range: 0.21 to 0.80), indicating that overfishing is not occurring while the ratio of spawning biomass Bcurrent/BMSY is 1.44 (range: 0.87 to 2.2), indicating that the stock is not in an overfished state. Further the estimate of MSY is 132,000 tonnes and the 2012 catch was below this level. Resolution 13/10 established interim limit reference points for bigeye as 0.5BMSY and 1.3FMSY. These are not being exceeded.

AREA CLOSURES and QUOTA ALLOCATION SYSTEMS

In addition to the resolution(s) limiting fishing capacity discussed above, in 2014 IOTC introduced resolution 14/02. This recognizes that, based on past experience in the fishery, the potential production from the resource can be negatively impacted by excessive fishing effort. It also takes into account the available scientific information and advice, whereby the yellowfin tuna stock might have been over or fully exploited and the bigeye tuna stock may have been fully exploited in recent years. It recognizes that the IOTC Scientific Committee recommended that yellowfin tuna and bigeye tuna catches should not exceed the MSY levels which have been estimated at 300,000 tonnes for yellowfin tuna and at 110,000 tonnes for bigeye tuna and calls on members to implement a quota allocation system based on recommendations from the scientific committee.

It is very important to note that Resolution 14/02 supersedes IOTC Resolution 12/13. The latter explicitly linked the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24 m and vessels under 24m fishing outside of their own EEZ. The resolution also included specification for testing the effectiveness of the measure, regarded as a pilot. That testing was carried out in a timely fashion by independent analysts (IOTC-2011-SC14-40) who noted that:

"model results suggest that the extant network with only a two month IOTC closure has little impact on yellowfin tuna stocks either with the effort eliminated or redistributed.

and, that

"with a year-round closure of the IOTC area, the network could deliver conservation benefits improving the status of yellowfin tuna stocks under the assumption of total elimination of effort from the network area. Under the assumption that fishing effort was removed entirely, stock biomass increased, particularly in the larger age classes. However, in the scenario of a year round IOTC closure with effort reallocated evenly outside the area (for the purse seine fleet only) there was little impact on yellowfin stock status; with no change in biomass although a change in the age distribution of the population occurred due to the protection of juveniles in the IOTC area".

The IOTC-2011-SC14-40 report concluded that "It would therefore be precautionary to supplement closures with additional management measures, either to reduce fishing effort, ……. , or to apply catch controls such as the quota allocation system required in Resolution 10/01.

In relation to the first of these, it is evident that measures to reduce fishing effort have been sequentially introduced by IOTC for a considerable period, most recently by Resolution 12/11. In relation to the second, resolution 14/02 makes it compulsory for CPCs to establish an allocation system (Quota) or any other relevant measures based on the IOTC Scientific Committee recommendations for the main targeted species under the IOTC competence.

Conclusion

IOTC RES 12/13 explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ. The resolution also includes specification for testing the effectiveness of the measure, regarded as a pilot. That testing was carried out in a timely fashion by independent analysts (IOTC-2011-SC14-40) which found the limited, pilot measures insufficient to control exploitation but noted how extended measures could help to control exploitation, not so much by controlling catch volume but through improvements to the exploitation pattern (i.e. by reducing the selectivity of juvenile

		Yellowfin). Consideration of the spatial/temporal measures is also included in IOTC-2012-WPTT14-R[E]. It should be noted in this context that GCB 2.6.4 makes clear that control of exploitation rates need not be restricted to the use of HCR that respond directly to population size but might also, e.g., involve reducing exploitation rate on parts of the stock (as in the case of RES 12/13). Overall, the IOTC has demonstrated the ability via resolution to use spatial/temporal closures and intent to understand how these can be effective at controlling exploitation. This constitutes some evidence of use of an appropriate tool to control exploitation and to understand the efficacy of the tool. The IOTC has a long history of resolutions aimed at limiting effort/capacity. These include IOTC RES01/04, 03/01, 06/05, 09/02, and 12/11. Early resolutions were aimed at non-members but were soon extended to all Contracting Parties and Cooperating non-members (CPC). The most recent resolution, IOTC RES12/11, is aimed at determining fishing capacity for all IOTC CPC, to ensure stabilisation of the level of fishing capacity active on stocks of high commercial value (including yellowfin tuna). The resolution provides for planned fleet development and vessel replacement but is aimed at ensuring no effective increase in capacity from a 2006 baseline plus any agreed Fishery Development Plans (FDP) for the years 2007-2013. In addition, the IOTC has an ongoing process to develop a catch allocation scheme and has already developed allocation principles. IOTC RES 13/10 and the MSE research planning and contracting, and IOTC MSE workshop reports (C2_WK_MSE_REPORT), together with work on allocation (IOTC-2011-SS4-PropA[E], IOTC-2011-SS4-PropB[E], IOTC-2013-TCAC02-R[E]) clearly demonstrates the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction, though as of Nov 2013 these have not yet been used. On the basis of the foregoing there is clearly some evidence that tools used to implement harvest control rules have been introduced by the IOTC, that they are appropriate and that they have been effective in controlling exploitation.
References		
OVERALL PERFORMANCE INDICATOR SCORE:		**60**
CONDITION NUMBER:		**6**

Evaluation table for PI 1.2.3 BET

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be

				directly related to the current harvest strategy, is available.
	Met?	Yes	Yes	No
	Justification	Bigeye data in the Indian Ocean are comprehensive, informative and relevant. These data consider (a) stock structure, (c) fleet composition (d) stock abundance (mainly standardised CPUE series) (e) fishery removals, and (f) other data and provide information on the spatial distribution of catches, their size frequencies, results of tagging studies as well as growth and mortality models. The data are adequate to allow appropriate stock assessments and to evaluate the status of the stock against target and limit reference points. In addition environmental data are used in CPUE standardization and to help explain recruitment. Stock structure data while limited are consistent with an Indian Ocean-wide stock. Overall, data are adequate for stock assessment and for an appropriate harvest control rule, and thus meet the SG80. However, despite the best efforts of the IOTC secretariat it remains the case that i) issues remain with some of these data and ii) there are information gaps such that it cannot be concluded that this information constitutes a comprehensive range of information. Consequently the data do not presently allow the implied harvest control rule to be applied with a high degree of certainty, so the SG100 is not met.		
b	Guidepost	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery 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

	Justification	IOTC has put considerable effort into the reporting and recording of catches by the contracting parties. These are summarised in the following resolutions: » 13/03 On the recording of catch and effort data by fishing vessels in the IOTC area of competence » 11/04 On a regional observer scheme » 10/02 Mandatory statistical requirements for IOTC Members & Cooperating Non-Contracting Parties » 10/08 Concerning a record of active vessels fishing for tunas and swordfish in the IOTC area » 10/09 Concerning the functions of the Compliance Committee » 06/03 On establishing a vessel monitoring system programme » 03/03 Concerning the amendment of the forms of the IOTC statistical documents The IOTC secretariat puts considerable effort into considering any issues identified relating to the statistics of tropical tunas. This list covers the main issues which the Secretariat considers affect the quality of the statistics available at the IOTC, by type of dataset and type of fishery. Specifically it includes issues relating to non-reporting of fishery removals and attempts to rectify or estimate these. Standardized CPUE indices are available from several fleets. Tagging data is also available. Together these are considered are adequate for the harvest strategy. While indicators of stock abundance - mainly standardised catch-per-unit-effort indices – are available, a single index covering the entire time series is not available. While data are sufficient to meet SG80 they do not presently allow the implied harvest control rule to be used with great confidence, preventing the SG100 being met.		
c	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Yes	
	Justification	CB 2.7.1 requires the identification of which information from the information categories in CB2.7.1.1 is relevant to the design and effective operational phases of the harvest strategy, Harvest Control Rules and tools, and that evaluation should be based on this information. In terms of the harvest strategy and its component parts, the most important data are fishery removals as inputs to the stock assessment used to determine stock status relative to MSY-related reference points. GCB 2.7.2 clarifies that the reference to 'other' fishery removals in scoring issue c relates to vessels outside or not covered by the unit of certification. These require good information but not necessarily to the same level of accuracy or coverage as that covered by the second scoring issue. In fact, as the harvest strategy works at Indian Ocean and IOTC level, not at the level of the unit of certification, "other removals" in this instance are		

		effectively subsumed in to consideration of fishery removals at PI 1.2.3b and, consistent with that, it is clear that there is good information on all other fishery removals from the stock, consistent with SG80 scoring criteria. IOTC Resolution 13/03 requires that all purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres length overall and those under 24 metres if they fish outside the EEZs of their flag States within the IOTC area of competence to keep a bound paper or electronic logbook and to record, inter alia, the weight (kg) or number by species per set/shot/fishing event for each of a comprehensive list of species. For purse seine, this includes IOTC species, marine turtles, marine mammals, sharks, rays and other bony fish. It is apparent that IOTC has put considerable effort into the recording and reporting of catches and that the current level of reporting is adequate given the large number of small countries involved and the difficult task of monitoring small vessels often far away or on the high seas. Overall, data are sufficient to meet the SG80.
References		
OVERALL PERFORMANCE INDICATOR SCORE		**80**

Evaluation table for PI 1.2.4 BET

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Yes	No
	Justification	A variety of methods including ASAP, ASPM and SS3 have been used to model this stock. It is clear that care has been taken to ensure that the assessment is appropriate for the stock and for the harvest strategy (and implied HCRs) and takes into account the major features relevant to the biology of the species and the nature of the fishery. Alternative models are explored. Overall the assessment Is appropriate for the stock and for the harvest control rule and thus meets the SG80. However there remain issues with some parameters which could impact the current of stock status. As such the assessment does not take into account all major features relevant to biology of the species and the nature of the fishery and, consequently, has not achieved SG100.		

b	Guidepost	The assessment estimates stock status relative to reference points.		
	Met?	Yes		
	Justification	The assessment estimate stock status relative to reference points and SB2012/SBMSY (rather than B2012/BMSY) and F2010/FMSY are presented as point estimates with 95% confidence intervals, meeting the SG60.		
c	Guidepost	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	No
	Justification	IOTC–2013–WPTT15 Reports that the WPTT NOTED that a range of quantitative modelling methods (ASAP, ASPM and SS3) were applied to bigeye tuna in 2013 and provide an overview of the key features of each of the three stock assessments a summary of the assessment results. The WPTT also noted the value of comparing different modelling approaches evaluating alternative hypothesis about the quality of the data used. Evaluating and validating the data is integral in the assessment, as fitting to alternative CPUE indices and assuming different model structures can have a large influence on the assessments. Hence, stock assessment methods have been use report uncertainty in estimates of stock status. Likewise uncertainties have been examined as alternative model and the stock status associated with these alternatives have been evaluated in a probabilistic manner by weighting of the alternatives. While these weightings may not be rigorous they represent a consensus of experts on the relative importance. These have then been presented as Kobe plots and a Kobe strategy matrix. However, given the type of uncertainties in the model, it is not possible for the assessment to provide probabilistic management advice suitable to take account of risk. Therefore, while the SG80 is met, but not the SG100.		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			No
	Justification	While a range of quantitative modelling methods (ASAP, ASPM and SS3) were applied to bigeye tuna in 2013 – constituting a degree of testing – there has not been a systematic testing of the assessment. Nor have alternative hypotheses and assessment approaches have been rigorously explored, preventing the SG100 being met.		

e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Yes	No
		The stock assessment of bigeye is primarily reviewed through the Working Party for Tropical Tunas of the IOTC's Scientific Committee. Additionally, outside experts are invited to participate in the Working Party meetings. Thus whereas there is clearly a degree of peer review that meets SG80 it is not clearly apparent that this review was externally reviewed and, on that basis, cannot be said to have met SG100		
References				
OVERALL PERFORMANCE INDICATOR SCORE				**80**

Evaluation table for PI 2.1.1 SJK

PI 2.1.1		**The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Yes	Yes	No

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
	Justification	

As this is an industrial fishery that catches large volumes of fish in individual sets, handling processes do not allow sorting or accurate monitoring of retained catch. Practically all fish that is captured enters refrigerated tanks all species other than some large sharks and/or rays are retained. The main source of data available for evaluating retained and bycatch species PI's are published data emanating from EU data collection regulations and Data Collection Framework (DCF). This has been supported in some cases by information of a more general nature from the Echebastar group.

Freeschool sets typically yield a catch that will comprise a mix of tuna species. While free school set catches are generally dominated by yellowfin tuna, varying quantities of bigeye tuna are usually taken at the same time and from time to time significant catches of skipjack may also be made, often along with yellowfin and bigeye. When skipjack is caught, catches of both yellowfin and bigeye tuna are common and often exceed the 5% threshold for consideration as 'main 'retained species, although not always so. The exact composition of the tuna catch in a freeschool set is impossible to predict and this results in a wide variance in tuna catches between individual sets. Because both yellowfin and /or bigeye tuna may be captured in excess of the 5% threshold along with skipjack, it is considered appropriate to consider both ***bigeye and yellowfin as main retained species*** (and therefore individual scoring elements).

Both bigeye tuna and yellowfin tuna are known to be highly likely to be within biologically based limits. Indian ocean tuna stock status is reviewed in the Report of the Fifteenth Session of the IOTC Working Party on Tropical Tunas (IOTC-2012-WPTT15-R[E]) and is repeated below. Both stocks are therefore considered to meet with the 80 scoring guide.

TABLE 1. Bigeye tuna: Status of bigeye tuna (*Thunnus obesus*) in the Indian Ocean

Area[1]	Indicators		2013 stock status[2] determination
Indian Ocean	Catch in 2012:	115,793 t	
	Average catch 2008–2012:	107,603 t	
	MSY (1000 t):	132 t (98.5–207 t)[3]	
	F_{2012}/F_{MSY}:	0.42 (0.21–0.80)[3]	
	SB_{2012}/SB_{MSY} :	1.44 (0.87–2.22)[3]	
	SB_{2012}/SB_0:	0.40 (0.27–0.54)[3]	

TABLE 1. Yellowfin tuna: Status of yellowfin tuna (*Thunnus albacares*) in the Indian Ocean

Area[1]	Indicators			2013 stock status determination
Indian Ocean	Catch 2012:	368,663 t		
	Average catch 2008–2012:	317,505 t		
		Multifan	ASPM	
	MSY (1000 t):	344 t (290–453 t)	320 (283–358 t)	
	F_{2010}/F_{MSY}:	0.69 (0.59–0.90)	0.61 (0.31–0.91)	
	SB_{2010}/SB_{MSY}:	1.24 (0.91–1.40)	1.35 (0.96–1.74)	
	SB_{2010}/SB_0 :	0.38 (0.28–0.38)	-	

Source: IOTC IOTC–2013–WPTT15–R[E]

In terms of other non-target tuna species that may be retained, data from Pesqueras Echebastar shows that Albacore tuna (*Thunnus alalunga)* may also be captured, occasionally in significant volumes – up to several tons in a freeschool set. However, albacore catches have not met with or exceeded the 5% main retained species threshold in a review of freeschool set catch data for the fleet under assessment going back to 2008.

Amande *et al* (2008) (updated for the French fleet by Chavance *et al* 2011) reviewed bycatch and discards of the EU purse seine tuna fishery in the Indian Ocean, using data collected during the period 2003-2007. Bycatch is calculated by species groups (tunas/bony fish/ billfish/sharks/rays) using observer data. Free-school set tuna bycatch typically comprises small volumes of bullet tuna, frigate tuna and kawakawa (tunny). Overall bycatch of tunas

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
		amounted to 9.3t per 1000 t of landed tuna (equivalent to <1% of tuna catch) for the EU Indian Ocean purse seine fleet. Correspondingly, 1.5t of bony fish, 0.4 t of billfish, 0.3t of sharks and 0.2t of rays were captured for every 1000 t landed tuna. A total of 55 different bony fish species were captured, 93 % of which (by weight and number) were taken in the FAD fishery (not being considered here). Bycatch of billfish comprised six main species – black marlin, striped marlin, blue marlin, Indo-pacific sailfish, swordfish and shortbill spearfish. Of the total estimated billfish catch, approximately two thirds is made by the FAD fishery meaning that of the estimated 148 tonne total billfish biomass captured, some 50 t were captured by the free-school fishery over the period (approximately 10-12t per year, equivalent to approximately 400kg of billfish per 1000t landed tuna). The corresponding figure for ray bycatch is 0.2t/1000t landed tuna. The main species encountered were pelagic stingray, giant manta, Chilean devil ray, devil-fish and spine tail mobula. Shark bycatch for the period is estimated at 300kg per 1000t landed tuna. Oceanic white tip and silky shark accounted for 94% of landings by number and 90% by weight. Other species present included short-fin mako, blue shark, dusky shark and scalloped hammerhead shark. Apart from the tuna species, little information is available in relation to the status of most if not all of the populations referred to by Amande *et al* (2008) and they are considered data deficient therefore in the context of the MSC assessment. As described earlier in the report, there are few opportunities to sort catch once it comes aboard. For the purposes of this assessment, almost all species indicated by Amande *et al* (2008) as being captured in EU Indian Ocean purse seine tuna fisheries have been considered under the retained species criterion. Exceptions are whale shark, turtles and manta rays, all of which have been scored under the ETP criterion. The rates of bycatch for the free-school fishery are considered very low in comparison to the FAD based fishery and exceptionally low when compared to other fishing methods such as longline. Implications of bycatch in the free-school fishery for populations of species teleost fish, billfish, ray and sharks identified above are considered insignificant and therefore negligible, on account of the low rates of capture. Also, some species (especially teleost fish) are highly fecund and have short life spans meaning that populations are likely to be robust to fishing pressure. Some of the above species/species groups are vulnerable at population level to fishing impacts. Such species include billfish (marlins in particular), some shark species (silky and oceanic white tip) as well as rays – mantas and mobula rays in particular. However, indicated rates of interaction with the most vulnerable of these (some billfish species, silky and oceanic white tip shark) are sufficiently low in the free-school fishery so as to consider bycatch in the freeschool fishery not to be a threat to populations. Despite this, the assessment process decided on a precautionary approach and implemented the MSC RBF during the site visit in respect of data deficient retained species. During the process that included four stakeholder consultations, silky shark was identified as the most vulnerable data deficient scoring element and silky shark has therefore been considered as a main retained species. A qualitative risk assessment was carried out using Scale Intensity Consequence Analysis (SICA). SICA indicated a most plausible worst-case scenario SICA score of 2 for silky shark. According to Table CC14 of the CR, this equates to an MSC score of 80 for retained catch of silky shark in the freeschool fishery. According to CR v1.3, all scoring elements for the main retained species including bigeye and yellow fin tuna, and silky shark meet with SG 80 that is the main retained species are highly likely to be within biologically based limits, and therefore a score of 80 is awarded for this issue of PI 2.1.1. Scoring at SG100 is not indicated due to uncertainties with respect to main retained species stock status and undefined reference points.		
b	**Guidepost**			Target reference points are defined for retained species.
	Met?			No

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
	Justification	Target reference points are not defined for all retained species therefore SG100 cannot be met.		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Yes	Yes	
	Justification	Main retained species are known to be within biologically based limits or risks to vulnerable data deficient species are within acceptable limits. Therefore, this issue is determined to meet the requirements of SG 60 and 80. Bycatch of silky shark scores 80 using SICA qualitative risk based analysis. EU purse seine vessels reportedly release sharks when they are captured, although it is likely that this is not always possible and does not always happen. Poisson *et al* (2011) discusses capture of shark species on EU purse seine vessels. An analysis of discarded sharks noted that there was a mortality rate after release of up to 50% up to15 days after capture. It is likely that the mortality rate of silky sharks from this fishery is negligible relative to the mortality rate fin tuna longline fisheries and from targeted shark fisheries. It is unlikely therefore that the purse seine free school fishery plays a significant role in terms of recovery and or rebuilding.		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Yes		
	Justification	Stock status is known for main retained species. SICA analysis has estimated the MSC equivalent score for the most vulnerable data deficient species (silky shark) to be 80. This issue is determined to meet the requirements of the SG 60 level.		
References		» Dagorn L, Holland KN, Restrepo V, Moreno G. 2013. Is it good or bad to fish with FADs? What are the real impacts of the use of drifting FADs on pelagic marine ecosystems? Fish and Fisheries. 14(3): 391-415. » Amande, M.J., Ariz, J., Chassot, E. et al. (2008) Bycatch and discards of the European purse seine tuna fishery in the Indian Ocean: Characteristics and estimation for the 2003-2007 period. Indian Ocean Tuna Commission document, IOTC-2008-WPEB-12, 23 pp. » Echebastar S.A. catch data 2008-2011, Western Indian Ocean tuna fishery		

PI 2.1.1	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
	» Chavance, P., Amande, J.M., Pianet, R., Chassot, E. and Damiano, A. 2011. Bycatch and Discards of the French Tuna Purse Seine Fishery during the 2003-2010 Period estimated from Observer data IOTC-2011-WPEB07-23 Rev_1 » Poisson F., Vernet A.L., Filmalter J.D., Goujon M., Dagorn L. 2011. Survival rate of silky sharks (*Carcharhinus falciformis*) caught incidentally onboard French tropical purse seiners. IOTC-20110WPEB07-28 » Pianet R., 2006. Analysis of data obtained from observer programmes conducted in 2005 and 2006 in the Indian Ocean on board of French purse seiners. IOTC, WPBE » Delgado de Molina A., Ariz J., Sarralde R., Pallarés P. and J. C. Santana, 2005. Activity of the Spanish purse seine fleet in the Indian Ocean and by-catch data obtained from observer programmes conducted in 2003 and 2004. IOTC-2005-WPBy-13 » Romanov E. V., 2002. By-catch in the tuna purse-seine fisheries of the western Indian Ocean. Fish. Bull.100(1): 90-105 » Sarralde R., Delgado de Molina A., Ariz J. and J. C. Santana, 2006. Data obtained from purse-seine observers carry out by the Instituto Español de Oceanografía from the National Database Plan between 2003 and 2006. IOTC-2006-WPTT-07 » Report of the Fifteenth Session of the IOTC Working Party on Tropical Tunas IOTC–2013–WPTT15–R[E]
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 2.1.1 YFT

PI 2.1.1		**The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Yes	Yes	No

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
	Justification	

As this is an industrial fishery that catches large volumes of fish in individual sets, handling processes do not allow sorting or accurate monitoring of retained catch. Practically all fish that is captured enters refrigerated tanks all species other than some large sharks and/or rays are retained. The main source of data available for evaluating retained and bycatch species PI's are published data emanating from EU data collection regulations and Data Collection Framework (DCF). This has been supported in some cases by information of a more general nature from the Echebastar group.

Freeschool sets typically yield a catch that will comprise a mix of tuna species. While free school set catches are generally dominated by yellowfin tuna, varying quantities of bigeye tuna are usually taken at the same time and from time to time significant catches of skipjack may also be made, often along with yellowfin and bigeye. When yellowfin tuna is caught, catches of both skipjack and bigeye tuna are common and may occasionally exceed the 5% threshold for consideration as 'main' retained species, especially in the case of bigeye tuna. The exact composition of the tuna catch in a freeschool set is impossible to predict and this results in a wide variance in tuna catches between individual sets. Because both bigeye and/or skipjack tuna may be captured in excess of the 5% threshold along with yellowfin tuna, it is considered appropriate to consider both ***bigeye and skipjack as main retained species*** (and therefore individual scoring elements).

Both bigeye tuna and skipjack tuna are known to be highly likely to be within biologically based limits. Indian ocean tuna stock status is reviewed in the Report of the Fifteenth Session of the IOTC Working Party on Tropical Tunas (IOTC-2012-WPTT15-R[E]) and is repeated below. Both stocks are therefore considered to meet with the 80 scoring guide.

TABLE 1. Bigeye tuna: Status of bigeye tuna (*Thunnus obesus*) in the Indian Ocean

Area[1]	Indicators		2013 stock status[2] determination
Indian Ocean	Catch in 2012:	115,793 t	
	Average catch 2008–2012:	107,603 t	
	MSY (1000 t):	132 t (98.5–207 t)[3]	
	F_{2012}/F_{MSY}:	0.42 (0.21–0.80)[3]	
	SB_{2012}/SB_{MSY} :	1.44 (0.87–2.22)[3]	
	SB_{2012}/SB_0:	0.40 (0.27–0.54)[3]	

TABLE 1. Status of skipjack tuna (*Katsuwonus pelamis*) in the Indian Ocean

Area[1]	Indicators		2013 stock status determination
Indian Ocean	Catch 2012:	314,537 t	
	Average catch 2008–2012:	400,980 t	
	MSY (1000 t):	478 t (359–598 t)	
	F_{2011}/F_{MSY} :	0.80 (0.68–0.92)	
	SB_{2011}/SB_{MSY} :	1.20 (1.01–1.40)	
	SB_{2011}/SB_0:	0.45 (0.25–0.65)	

Source: IOTC IOTC–2013–WPTT15–R[E]

In terms of other non-target tuna species that may be retained, data from Pesqueras Echebastar shows that Albacore tuna (*Thunnus alalunga)* may also be captured, occasionally in significant volumes – up to several tons in a freeschool set. However, albacore catches have not met with or exceeded the 5% main retained species threshold in a review of freeschool set catch data for the fleet under assessment going back to 2008.

Amande *et al* (2008) (updated for the French fleet by Chavance *et al* 2011) reviewed bycatch and discards of the EU purse seine tuna fishery in the Indian Ocean, using data collected during the period 2003-2007. Bycatch is calculated by species groups (tunas/bony fish/ billfish/sharks/rays) using observer data. Free-school set tuna bycatch typically comprises small volumes of bullet tuna, frigate tuna and kawakawa (tunny). Overall bycatch of tunas amounted to 9.3t per 1000 t of landed tuna (equivalent to <1% of tuna catch) for the EU Indian Ocean purse seine fleet. Correspondingly, 1.5t of bony fish, 0.4 t of billfish, 0.3t of

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
		sharks and 0.2t of rays were captured for every 1000 t landed tuna. A total of 55 different bony fish species were captured, 93 % of which (by weight and number) were taken in the FAD fishery (not being considered here). Bycatch of billfish comprised six main species – black marlin, striped marlin, blue marlin, Indo-pacific sailfish, swordfish and shortbill spearfish. Of the total estimated billfish catch, approximately two thirds is made by the FAD fishery meaning that of the estimated 148 tons total billfish biomass captured, some 50 t were captured by the free-school fishery over the period (approximately 10-12t per year, equivalent to approximately 400kg of billfish per 1000t landed tuna). The corresponding figure for ray bycatch is 0.2t/1000t landed tuna. The main species encountered were pelagic stingray, giant manta, Chilean devil ray, devilfish and spine tail mobula. Shark bycatch for the period is estimated at 300kg per 1000t landed tuna. Oceanic white tip and silky shark accounted for 94% of landings by number and 90% by weight. Other species present included short-fin mako, blue shark, dusky shark and scalloped hammerhead shark. Apart from the tuna species, little information is available in relation to the status of most if not all of the populations referred to by Amande *et al* (2008) and they are considered data deficient therefore in the context of the MSC assessment. As described earlier in the report, there are few opportunities to sort catch once it comes aboard. For the purposes of this assessment, almost all species indicated by Amande et al (2008) as being captured in EU Indian Ocean purse seine tuna fisheries have been considered under the retained species criterion. Exceptions are whale shark, turtles and manta rays, all of which have been scored under the ETP criterion. The rates of bycatch for the free-school fishery are considered very low in comparison to the FAD based fishery and exceptionally low when compared to other fishing methods such as longline. Implications of bycatch in the free-school fishery for populations of species teleost fish, billfish, rays and sharks identified above are considered insignificant and therefore negligible, on account of the low rates of capture. Also, some species (especially teleost fish) are highly fecund and have short life spans meaning that populations are likely to be robust to fishing pressure. Some of the above species/species groups are vulnerable at population level to fishing impacts. Such species include billfish (marlins in particular), some shark species (silky and oceanic white tip) as well as rays – mantas and mobula rays in particular. However, indicated rates of interaction with the most vulnerable of these (some billfish species, silky and oceanic white tip shark) are sufficiently low in the free-school fishery so as to consider bycatch in the freeschool fishery not to be a threat to populations. Despite this, the assessment process decided on a precautionary approach and implemented the MSC RBF during the site visit in respect of data deficient retained species. During the process that included four stakeholder consultations, silky shark was identified as the most vulnerable data deficient scoring element and silky shark has therefore been considered as a main retained species. A qualitative risk assessment was carried out using Scale Intensity Consequence Analysis (SICA). SICA indicated a most plausible worst-case scenario SICA score of 2 for silky shark. According to Table CC14 of the CR, this equates to an MSC score of 80 for retained catch of silky shark in the freeschool fishery. Further details are provided in sections 4 and 6 of the report as well as in Appendix 1.2. According to CR v1.3, all scoring elements for the main retained species including bigeye and skipjack tuna, and silky shark meet with SG 80, that is the main retained species are highly likely to be within biologically based limits, and therefore a PI score of 80 is awarded for this issue of PI 2.1.1. Scoring at SG 100 is not indicated due to uncertainties with respect to main retained species stock status and undefined reference points.		
b	**Guidepost**			Target reference points are defined for retained species.
	Met?			No
	Justification	Target reference points are defined for tuna species but not for all retained species scoring elements. Therefore SG100 cannot be met.		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Yes	Yes	
	Justification	Main retained species are all within biologically based limits. Stock status for Indian Ocean bigeye tuna and skipjack tuna are both within biologically based limits. Therefore, this issue is determined to meet the requirements of SG 60 and 80. Bycatch of silky shark scores 80 using SICA qualitative risk based analysis. EU purse seine vessels reportedly release sharks when they are captured, although it is likely that this is not always possible and does not always happen. Poisson *et al* (2011) discusses capture of shark species on EU purse seine vessels. An analysis of discarded sharks noted that there was a mortality rate after release of up to 50% up to15 days after capture. It is likely that the mortality rate of silky sharks from this fishery is negligible relative to the mortality rate in tuna longline fisheries and from targeted shark fisheries. It is unlikely therefore that the purse seine free school fishery plays a significant role in terms of recovery and or rebuilding.		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Yes		
	Justification	Stock status is known for main retained species. SICA analysis has estimated the MSC equivalent score for the most vulnerable data deficient species (silky shark) to be 80. Therefore this issue is determined to meet the requirements of SG 60.		
References		» Dagorn L, Holland KN, Restrepo V, Moreno G. 2013. Is it good or bad to fish with FADs? What are the real impacts of the use of drifting FADs on pelagic marine ecosystems? Fish and Fisheries. 14(3): 391-415. » Amande, M.J., Ariz, J., Chassot, E. et al. (2008) Bycatch and discards of the European purse seine tuna fishery in the Indian Ocean: Characteristics and estimation for the 2003-2007 period. Indian Ocean Tuna Commission document, IOTC-2008-WPEB-12, 23 pp. » Echebastar S.A. catch data 2008-2011, Western Indian Ocean tuna fishery » Chavance, P., Amande, J.M., Pianet, R., Chassot, E. and Damiano, A. 2011. Bycatch and Discards of the French Tuna Purse Seine Fishery during the 2003-2010 Period estimated from Observer data IOTC-2011-WPEB07-23 Rev_1 » Pianet R., 2006. Analysis of data obtained from observer programmes conducted in 2005 and 2006 in the Indian Ocean on board of French purse seiners. IOTC, WPBE		

PI 2.1.1	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
	» Delgado de Molina A., Ariz J., Sarralde R., Pallarés P. and J. C. Santana, 2005. Activity of the Spanish purse seine fleet in the Indian Ocean and by-catch data obtained from observer programmes conducted in 2003 and 2004. IOTC-2005-WPBy-13 » Romanov E. V., 2002. By-catch in the tuna purse-seine fisheries of the western Indian Ocean. Fish. Bull.100(1): 90-105 » Sarralde R., Delgado de Molina A., Ariz J. and J. C. Santana, 2006. Data obtained from purse-seine observers carry out by the Instituto Español de Oceanografía from the National Database Plan between 2003 and 2006. IOTC-2006-WPTT-07 » Poisson F., Vernet A.L., Filmalter J.D., Goujon M., Dagorn L. 2011. Survival rate of silky sharks (*Carcharhinus falciformis*) caught incidentally onboard French tropical purse seiners. IOTC-20110WPEB07-28 » Report of the Fifteenth Session of the IOTC Working Party on Tropical Tunas IOTC–2013–WPTT15–R[E]
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 2.1.1 BET

PI 2.1.1		**The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Yes	Yes	No

Justification

As this is an industrial fishery that catches large volumes of fish in individual sets, handling processes do not allow sorting or accurate monitoring of retained catch. Practically all fish that is captured enters refrigerated tanks all species other than some large sharks and/or rays are retained. The main source of data available for evaluating retained and bycatch species PI's are published data emanating from EU data collection regulations and Data Collection Framework (DCF). This has been supported in some cases by information of a more general nature from the Echebastar group.

Freeschool sets typically yield a catch that will comprise a mix of tuna species. While free school set catches are generally dominated by yellowfin tuna, varying quantities of bigeye tuna are usually taken at the same time and from time to time significant catches of skipjack may also be made, often along with yellowfin and bigeye. When bigeye tuna is caught, catches of both skipjack and bigeye tuna are common and may occasionally exceed the 5% threshold for each for consideration as 'main' retained species, especially in the case of yellowfin tuna. The exact composition of the tuna catch in a freeschool set is impossible to predict and this results in a wide variance in tuna catches between individual sets. Because both yellowfin and/or skipjack tuna may be captured in excess of the 5% threshold along with bigeye tuna, it is considered appropriate to consider both ***yellowfin and skipjack as main retained species*** (and therefore individual scoring elements).

Both yellowfin tuna and skipjack tuna are known to be highly likely to be within biologically based limits. Indian ocean tuna stock status is reviewed in the Report of the Fifteenth Session of the IOTC Working Party on Tropical Tunas (IOTC-2012-WPTT15-R[E]) and is repeated below. Both stocks are therefore considered to meet with the 80-scoring guide.

TABLE 1. Yellowfin tuna: Status of yellowfin tuna (*Thunnus albacares*) in the Indian Ocean

Area[1]	Indicators			2013 stock status determination
Indian Ocean	Catch 2012:	368,663 t		
	Average catch 2008–2012:	317,505 t		
		Multifan	ASPM	
	MSY (1000 t):	344 t (290–453 t)	320 (283–358 t)	
	F_{2010}/F_{MSY}:	0.69 (0.59–0.90)	0.61 (0.31–0.91)	
	SB_{2010}/SB_{MSY}:	1.24 (0.91–1.40)	1.35 (0.96–1.74)	
	SB_{2010}/SB_0:	0.38 (0.28–0.38)	-	

TABLE 1. Status of skipjack tuna (*Katsuwonus pelamis*) in the Indian Ocean

Area[1]	Indicators		2013 stock status determination
Indian Ocean	Catch 2012:	314,537 t	
	Average catch 2008–2012:	400,980 t	
	MSY (1000 t):	478 t (359–598 t)	
	F_{2011}/F_{MSY}:	0.80 (0.68–0.92)	
	SB_{2011}/SB_{MSY}:	1.20 (1.01–1.40)	
	SB_{2011}/SB_0:	0.45 (0.25–0.65)	

Source: IOTC IOTC–2013–WPTT15–R[E]

In terms of other non-target tuna species that may be retained, data from Pesqueras Echebastar shows that Albacore tuna (*Thunnus alalunga)* may also be captured, occasionally in significant volumes – up to several tons in a freeschool set. However, albacore catches have not met with or exceeded the 5% main retained species threshold in a review of freeschool set catch data for the fleet under assessment going back to 2008.

Amande *et al* (2008) (updated for the French fleet by Chavance *et al* 2011) reviewed bycatch and discards of the EU purse seine tuna fishery in the Indian Ocean, using data collected during the period 2003-2007. Bycatch is calculated by species groups (tunas/bony fish/ billfish/sharks/rays) using observer data. Free-school set tuna bycatch typically comprises small volumes of bullet tuna, frigate tuna and kawakawa (tunny). Overall bycatch of tunas amounted to 9.3t per 1000 t of landed tuna (equivalent to <1% of tuna catch) for the EU Indian Ocean purse seine fleet. Correspondingly, 1.5t of bony fish, 0.4 t of billfish, 0.3t of

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
		sharks and 0.2t of rays were captured for every 1000 t landed tuna. A total of 55 different bony fish species were captured, 93 % of which (by weight and number) were taken in the FAD fishery (not being considered here). Bycatch of billfish comprised six main species – black marlin, striped marlin, blue marlin, Indo-pacific sailfish, swordfish and shortbill spearfish. Of the total estimated billfish catch, approximately two thirds is made by the FAD fishery meaning that of the estimated 148 tonne total billfish biomass captured, some 50 t were captured by the free-school fishery over the period (approximately 10-12t per year, equivalent to approximately 400kg of billfish per 1000t landed tuna). The corresponding figure for ray bycatch is 0.2t/1000t landed tuna. The main species encountered were pelagic stingray, giant manta, Chilean devil ray, devilfish and spine tail mobula. Shark bycatch for the period is estimated at 300kg per 1000t landed tuna. Oceanic white tip and silky shark accounted for 94% of landings by number and 90% by weight. Other species present included short-fin mako, blue shark, dusky shark and scalloped hammerhead shark. Apart from the tuna species, little information is available in relation to the status of most if not all of the populations referred to by Amande *et al* (2008) and they are considered data deficient therefore in the context of the MSC assessment. As described earlier in the report, there are few opportunities to sort catch once it comes aboard. For the purposes of this assessment, almost all species indicated by Amande et al (2008) as being captured in EU Indian Ocean purse seine tuna fisheries have been considered under the retained species criterion. Exceptions are whale shark, turtles and manta rays, all of which have been scored under the ETP criterion. The rates of bycatch for the free-school fishery are considered very low in comparison to the FAD based fishery and exceptionally low when compared to other fishing methods such as longline. Implications of bycatch in the free-school fishery for populations of species teleost fish, billfish, rays and sharks identified above are considered insignificant and therefore negligible, on account of the low rates of capture. Also, some species (especially teleost fish) are highly fecund and have short life spans meaning that populations are likely to be robust to fishing pressure. Some of the above species/species groups are vulnerable at population level to fishing impacts. Such species include billfish (marlins in particular), some shark species (silky and oceanic white tip) as well as rays – mantas and mobula rays in particular. However, indicated rates of interaction with the most vulnerable of these (some billfish species, silky and oceanic white tip shark) are sufficiently low in the free-school fishery so as to consider bycatch in the freeschool fishery not to be a threat to populations. Despite this, the assessment process decided on a precautionary approach and implemented the MSC RBF during the site visit in respect of data deficient retained species. During the process that included four stakeholder consultations, silky shark was identified as the most vulnerable data deficient scoring element and Silky shark has therefore been considered as a main retained species. A qualitative risk assessment was carried out using Scale Intensity Consequence Analysis (SICA). SICA indicated a most plausible worst-case scenario SICA score of 2 for silky shark. According to Table CC14 of the CR, this equates to an MSC score of 80 for retained catch of silky shark in the freeschool fishery. According to CR v1.3, all scoring elements for the main retained species including yellowfin and skipjack tuna, and silky shark meet with SG 80 that is the main retained species are highly likely to be within biologically based limits, and therefore a score of 80 is awarded for this issue of PI 2.1.1. Scoring at SG100 is not indicated due to uncertainties with respect to main retained species stock status and undefined reference points.		
b	**Guidepost**			Target reference points are defined for retained species.
	Met?			No
	Justification	Target reference points are not defined for all retained species therefore SG100 cannot be met.		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Yes	Yes	
	Justification	Main retained tuna species are all within biologically based limits. Stock status for Indian Ocean yellowfin tuna and skipjack tuna are both within biologically based limits. Therefore, this issue is determined to meet the requirements of SG 60 and 80. Bycatch of silky shark scores 80 using SICA qualitative risk based analysis. EU purse seine vessels reportedly release sharks when they are captured, although it is likely that this is not always possible and does not always happen. Poisson *et al* (2011) discusses capture of shark species on EU purse seine vessels. An analysis of discarded sharks noted that there was a mortality rate after release of up to 50% up to15 days after capture. It is likely that the mortality rate of silky sharks from this fishery is negligible relative to the mortality rate fin tuna longline fisheries and from targeted shark fisheries. It is unlikely therefore that the purse seine free school fishery plays a significant role in terms of recovery and or rebuilding.		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Yes		
	Justification	Stock status is known for main retained species. SICA analysis has estimated the MSC equivalent score for the most vulnerable data deficient species (silky shark) to be 80.Therefore this issue is determined to meet the requirements of SG 60.		
References		» Dagorn L, Holland KN, Restrepo V, Moreno G. 2013. Is it good or bad to fish with FADs? What are the real impacts of the use of drifting FADs on pelagic marine ecosystems? Fish and Fisheries. 14(3): 391-415. » Poisson F., Vernet A.L., Filmalter J.D., Goujon M., Dagorn L. 2011. Survival rate of silky sharks (*Carcharhinus falciformis*) caught incidentally onboard French tropical purse seiners. IOTC-20110WPEB07-28 » Amande, M.J., Ariz, J., Chassot, E. et al. (2008) Bycatch and discards of the European purse seine tuna fishery in the Indian Ocean: Characteristics and estimation for the 2003-2007 period. Indian Ocean Tuna Commission document, IOTC-2008-WPEB-12, 23 pp. » Echebastar S.A. catch data 2008-2011, Western Indian Ocean tuna fishery » Chavance, P., Amande, J.M., Pianet, R., Chassot, E. and Damiano, A. 2011. Bycatch and Discards of the French Tuna Purse Seine Fishery during the 2003-2010 Period estimated from Observer data IOTC-2011-WPEB07-23 Rev_1		

PI 2.1.1	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
	» Pianet R., 2006. Analysis of data obtained from observer programmes conducted in 2005 and 2006 in the Indian Ocean on board of French purse seiners. IOTC, WPBE » Delgado de Molina A., Ariz J., Sarralde R., Pallarés P. and J. C. Santana, 2005. Activity of the Spanish purse seine fleet in the Indian Ocean and by-catch data obtained from observer programmes conducted in 2003 and 2004. IOTC-2005-WPBy-13 » Romanov E. V., 2002. By-catch in the tuna purse-seine fisheries of the western Indian Ocean. Fish. Bull.100(1): 90-105 » Sarralde R., Delgado de Molina A., Ariz J. and J. C. Santana, 2006. Data obtained from purse-seine observers carry out by the Instituto Español de Oceanografía from the National Database Plan between 2003 and 2006. IOTC-2006-WPTT-07 » Report of the Fifteenth Session of the IOTC Working Party on Tropical Tunas IOTC–2013–WPTT15–R[E]
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 2.1.2 All UoCs

PI 2.1.2		**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Yes	Yes	No

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species
	Justification	The CR v1.3 defines a partial strategy as 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.".* At IOTC level, there are a number of measures in place which are expected to help ensure stocks of all tunas remain at levels that are highly likely to be within biologically based limits. Measures in place include: » Adoption of an interim harvest strategy including interim target and limit reference points » Stock assessment relative to reference points » Effort limitation (through restriction on entry/limitation of fishing capacity) » Implementation of additional conservation and management measures » Adoption of the precautionary approach in IOTC management of tunas » IOTC Resolution 13/06 on a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries » A management strategy evaluation for IOTC tuna stocks, is underway beginning with albacore tuna. MSE is eventually expected to lead to the adoption of a clear harvest strategy and harvest control rules for IOTC stocks. » Echebastar company policy with respect to bycatch reduction, reporting and sustainability which includes carrying out research aimed at allowing escapement of unwanted species from purse seines through technical measures and facilitating the carriage of observers from SFA . Formal recognition of reference points and harvest controls is now in place in the IOTC following the adoption of Resolution 12/01 implementing the Precautionary Approach for managing tuna species in the Indian Ocean. The approach to the IOTC tuna harvest strategy is detailed in the resolution and the resolution further outlines the expectations of IOTC in the context of the development and use of MSY based reference points. In addition, it is expected that future management of tunas will take place in the context of HCR's currently under development through the MSE process that has commenced. In the meantime, while HCRs are still under development, the existing harvest strategy that comprises interim reference points, recent management framework improvements together with improved monitoring and stock biomass assessment is likely to achieve management objectives based on maintaining stock biomass above interim reference points in the immediate future. Resolution 13/10 adopts agreed MSY-based interim target and limit reference points as shown below: **Table 1**. Interim target and limit reference points. Stock — Target Reference Point — Limit Reference Point Albacore — B_{MSY}; F_{MSY} — $B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$ Bigeye tuna — B_{MSY}; F_{MSY} — $B_{LIM} = 0.50\ B_{MSY}$; $F_{LIM} = 1.30\ F_{MSY}$ Skipjack tuna — B_{MSY}; F_{MSY} — $B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.50\ F_{MSY}$ Yellowfin tuna — B_{MSY}; F_{MSY} — $B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$ Swordfish — B_{MSY}; F_{MSY} — $B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$ Source: IOTC Resolution 13/10 In all cases, BMSY refers to the biomass level for the stock that would produce the Maximum Sustainable Yield; FMSY refers to the level of fishing mortality that produces the Maximum Sustainable Yield. In order to achieve the overall objective of establishing reference points and harvest control measures for major Indian Ocean tuna species the Working Party on Methods has formulated a work programme for undertaking Management Strategy Evaluations (MSE). The MSE is underway with respect to albacore tuna and once completed will be repeated for all other stocks beginning with skipjack tuna. Ultimately it is expected that the current interim tuna management framework will be replaced with a harvest strategy and formally adopted HCR's. This will take some time however the steps in the process have been laid out and there is clear commitment to following this path in future.

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species
		Council Regulation (EC) No 520/2007 lays down technical measures for the conservation of certain stocks of highly migratory species. Under Article 19 Member States shall do their utmost to encourage the release of live sharks caught accidentally, in particular juveniles. Member States shall also encourage the reduction of discards of sharks. IOTC Resolution 13/06 entered into force in November 2013. The resolution requires IOTC members to prohibit, as an interim pilot measure, all fishing vessels flying their flag and on the IOTC Record of Authorised Vessels, or authorised to fish for tuna or tuna-like species managed by the IOTC on the high seas to retain onboard, tranship, land or store any part or whole carcass of oceanic whitetip sharks. Furthermore, IOTC member vessels fishing on the high seas are required to promptly release unharmed, to the extent practicable, oceanic white tip sharks. Contracting party vessels are also required to encourage their fishers to record incidental catches as well as live releases of oceanic white tip shark. Contracting parties are also encouraged to undertake research into oceanic white tip sharks in the IOTC area and are further encouraged to engage in scientific data collection using observers. Other management measures in place relate to recording of catch and effort data by fishing vessels in the IOTC area (Resolution 13/03); Resolution 13/11 on a ban on discards of bigeye, skipjack and yellowfin tuna and a recommendation for non-target species caught in the IOTC area by purse seine vessels; Resolution 12/12 On the implementation of a limitation on of fishing capacity; Resolution 12/12 to promote the implementation of conservation and management measures already adopted by IOTC; Resolution 13/06 on a scientific and management framework on the conservation of shark species captured in association with IOTC managed fisheries and Resolution 10/11 on port state measures to prevent, deter and eliminate IUU fishing. At EU/national (Spain and Seychelles) level, a comprehensive system of management measures are in place with respect to vessel licensing and permitting, catch reporting, landings restrictions, observer coverage, ban on shark finning, VMS as well as spatial limitations/temporal restrictions. While elements of the harvest strategy are still under development (principally a HCR) the measures already adopted and in place are considered. Echebastar group are proactively carrying out research and investigations in an attempt to reduce or eliminate as much unwanted catch from tuna sets as possible. Echebastar also operate on board procedures that are intended to ensure unwanted catch of retained tuna and other species is minimised and that large captured specimens such as sharks, mantas and turtles are removed from the purse seine or brailer at the earliest opportunity according to written guidelines. Research into bycatch in the purse seine fishery was carried out by Echebastar in collaboration with Grupo de Investigacion en Biodiversidad y Conservacion, Universidad de Las Palmas de Gran Canaria during 2013. A technical report (Garcia et al, 2013) has been provided to the team. The report is based on observer data for bycatch in 168 hauls (7 of which were based on freeschool sets) carried out during February/March 2013. Some useful data are generated in relation to freeschool set bycatch, while an important objective of the study was also to train crew in the use of good practices to reduce the mortality of sharks and other animals captured incidentally by purse seiners, according to the guidelines contained in Poisson *et al (*2012). A further study in which Echebastar group is a partner (Anon, 2013) investigates possible bycatch mitigation measures in the tropical tuna purse seine fishery. Further research is planned and during October 2013 Echebastar group were confirmed to be in in receipt of significant research aid in order to develop a prototype selectivity device for use in purse seine tuna fisheries. Therefore, for the main retained species, including bigeye, yellowfin and skipjack tuna, and silky shark, the assessment team believes that here are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding, so the fishery meets the requirements of the SG 60 level for this scoring issue, Further, that there is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding, so the fishery meets the requirements of the SG 80 level for this scoring issue. However the assessment team has determined that there is not a full strategy in place for the main retained species, so the fishery does not meet the SG 100 level for this scoring issue.

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
b	Guidepost	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 partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Yes	Yes	No
	Justification	The partial strategy is focused on developing enhanced harvest strategies based on best practice in management of tuna stocks. Development of the harvest strategy is underpinned by consensus amongst contracting parties that is reflected in the introduction of a number of new resolutions aimed at enhancing management. The partial strategy is further supported by appropriate science and improved data collection in relation to how the fishery operates, including total removals. Interim harvest strategies have maintained stocks within biologically based limits and enhanced strategies are therefore likely to build on existing management and introduce formal measures such as a HCR and appropriate reference points for each stock. Therefore the assessment team believes that the measures are considered likely to work, based on plausible argument, so the fishery meets the minimum requirements for the SG 60 level for this scoring issue, Further that there is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved, so the fishery meets the requirements of the SG 80 level for this scoring issue, However, there is no evidence that testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved, so the fishery does not meet the SG 100 level for this scoring issue.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Yes	No

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
	Justification	Bigeye, yellowfin and skipjack tuna stocks are all currently at or above interim target and limit reference points. Latest IOTC evaluations suggest that bigeye, yellowfin and skipjack tuna are not overfished or are being subject to overfishing. While the current harvest strategy is an interim one, there is clear evidence that stocks are being maintained above biologically based limits. IOTC contracting parties are committed to enhanced tuna stock management. The MSE proposed under resolution 13/10 is already underway and stock specific robust reference points are under review within the scientific committee. Several important new resolutions have been adopted by the IOTC in the last number of sessions (especially since 2011) that aim to strengthen and expand the scope of management of Indian Ocean stocks for which IOTC is the responsible RFMO. The most important of these relates to the adoption of the Precautionary Approach and the resolution commits contracting parties to develop enhanced harvest strategies and HCR's. Current MSE that is underway in respect of albacore tuna has been interpreted as evidence of implementation of the partial strategy. In addition additional measures have been adopted through resolutions that specifically aim to manage impacts of tuna fisheries on a number of vulnerable species groups, including sharks, whale sharks, cetaceans and turtles. Growing support for enhanced management and agreement between contracting parties on implementation of a swathe of new resolutions is seen as evidence of growing commitment to improve Indian Ocean tuna stock management as well as impacts on non-target stocks/species. Adoption of resolutions is a basis for confidence that strategies (which have been designed to manage impacts) will ultimately work as they will have been agreed by and apply to all contracting parties. Adoption of resolutions further demonstrates co-operation, agreement and commitment amongst contracting parties to ensuring future sustainability of the fisheries. Therefore, the assessment believes that there is some evidence that the partial strategy is being implemented successfully, so the fishery meets the SG 80 level for this scoring issue. However the SG 100 is not considered to be met with as the management is considered to be a partial strategy and there has been no specific testing carried out.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			No
	Justification	There is a partial strategy in place. There are significant shortcomings in this, principally by way of the lack of a harvest control rule. While MSE is underway for some stocks it will take some time for this to be completed for all stocks and to bring management of retained species to a point where it meets with CR requirements for a strategy. Therefore the fishery does not meet the SG100 level for this scoring issue.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Yes	Yes	No

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species
	Justification	It is considered highly likely that shark finning is not taking place. Echebastar group policy explicitly does not permit shark finning. Evidence was provided to the assessment team from Seychellois fisheries officers as well as by Spanish officials to support the company claim that shark finning does not occur in this fishery. In practical terms there are limited opportunities for shark finning to take place while at sea and any sharks returned to the sea are returned directly from the brailer prior to catches entering the hopper. Once retained catches have entered chill tanks, no further access is possible until sharks are discharged from the tanks on landing. Increased onboard observer coverage (100% of all effort) introduced by Echebastar during 2014 is considered to be a level of observer coverage that is capable of detecting whether shark finning is occurring. Shark finning is illegal on EU registered vessels and in the Seychelles the Fisheries (Shark Finning) Regulations 2006 forbids the practice of finning by foreign vessels licensed to operate in Seychelles EEZ by requiring vessels to land fin to the quantity of no more than 5% of the mass of dressed shark carcass. The feasibility/effectiveness of the enforcement of this regulation has yet to be assessed. The assessment team believes that it is likely that shark finning is not taking place, so the fishery meets the SG 60 level for this scoring issue. Further that It is highly likely that shark finning is not taking place, so the fishery also meets the SG 80 level for this scoring issue. Hhowever, there is not a high degree of certainty that shark finning is not taking place, so the fishery does not meet the SG 100 level for this scoring issue.
References		» Anon, 2013. Study of possible mitigation measures in the tropical tuna purse seine fishery. Technical report, September 2013. AZTI Tecnalia. » Garcia, V.H., Hernandez, J.J.C. and Ortega, A.T.S 2013. Analysis of incidental catches in the tuna fishery developed by the Pesqueras Echebastar on freeschools or tuna associated with FADs in the Indian Ocean: quantification and prevention actions. Technical Report from the University of Las Palmas Gran Canaria to Echebastar group. » Fisheries (Shark Finning) Regulations 2006, Seychelles Fisheries Act 1987. » http://www.iotc.org/documents/compendium-active-iotc-conservation-and-management-measures (Compendium of Active Conservation and Management Measures for the Indian Ocean Tuna Commission) » IOTC Resolution 13/10 On interim target and limit reference points and a decision framework » IOTC Resolution 12/13 for the conservation and management of tropical tuna stocks in the IOTC area of competence » IOTC 12/01 on the implementation of the precautionary framework » IOTC Resolution 13/06 On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries » Report of the Fifteenth Session of the IOTC Working Party on Tropical Tunas IOTC–2013–WPTT15–R[E] » COUNCIL REGULATION (EU) No 40/2013 of 21 January 2013 fixing for 2013 the fishing opportunities available in EU waters and, to EU vessels, in certain non- EU waters for certain fish stocks and groups of fish stocks which are subject to international negotiations or agreements » Council Regulation (EC) No 520/2007 of 7 May 2007 laying down technical measures for the conservation of certain stocks of highly migratory species and repealing Regulation (EC) No 973/2001 » Poisson, F., Vernet, A.L. and Dagorn, L. 2012. Good practices to reduce the mortality of sharks and rays caught incidentally by the tropical tuna purse seiners. EU FP7 project 210496 MADE, deliverable 6.2.
OVERALL PERFORMANCE INDICATOR SCORE:		**80**

PI 2.1.2	There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species
CONDITION NUMBER (if relevant):	

Evaluation table for PI 2.1.3 All UoCs

PI 2.1.3		**Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Yes	Yes	No

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species
	Justification	Qualitative information on the amount of retained species is available from Echebastar group in relation to UoC vessels directly. IOTC Resolution 12/03 on the recording of catch and effort data by vessels fishing in the IOTC area (since superseded by Resolution 13/03) requires the recording of catch and effort data by all vessels and for purse seine vessels as outlined under Annexes I and II. Primary fishing data (location, date, time, set type FAD/non-FAD) and catch (kg) of primary species (tunas) must be recorded by set, while catch of other species grouped by turtles, marine mammals, whale sharks, thresher sharks and oceanic white tip sharks must also be recorded. This information must be provided to the flag state of the vessels (Spain, Seychelles) as well as the coastal state administration where the vessels have fished in those countries EEZ. Data must in turn be provided in aggregated format to IOTC secretariat by June 30th each year for the previous year's operation. Information collected is mainly qualitative in relation to retained species – although data may also be quantitative if implemented fully. However, full implementation requires reporting of all bycatch by individual set which is difficult to carry out as the fishing operation does not allow for meaningful sorting of catch. Some useful qualitative data is generated by the implementation of the resolution. Recording of bycatch (total kg, all species) is also provided for in onboard "diarios" on Echebastar group vessels. Data generated is mainly qualitative and little useful quantitative data appears to be generated by this measure – again this is likely to be related to the inability to sort the bulk catch when it comes aboard. Port sampling of discharged catch is carried out by officers of the Seychelles Fishing Authority, and is required under resolution 10/11 on port state measures to prevent, deter and eliminate IUU fishing. Under the resolution, contracting parties are required to carry out inspections of 5% of landings or transhipments in its ports annually. Inspections are required to monitor the entire discharge or transshipment and compare quantities by species recorded in the prior notice of landing and the quantities by species landed or transhipped. Again, this requirement is not likely to generate much by way of useful quantitative information, as the initial recording of retained species catch is problematic as has been described. Under IOTC resolution 11/04, a regional observer scheme has been established. The objective of the IOTC observer scheme is to collect verified catch data and other scientific data related to the fisheries for tuna and tuna-like species in the IOTC area of competence. The scheme aims to improve the collection of scientific data and applies to all vessels <24m fishing in the IOTC area. At least 5 % of the number of operations/sets for each gear type for each contracting party must be covered. In this regard, Echebastar group have signed a Memorandum of Understanding with the Seychelles Fishing Authority concerning the carrying of observers and evidence presented to the assessment team by SFA and Echebastar group indicated that the scheme was up and running as of September 32013. The functions of the observer scheme includes to "observe and estimate catches as far as possible with a view to identifying catch composition and monitoring discards, by-catches and size frequency". While only recently implemented, the scheme was in place within the fishery and is expected to yield both qualitative and quantitative results in relation to retained catch in time through observer reports of monitoring of retained catch. Additional research into bycatch in the purse seine fishery was carried out by Echebastar in collaboration with Grupo de Investigacion en Biodiversidad y Conservacion, Universidad de Las Palmas de Gran Canarias during 2013. A technical report (Garcia et al, 2013) has been provided to the team. The report is based on observer data for bycatch in 168 hauls (7 of which were based on freeschool sets) carried out during February/March 2013. Some useful data are generated in relation to freeschool set bycatch, while an important objective of the study was also to train crew in the use of good practices to reduce the mortality of sharks and other animals captured incidentally by purse seiners, according to the guidelines contained in Poisson *et al* 2012. Resolution 10/02 on mandatory statistical requirements for IOTC members provides and outlines requirements for recording and submission of catch and effort data. The provisions, applicable to tuna and tuna-like species, are also applicable to the most commonly caught shark species and, where possible, to the less common shark species. CPC's are also encouraged to record and provide data on species other than sharks and tunas taken as bycatch.

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
		Significant additional data is available through published studies and reports e.g. reports of the IOTC Working Party on Ecosystems and Bycatch (WPEB), Amande *et al* (2008), Chavance *et at* (2011), Delgado de Molina *et al* (2005), Romanov (2005), Pianet (2006) and Sarralde *et al* (2006) that analyse and present the results of observer programmes required by European data collection regulations on EU Indian Ocean tuna fleets from 2003-2010 and for other fleets. The studies provide detailed information on retained catches and discarding by the purse seine fleet and have provided the main basis for the evaluation of retained species performance indicator in the current assessment. These studies are considered still to be relevant despite being a number of years old. Therefore the assessment team believes that qualitative information is available on the amount of main retained species taken by the fishery, so the fishery meets the SG 60 level for this scoring issue, Further, that qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery, so the fishery meets the SG 80 level for this scoring issue. However, accurate and verifiable information is not available on the catch of all retained species and the consequences for the status of affected populations, so the fishery does not meet the SG 100 level for this scoring issue.		
.b	Guidepost	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Yes	Yes	No
	Justification	Catch data are collected in relation to all tunas landed or transhipped. Pesqueras Echebastar operates an onboard logbook in which incidents of slippage of unwanted tuna catches are recorded and reported (IOTC Resolution 13/03). Data is verified during discharge or transhipment in Port Victoria by SFA Inspectors. For tuna species affected by the fishery, good information is available in relation to catch, stock status, seasonal and temporal operation of the fishery, size-frequency of landed catches and biology of affected species. Some understanding of discarding of unwanted catches and the effect of this on populations also exists. Available information supports the estimation of stock status with respect to biologically based limits in the form of interim limit reference points. According to the RBF (CC3.7.1) If there are both data-deficient (RBF) and non-data-deficient scoring elements in PI 2.1.1, the CAB shall score the Scoring issue in brackets in Table CB10, but shall only consider the non-data-deficient scoring elements when scoring the Scoring issue in bracket. The assessment team believes that information is both adequate to qualitatively assess and is sufficient to estimate outcome status with respect to biologically based limits, so the fishery meets the requirements of the SG 60 and 80 levels for this scoring issue. However, information is not sufficient to quantitatively estimate outcome status with a high degree of certainty, so the fishery does not meet the requirements of the SG100 level for this scoring issue.		
c	Guidepost	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Yes	No	No

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
	Justification	Information is considered adequate in relation to retained tuna catch and supports a partial strategy to manage impacts on bigeye, yellowfin and skipjack tuna. Both silky shark and oceanic white tip shark are known to feature as bycatch in the fishery. Both species are considered vulnerable to population impacts through bycatch in commercial fisheries. Recent collection of information on catches of these species does not support ongoing management of the stocks of both shark species and is not adequate to fully understand and monitor the impact that the freeschool fishery may be having on bycaught shark species. While the fishing operation does not allow for accurate catch sorting, there are opportunities for improving the recording of data in relation to bycatch of sharks (and other species) in particular. It is considered that this should be carried out in order to improve understanding of the impact of the fishery on Indian Ocean shark populations. Recent initiatives at IOTC level may lead to greater levels of information in the future and additional data in relation to shark bycatch may become available as a result of implementation of IOTC Resolution 13/06 on a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries. The assessment team believes that information is adequate to support measures to manage main retained species, so the fishery meets the SG 60 level for this scoring issue, However the team believes that information is not adequate to support either partial or full strategy to manage main retained species, so the fishery does not meet the requirements of the SG 80 or 100 levels for this scoring issue.		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Yes	No
	Justification	A wide range of data continue to be collected in relation to the operation of the fishery. Data is recorded in relation to catches of tuna species by different fleets and gear types, landings/transshipments, spatial and temporal operation of the fishery including fishing effort (through VMS), size frequency of catches and bycatch levels. A wide range of oceanographic (physical/biological/chemical) environmental data are also collected for the Indian Ocean by many contracting party nations. Fishing capacity of IOTC contracting parties is also monitored by IOTC and contributes to the understanding of risk levels on an ongoing basis.In the future, additional data in relation to shark bycatch may become available as a result of implementation of IOTC Resolution 13/06. The assessment team believes that sufficient data continues to be collected to detect any increase in risk level, so the fishery meets the SG 80 level for this scoring issue. However, monitoring of retained species is not conducted in sufficient detail to assess ongoing mortalities to all retained species, so the fishery does not meet the requirements of the SG 100 level for this scoring issue.		
References		» Anon, 2013. Study of possible mitigation measures in the tropical tuna purse seine fishery. Technical report, September 2013. AZTI Tecnalia. » Garcia, V.H., Hernandez, J.J.C. and Ortega, A.T.S 2013. Analysis of incidental catches in the tuna fishery developed by Pesqueras Echebastar on freeschools or tuna associated with FADs in the Indian Ocean: quantification and prevention actions. Technical Report from the University of Las Palmas Gran Canaria to Echebastar group. » http://ec.europa.eu/research/bioeconomy/pdf/ebfmtuna2012_boa_draft26092012.pdf (Mitigating impacts of fishing on pelagic ecosystems: towards ecosystem-based management of tuna fisheries Draft book of Abstracts 15-18 October 2012 Montpellier – France)		

PI 2.1.3	Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species
	» IOTC Report of the Ninth Session of the Working Party on Ecosystems and Bycatch IOTC–2013–WPEB09–R[E] » Pianet R., 2006. Analysis of data obtained from observer programmes conducted in 2005 and 2006 in the Indian Ocean on board of French purse seiners. IOTC, WPBE » Delgado de Molina A., Ariz J., Sarralde R., Pallarés P. and J. C. Santana, 2005. Activity of the Spanish purse seine fleet in the Indian Ocean and by-catch data obtained from observer programmes conducted in 2003 and 2004. IOTC-2005-WPBy-13 » Romanov E. V., 2002. By-catch in the tuna purse-seine fisheries of the western Indian Ocean. Fish. Bull.100(1): 90-105 » Sarralde R., Delgado de Molina A., Ariz J. and J. C. Santana, 2006. Data obtained from purse-seine observers carry out by the Instituto Español de Oceanografía from the National Database Plan between 2003 and 2006. IOTC-2006-WPTT-07 » Amande, M.J., Ariz, J., Chassot, E. et al. (2008) Bycatch and discards of the European purse seine tuna fishery in the Indian Ocean: Characteristics and estimation for the 2003-2007 period. Indian Ocean Tuna Commission document, IOTC-2008-WPEB-12, 23 pp. » Echebastar S.A. catch data 2008-2011, Western Indian Ocean tuna fishery » Chavance, P., Amande, J.M., Pianet, R., Chassot, E. and Damiano, A. 2011. Bycatch and Discards of the French Tuna Purse Seine Fishery during the 2003-2010 Period estimated from Observer data IOTC-2011-WPEB07-23 Rev_1 » IOTC Resolution 11/04 on a regional observer scheme. IOTC Resolution 13/03 on the recording of catch and effort data by fishing vessels in the IOTV area of competence » IOTC Resolution 10/11 on port state measures to prevent, deter and eliminate IUU fishing » IOTC Resolution 13/06 On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries » IOTC Resolution 10/02 Mandatory statistical requirements for IOTC members

OVERALL PERFORMANCE INDICATOR SCORE:	**75**
CONDITION NUMBER (if relevant):	**7**

Evaluation table for PI 2.2.1 All UoCs

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Yes	Yes	Yes
	Justification	The CR (v1.3) defines bycatch species as species that are not retained. The fishery retains specimens of all species that are encountered during fishing operations and evidence has been provided to the assessment team to support this. The only species that are generally not retained in gear are large and/or charismatic species such as whaleshark, manta rays, turtles and cetaceans, although they may be injured or suffer mortality as a result of interactions. However, all of these have been considered under the ETP Criterion. Since some specimens of all shark species captured are likely to be retained, shark species have been considered under retained species. There are very few opportunities to sort catch and none of these are sufficient to allow all specimens of a species to be removed from the catch and discarded or returned alive. Therefore, the assessment has concluded that there are no bycatch species. Purse seine fishing on freeschool tunas is highly unlikely to give rise to significant unrecorded mortality (i.e. mortality of species NOT landed) of any species and general information supports the understanding that there is no significant bycatch mortality of seabirds in high seas tuna freeschool sets and that associated impacts are therefore negligible. As there are no bycatch species, the fishery meets with SG 100 requirement for this scoring issue		
b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Yes	Yes	
	Justification	There are no bycatch species.		

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**		
c	**Guidepost**	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Yes		
	Justification	There are no bycatch species.		
References		» Amande, M.J., Ariz, J., Chassot, E. et al. (2008) Bycatch and discards of the European purse seine tuna fishery in the Indian Ocean: Characteristics and estimation for the 2003-2007 period. Indian Ocean Tuna Commission document, IOTC-2008-WPEB-12, 23 pp. » Echebastar S.A. catch data 2008-2011, Western Indian Ocean tuna fishery » Chavance, P., Amande, J.M., Pianet, R., Chassot, E. and Damiano, A. 2011. Bycatch and Discards of the French Tuna Purse Seine Fishery during the 2003-2010 Period estimated from Observer data IOTC-2011-WPEB07-23 Rev_1		

OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 2.2.2 All UoCs

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Yes	Yes	No

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations
	Justification	There are no bycatch species in the fishery. Despite this, there are a range of measures that are considered to represent a partial strategy to manage impacts. The CR v1.3 defines a partial strategy as 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.".* At IOTC level, there are a number of measures in place which are expected to help ensure incidentally captured species remain at levels that are highly likely to be within biologically based limits or that the fishery does not hinder recovery and./or rebuilding. Additional measures are in place amongst relevant flag states (Spain, Seychelles) as well as within the Echebastar group. Measures in place include: » Adoption of an interim harvest strategy including interim target and limit reference points » Stock assessment relative to reference points » Effort limitation (through restriction on entry/limitation of fishing capacity) » Implementation of additional conservation and management measures » Adoption of the precautionary approach in IOTC management of tunas » IOTC Resolution 13/06 on a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries » A management strategy evaluation for IOTC tuna stocks, is underway beginning with albacore tuna. MSE is eventually expected to lead to the adoption of a clear harvest strategy and harvest control rules for IOTC stocks. » Echebastar company policy with respect to bycatch reduction, reporting and sustainability which includes carrying out research aimed at allowing escapement of unwanted species from purse seines through technical measures and facilitating the carriage of observers from SFA in future IOTC Resolution 13/06 entered into force in November 2013. The resolution requires IOTC members to prohibit, as an interim pilot measure, all fishing vessels flying their flag and on the IOTC Record of Authorised Vessels, or authorised to fish for tuna or tuna-like species managed by the IOTC on the high seas to retain onboard, tranship, land or store any part or whole carcass of oceanic whitetip sharks. Furthermore, IOTC member vessels fishing on the high seas are required to promptly release unharmed, to the extent practicable, oceanic white tip sharks. Contracting party vessels are also required to encourage their fishers to record incidental catches as well as live releases of oceanic white tip shark. Contracting parties are also encouraged to undertake research into oceanic white tip sharks in the IOTC area and are further encouraged to engage in scientific data collection using observers. Other management measures in place relate to recording of catch and effort data by fishing vessels in the IOTC area (Resolution 13/03); Resolution 13/11 on a ban on discards of bigeye, skipjack and yellowfin tuna and a recommendation for non-target species caught in the IOTC area by purse seine vessels; Resolution 12/12 On the implementation of a limitation on of fishing capacity; Resolution 12/12 to promote the implementation of conservation and management measures already adopted by IOTC; Resolution 13/06 on a scientific and management framework on the conservation of shark species captured in association with IOTC managed fisheries and Resolution 10/11 on port state measures to prevent, deter and eliminate IUU fishing. At EU/national (Spain and Seychelles) level, a comprehensive system of management measures are in place with respect to vessel licensing and permitting, catch reporting, landings restrictions, observer coverage, ban on shark finning, VMS as well as spatial limitations/temporal restrictions. Council Regulation (EC) No 520/2007 lays down technical measures for the conservation of certain stocks of highly migratory species. Under Article 19 Member States shall do their utmost to encourage the release of live sharks caught accidentally, in particular juveniles. Member States shall also encourage the reduction of discards of sharks.

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
		Research into bycatch in the purse seine fishery was carried out by Echebastar in collaboration with Grupo de Investigacion en Biodiversidad y Conservacion, Universidad de Las Palmas de Gran Canaria during 2013. A technical report (Garcia et al, 2013) has been provided to the team. The report is based on observer data for bycatch in 168 hauls (7 of which were based on freeschool sets) carried out during February/March 2013. Some useful data are generated in relation to freeschool set bycatch, while an important objective of the study was also to train crew in the use of good practices to reduce the mortality of sharks and other animals captured incidentally by purse seiners, according to the guidelines contained in Poisson *et al (*2012). A further study in which Echebastar group is a partner (Anon, 2013) investigates possible bycatch mitigation measures in the tropical tuna purse seine fishery. Further research is planned and during October 2013 Echebastar group were confirmed to be in in receipt of significant research aid in order to develop a prototype selectivity device for use in purse seine tuna fisheries. Echebastar also operate on board procedures that are intended to ensure unwanted catch of retained tuna and other species is minimised and that large captured specimens such as sharks, mantas and turtles are removed from the purse seine or brailer at the earliest opportunity according to written guidelines. The measures however fall short of being considered a full strategy as all species captured are retained even though many of these are of little or no economic benefit to Echebastar group. Therefore the assessment tea has detrmined that there are both measures and a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding, thuse meetingthe requirements of the SG60 and 80 levels. There is not however a complete strategy in place for managing and minimizing bycatch, so the fishery does not meet the requirements of the SG 100 level.		
b	**Guidepost**	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 partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Yes	Yes	No

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
	Justification	Freeschool sets for Indian ocean tunas generally result in bycatch levels that are significantly less than 2% of bulk catches. Under current practice, all catch is retained apart from the largest specimens of species such as sharks, rays and turtles. Overall risks to bycatch species from purse seine sets on freeschool sets are low when compared to other means of fishing. Management of impacts of the fishery is subject to increasing attention through IOTC and significant developments have been made in the context of resolutions aimed at dealing with issues related to wider environmental impacts. Ultimately, as contracting parties, it is for flag states (in this case Spain – through the EU, and Seychelles) however to implement the requirements of IOTC resolutions. Evidence provided to the assessment team by the Spanish Ministry for Agriculture, Food and Environment suggests that both the EU and Spain are committed to implementation of all measures required under IOTC resolutions as contracting parties to the IOTC. Preliminary investigations into selectivity windows fitted to purse seine gears in fishing trials conducted by Echebastar group indicate potential for release of significant quantities of unwanted bycatch. The project is ongoing and is in receipt of significant funding for a programme of research in order to develop a prototype escapement panel that will allow the exit of unwanted catches from purse seine gears. The observed low level of bycatch associated with the freeschool fishery and knowledge in relation to many bycatch species (which suggests that the great majority of bycatch by weight and number of bycatch is comprised of fast growing short lived species) together with Echebastar demonstrated commitment to reducing impacts further provides an objective basis for confidence that the strategy will work. Based on the evidence presented above, the assessment team believes that there is both measures that are considered likely to work and based on plausible argument some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved, therefore the fishery meets the requirements of the SG 60 and 80 levels. It is clear however that there is no evidence that testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved, so the fishery does not meet the requirements of the SG 100.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Yes	Yes
	Justification	Overall incidental capture of unwanted species in freeschool purse seine sets in the Indian ocean amounts to less than 2% of bulk catches. This has been interpreted by the team as clear evidence that the strategy of making sets on freeschools of tuna successfully minimizes bycatch both within purse seine operations (as opposed to purse seine sets on FADs) but also when compared to other means of fishing such as long line. While most of these are retained and are not considered to be bycatch species, it is considered that opportunities could be created to sort catches in future in which case there would be an incentive to further reduce the incidence of accidental capture and reduce or eliminate bycatch of many species. Other evidence presented to the assessment team included confirmation that 14 skippers and crew members of Echebastar group attended an *ISSF Bycatch reduction workshop in tuna purse seine FAD fisheries*. While the workshop focused on reduction of bycatch in FAD fisheries, participation is seen as demonstration of commitment to reducing bycatch at fleet level. In addition, members of Echebastar group participated in the EU funded Sukarrieta GAP2 meeting held during 2012 to promote sustainability in Indian ocean tuna fisheries, in addition to participating in a further bycatch mitigation workshop for purse seine skippers held in November 2012. Based on the evidence presented above, the assessment team believes that there is both some evidence that the partial strategy is being implemented successfully, and clear evidence that the strategy is being implemented successfully. Therefore, it was determined that the fishery meets the requirements of the SG 80 and 100 levels.		

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			Yes
	Justification	Some evidence to support the understanding that there are no bycatch species and that levels of retained catch overall are very low in the fishery has been available to the assessment team. Much of the bycatch by way of biomass and numbers of individuals is comprised of fast growing, short lived abundant pelagic species. The fact that these species remain relatively abundant suggests that the strategy might be effective. Some evidence was presented to the team that instances of shark capture do some result in the release of live specimens. There are no recorded landings of large vulnerable species by Pesqueras Echebastar, and shark bycatch is considered minimal in the fishery.Based on the evidence presented above, it was determined that the fishery mets the requirements of the SG 100 level, that is the strategy is achieving its overall objective.		
References		» Anon, 2013. Study of possible mitigation measures in the tropical tuna purse seine fishery. Technical report, September 2013. AZTI Tecnalia. » Garcia, V.H., Hernandez, J.J.C. and Ortega, A.T.S 2013. Analysis of incidental catches in the tuna fishery developed by Pesqueras Echebastar on freeschools or tuna associated with FADs in the Indian Ocean: quantification and prevention actions. Technical Report from the University of Las Palmas Gran Canaria to Echebastar group. » http://www.iotc.org/documents/compendium-active-iotc-conservation-and-management-measures (Compendium of Active Conservation and Management Measures for the Indian Ocean Tuna Commission.) » IOTC Resolution 13/10 On interim target and limit reference points and a decision framework » IOTC Resolution 12/13 for the conservation and management of tropical tuna stocks in the IOTC area of competence » IOTC 12/01 on the implementation of the precautionary framework » IOTC Resolution 13/06 On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries » Report of the Fifteenth Session of the IOTC Working Party on Tropical Tunas IOTC–2013–WPTT15–R[E] » COUNCIL REGULATION (EU) No 40/2013 of 21 January 2013 fixing for 2013 the fishing opportunities available in EU waters and, to EU vessels, in certain non- EU waters for certain fish stocks and groups of fish stocks which are subject to international negotiations or agreements » Council Regulation (EC) No 520/2007 of 7 May 2007 laying down technical measures for the conservation of certain stocks of highly migratory species and repealing Regulation (EC) No 973/2001 » Poisson, F., Vernet, A.L. and Dagorn, L. 2012. Good practices to reduce the mortality of sharks and rays caught incidentally by the tropical tuna purse seiners. EU FP7 project 210496 MADE, deliverable 6.2.		

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 2.2.3 All UoCs

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Yes	Yes	No
	Justification	There are no bycatch species in the fishery. There is good information in relation to the catch of retained species from a number of published sources that are previously referred to. General information and understanding suggests that large species such as turtles, sharks, rays and billfishes are returned to the water where possible. However, the fact that catches of all species are not fully accounted for in catch recording and reporting is considered a weakness and while data are likely to be sufficient to indicate changes in risk, monitoring is not considered to occur in sufficient detail to assess ongoing mortalities to all non-target species. The SG100 scoring guide has therefore not considered to have been met.		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Yes	Yes	No
	Justification	There are no bycatch species in the fishery and all catch has been considered as retained. A limited number of species that are never retained have been considered as ETP species. All other catch is retained. There is no formal procedure in place on Echebastar group vessels for recording all instances of capture and release of large specimens and catch recording and reporting of incidental/non target species in general does not support the scoring guide at SG100 (high degree of certainty).		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Yes	Yes	No
	Justification	Effectively, the fishery retains all species encountered by the gear. Data from focused bycatch studies, EU data collection programmes and a recently implemented IOTC observer programme provides a basis for supporting and evaluating the effectiveness of the partial strategy. However, the fact that there is incomplete recording of catches of non-target species means that information cannot be considered adequate to manage impacts or to evaluate with a high degree of certainty whether the strategy is achieving its objective. In particular, instances of slippage, although likely to be rare may not be recorded. Many species that are taken as bycatch are not assessed and while all of these are currently considered as retained catch, there remains associated uncertainty in respect of the impact of the fishery on incidentally captured species. SG 100 cannot be scored.		

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Yes	No
	Justification	There are no bycatch species, all incidental captures are either retained or are considered under the ETP criterion. A wide range of data continues to be collected in relation to the operation of the fishery. Data is recorded in relation to catches of tuna species by different fleets and gear types, landings/transshipments, spatial and temporal operation of the fishery including fishing effort (through VMS), size frequency of catches and bycatch levels. A range of oceanographic (physical/biological/chemical) environmental data is also collected for the Indian Ocean by many contracting party nations. Fishing capacity of IOTC contracting parties is also monitored by IOTC and contributes to the understanding of risk levels on an ongoing basis. Additional data in relation to shark bycatch is expected to become available as a result of implementation of IOTC Resolution 13/06, however shark bycatch has already been considered under retained species. The fact that catches of all species are not fully accounted for in catch recording and reporting is considered a weakness and while data are likely to be sufficient to indicate changes in risk, monitoring is not considered to occur in sufficient detail to assess ongoing mortalities to all bycatch species (SG100).		
References		» Amande, M.J., Ariz, J., Chassot, E. et al. (2008) Bycatch and discards of the European purse seine tuna fishery in the Indian Ocean: Characteristics and estimation for the 2003-2007 period. Indian Ocean Tuna Commission document, IOTC-2008-WPEB-12, 23 pp. » Echebastar S.A. catch data 2008-2011, Western Indian Ocean tuna fishery » Chavance, P., Amande, J.M., Pianet, R., Chassot, E. and Damiano, A. 2011. Bycatch and Discards of the French Tuna Purse Seine Fishery during the 2003-2010 Period estimated from Observer data IOTC-2011-WPEB07-23 Rev_1 » Anon, 2013. Study of possible mitigation measures in the tropical tuna purse seine fishery. Technical report, September 2013. AZTI Tecnalia. » http://ec.europa.eu/research/bioeconomy/pdf/ebfmtuna2012_boa_draft26092012.pdf (Mitigating impacts of fishing on pelagic ecosystems: towards ecosystem-based management of tuna fisheries Draft book of Abstracts 15-18 October 2012 Montpellier - France) » Garcia, V.H., Hernandez, J.J.C. and Ortega, A.T.S 2013. Analysis of incidental catches in the tuna fishery developed by the Pesqueras Echebastar on freeschools or tuna associated with FADs in the Indian Ocean: quantification and prevention actions. Technical Report from the University of Las Palmas Gran Canaria to Echebastar group. » IOTC Report of the Ninth Session of the Working Party on Ecosystems and Bycatch IOTC–2013–WPEB09–R[E]		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				

Evaluation table for PI 2.3.1 All UoCs

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Yes	Yes	No

	Justification	Both Spain and the Seychelles are signatories of the Convention on international trade in Endangered species of wild flora and fauna (CITES). The present assessment includes 3 EU registered vessels and 3 Seychellois registered vessels. CITES regulations apply to both nations. For all practical purposes Echebastar group apply EU legislation in respect of vessel operations where this is permissible and where no Seychellois legislation or other international convention takes precedent for Seychellois registered vessels. Outside of CITES, there are limited EU and Seychellois regulations with respect to ETP species impacted by the fishery. A range of species may be impacted by the fishery, including turtles, sharks, rays and cetaceans. Amande *et al* (2008) reports that EU observers recorded interactions with 4 turtle species – green turtle (IUCN endangered), loggerhead turtle (IUCN endangered), Olive ridley (IUCN vulnerable) and hawksbill (IUCN critically endangered) during onboard monitoring of Indian ocean tuna purse seine catches. Of these, only olive ridley and hawksbill turtles were record in association with free school sets. Of the range of international conservation agreements directly or potentially applying to sea turtles, only the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) makes specific provisions to protect sea turtles from international trade. CITES has effectively curbed international trade in sea turtles by prohibiting primarily commercial international trade in all species of sea turtles and their parts. As reported by Amande *et al* (2008) observations in relation to turtles were occasional and almost exclusively made on log-sets (95%). Captures of turtles are overwhelmingly associated with FADs and floating object related sets. Despite this level of encounter in FAD sets, 90% of turtles were recorded as being released alive. Over the period (2003-2007) less than 300 turtles are estimated to have been killed in EU tuna purse seine fisheries in the Indian Ocean. This is less than 60 individuals per year. As previously indicated, the overwhelming majority of this bycatch is associated with log or FAD sets, which are not under certification here. Clermont *et al* (2012) analysed interactions between the EU purse seine fleet and marine turtles in the Atlantic and Indian Oceans over a 15-year period. Over the study period, 597 turtles were caught in 9,398 sets on free schools and 6,515 sets related to FADs (15,913 total sets). 86% of all turtles were released alive into the sea. In addition, Amande *et al* (2008) reports that two species of cetaceans were recorded during purse seine fishing – fin whale (IUCN endangered) and false killer whale (IUCN data deficient). Only fin whales were recorded during so-called free-school sets, but in reality these sets were more/most likely made because of the presence of a whale (hence they are considered associated sets – which are not included under any UoC). It is however likely that the latter were recorded during sets made on whales (so called associated sets). Fin Whales are listed on Appendix I of the Convention on Trade in Endangered Species (CITES). Fin whales are also listed on Appendices I and II of the Convention on Migratory Species (CMS). Romanov (2002) also reports on interaction of IO pure seine fisheries with cetaceans – however these relate to associated sets also. Sufficient evidence has been available to the assessment to conclude that the Echebaster fishery does not make sets that are associated with dolphin schools in the IO. Accordingly, it is considered highly unlikely that the fishery interacts significantly with or causes direct or indirect impacts on IO dolphin populations. Few specific data have been available to the assessment team in relation to encounters with whale sharks during purse seine fisheries. However whale sharks are most likely encountered during sets deliberately made on them and not on freeschool sets. Whale sharks are listed on CITES Appendix II. In Seychelles waters, the Wild Animals (Whale Shark) Protection Regulations, 2003 declares the whale shark (*Rhincodon typus*) protected throughout Seychelles at all times. Nevertheless, while they are unlikely to be retained or feature as bycatch in freeschool sets on account of their size they have been included under the ETP component as whaleshark meets with ETP qualifying criteria and the species is undoubtedly vulnerable to fishing interactions. It is normal practice for these animals to be released from the gear prior to bringing catches aboard and there is no direct evidence to suggest that animals are directly harmed or killed in such encounters although clearly there is potential for such events to occur. The frequency with which this may happen however in freeschool sets is likely to be very low and possible population level impacts are therefore considered negligible.

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
		Other species that may be encountered during freeschool sets exceptionally include giant manta. Giant manta are considered ETP species on account of the prohibition on their retention onboard EU vessels in all waters, as given in EU Regulation (EC) 40/2013. While it is possible that manta rays are captured and may suffer harm during their release from fishing gears, it is a sufficiently rare event so as to be considered negligible in its overall impact. The Echebastar vessels are highly likely to be compliant with EU regulations preventing the retention onboard of manta rays. In this context then the fishery is considered to meet with national and international requirements for the protection of giant manta rays. As for whale sharks, it is normal practice for these animals to be released from the gear prior to bringing catches aboard and there is no direct evidence to suggest that animals are directly harmed or killed in such encounters although clearly there is potential for such events to occur. The frequency with which this may happen however in freeschool sets is likely to be very low and possible population level impacts are therefore considered negligible. The effects of the fishery are known and are considered to be highly likely to be within limits of international and national requirements for protection of ETP species, so the fishery meets the requirements for the SG 60 and 80 levels for this scoring issue. However there is a requirement for more direct evidence byway of supporting data in relation to rates of interaction and outcome in order to consider scoring at SG 100.		
b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Yes	Yes	Yes
	Justification	Instances of encounters between ETP turtle, whale and ray species and purse seine gears have been demonstrated to be infrequent by Amande *et al (*2008) in their analysis of data from EU fleets operating in the Indian Ocean. This is especially the case with respect to sets made on freeschools and most encounters with ETP species are associated with the drifting FAD based fishery. In cases where ETP species are encountered, these do not generally lead to mortality and 90% of turtles are observed to survive. No instances of mortality or harm to whales are reported in the unassociated freeschool fishery, while up to 33% of ray species may also survive. The latter figure refers mainly to ray species other than mantas. Accordingly the assessment team considers that the direct effects of the fishery are highly unlikely to create unacceptable impacts to ETP species, so the fishery meets the requirements of the SG 60 and 80 levels for this scoring issue. Further, that there is a basis for a high level of confidence that there are no significant detrimental direct effects of the freeschool fishery on ETP species, so the fishery also meets the requirements of the SG 100 level for this scoring issue.		
c	**Guidepost**		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Yes	No
	Justification	Indirect effects by way of competition for forage species, destruction of habitat or disturbance have also been considered and are thought to be highly unlikely to create unacceptable impacts, so the fishery meets the requirements of the SG 80 level for this scoring issue. However, due to a lack of specific information and evidence available to the team it was not considered that there is a high degree of confidence that there are no detrimental indirect effects. Therefore scoring at SG 100 level was not appropriate.		

PI 2.3.1	**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**
References	» Amande, M.J., Ariz, J., Chassot, E. et al. (2008) Bycatch and discards of the European purse seine tuna fishery in the Indian Ocean: Characteristics and estimation for the 2003-2007 period. Indian Ocean Tuna Commission document, IOTC-2008-WPEB-12, 23 pp. » Clermont, S., Chavance, P., Delgado, A., Murua, H., Ruiz, J., Ciccione, S. And Bourjea, J. 2012.EU purse seine fishery interaction with marine turtles in the Atlantic and Indian Oceans. A 15 year analysis. IOTC-2012-WPEB08-35 rev_1. » CITES Appendix I and II » Convention on Migratory Species (Bern Convention) » EU Regulation (EC) 40/2013 fixing for 2013 the fishing opportunities available in EU waters and, to EU vessels, in certain non- EU waters for certain fish stocks and groups of fish stocks which are subject to international negotiations or agreements » Romanov E. V., 2002. By-catch in the tuna purse-seine fisheries of the western Indian Ocean. Fish. Bull.100(1): 90-105 » Wild Animals (Whale Shark) Protection Regulations, 2003 » http://ec.europa.eu/research/bioeconomy/pdf/ebfmtuna2012_boa_draft26092012.pdf (Mitigating impacts of fishing on pelagic ecosystems: towards ecosystem-based management of tuna fisheries Draft book of Abstracts 15-18 October 2012 Montpellier – France) » IOTC Report of the Ninth Session of the Working Party on Ecosystems and Bycatch IOTC–2013–WPEB09–R[E]

OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 2.3.2 All UoCs

PI 2.3.2		The fishery has in place precautionary management strategies designed to: • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimise 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 fishery'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 fishery'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?	Yes	Yes	No

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
	Justification	Overall impacts of the freeschool tuna fishery on ETP is very low. However, there is a strategy in place to ensure the fishery continues to improve its performance in relation to ETP interaction management. The strategy comprises a range of measures, some of which are designed specifically to manage impacts of the fishery on non-target bycatch species (releasing large specimens from nets by dropping the float line, releasing large sharks from the deck where they are taken aboard, training for staff in bycatch reduction and impact mitigation, bycatch reduction research). At corporate level there is a commitment to ensuring the sustainability of the fishery and this is evidenced by the number and nature of research undertakings Echebastar have commissioned or are involved in with respect to reduction of impacts on unintended bycatch species. Minimisation of impacts on bycatch species is at the core of the adoption of a new design by Echebastar for a vessel that has been commissioned. The new vessel has been designed with a conveyor that allows for the sorting of catch and the return to the sea of specimens that are unwanted once the fish has been put on the conveyor. This has not been possible to date (and will not be possible until the new vessel is operational) given the design of vessels currently making up the fleet. Ultimately as vessels are changed it is envisaged that the new design will be a feature of all future new builds. This undertaking should be seen in tandem with initiatives that the company are involved in to enhance escapement and removal of unwanted species from gears. Higher-level initiatives aimed at ensuring the fishery complies with national and international requirements for ETP species protection also exist. Within the IOTC a number of resolutions have been adopted that means flag nations are required to take initiatives with respect to their own fleets. Resolutions that are relevant in this regard include: » 13/04 on the conservation of cetaceans; » 13/05 on the conservation of whale sharks; » 12/04 on the conservation of marine turtles; » 12/09 on the conservation of thresher sharks; » 11/04 on a regional observer scheme. Resolutions contain a range of important measures that are designed to manage impacts and that are also intended to generate data in relation to interactions. The detail of the resolutions has been reviewed by the assessment team and it is considered that these represent important milestones in the overall Indian Ocean tuna fishery ETP management strategy development. IOTC resolutions compliment more general measures contained in EU and Seychellois primary and secondary fishery legislation and which also play a role in management of fisheries interactions. Given the information available, the assessment team believes that there are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species, so the fishery meets the requirements of the SG 60 level for this scoring issue. Further, there is a strategy in place for managing the fishery'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, so the fishery also meets the requirements of the SG 80 level for this scoring issue. However, because the strategy is not considered comprehensive, the fishery does not meet the SG 100 level for this issue.		
b	**Guidepost**	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 strategy will work, based on information directly about the fishery and/or the species involved.	The 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?	Yes	Yes	No

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
	Justification	The recorded rate of interactions with ETP species is low and a limited number of species may be affected. The range of measures in place to limit impacts has improved and covers all species commonly encountered, therefore the fishery meets the SG 60 level for this scoring issue.Pesqueras Echebastar has demonstrated commitment to reducing and mitigating adverse impacts on ETP species. This is considered an objective basis for confidence that the strategies will work, so the fishery meets the SG 80 level for this scoring issue. However, quantitative analysis is lacking that supports high confidence that the strategy will work, so the fishery fails to meet the SG 100 level for this scoring issue.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Yes	Yes
	Justification	Data in relation to interactions with unwanted non-tuna bycatch including ETP species given by Amande *et al* (2008) shows that the rate of interactions is very low. Furthermore, the consequence of instances of capture of unwanted species are frequently non-lethal and many captured specimens of turtles (90%), whales and /or manta rays survive the encounter. Overall opinion of the published scientific community seems to support the understanding that the rates of interaction of freeschool tuna sets with purse seine gears does not result in unsustainable levels of impact or interaction with ETP species. Based on this evidence, the assessment team believes that there is clear evidence that the strategy is being implemented successfully, so the fishery meets the requirements of the SG 80 and 100 levels for this scoring issue.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			No
	Justification	Published findings for monitoring of bycatch of ETP species supports the understanding that the strategy is achieving its objectives of ensuring the direct and indirect effects are not detrimental to any ETP species. There are few instances of direct interaction or impacts and indirect impacts through competition for forage, habitat destruction and disturbance have been considered. Decreasing population trends for whaleshark, manta ray and the two turtle species encountered in the fishery have not been attributed to the operation of the freeschool fishery in the Indian Ocean (IUCN). However, the assessment team considered that there was insufficient evidence to state categorically that objectives were being achieved as a result of the operation of the management strategy, specifically there is a lack of up to date observer data in relation to ETP interaction with the fishery in order to confirm the objectives are being achieved. Accordingly the scoring issue has not been awarded.		
References		» IOTC Resolution 13/04 on the conservation of cetaceans » IOTC Resolution 13/05 on the conservation of whale sharks » IOTC Resolution 12/04 on the conservation of marine turtles		

PI 2.3.2	**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
	» IOTC Resolution 12/09 on the conservation of thresher sharks » IOTC Resolution 11/04 on a regional observer scheme » http://ec.europa.eu/research/bioeconomy/pdf/ebfmtuna2012_boa_draft26092012.pdf (Mitigating impacts of fishing on pelagic ecosystems: towards ecosystem-based management of tuna fisheries Draft book of Abstracts 15-18 October 2012 Montpellier - France) » IOTC Report of the Ninth Session of the Working Party on Ecosystems and Bycatch IOTC–2013–WPEB09–R[E]

OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 2.3.3 All UoCs

PI 2.3.3		**Relevant information is collected to support the management of fishery 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	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Yes	No	No
	Justification	There is some information available in relation to the rate of interaction with ETP species of EU purse seine fleets operating in the Indian Ocean. These allow for a good understanding of the ETP species involved as well a general understanding of levels of interaction and to a lesser extent the likely fate (outcome) for species from capture events. Examples of such data include a review of EU purse seine fleet observer data from 2003-2007 (Amande, 2008). Other sources of data include Echebastar group records of bycatch, results of investigations conducted by Echebastar group as well as a wide range of published studies e.g. Romanov (2002), Pianet (2006), Sarralde et al (2006) and Delgado de Molina et al (2005). The reports of the Working Party on Ecosystems and Bycatch of the IOTC (WPEB) provide a useful annually updated source of information in relation to bycatch of all types of species and interactions with ETP species in Indian Ocean tuna fisheries. However the assessment team consider that it would be appropriate for scoring at SG80 that specific recording of ETP interactions should be undertaken by Pesqueras Echebastar vessels during all unassociated freeschool tuna sets as part of standard onboard procedures, even where there are no interactions. Specific data for the fleet would allow fishery related impacts to be quantitatively estimated for ETP species and would help identify more clearly the risks by documenting capture rates for species, size distributions of ETP species, temporal and spatial patterns of interaction, response and outcome. Recordings should include interactions with the full range of ETP specie inc. sharks, rays, cetaceans and turtles. Based on this information, the assessment team believes that information is sufficient to qualitatively estimate the fishery related mortality of ETP species, so the fishery meets the SG 60 level for this scoring issue. However, because the information is not sufficient to allow the impact of the fishing to be quantitatively estimated for ETP species, and with a high degree of certainty, the fishery does not meet the SG 80 and 100 levels for this scoring issue.		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Yes	Yes	No

PI 2.3.3		**Relevant information is collected to support the management of fishery 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.**		
	Justification	Information is sufficient to understand that that the freeschool fishery does not present a significant threat to ETP species identified as being potentially affected by the operation of the fishery. Information is available in relation to the scale of interaction with turtles, cetaceans, whale sharks and manta rays. Information is also sufficient to determine that lethal consequences from interactions are, in the main, not very likely. In combination with the understanding that rates of encounter are low, there is a basis for determining that the fishery does not present a significant threat to any ETP population. Therefore, the assessment team believes that the fishery meets the requirements of the SG 60 and 80 levels for this issue. However, available information and ongoing data collection stops short of being accurate and verifiable in relation to the magnitude of all impacts, mortalities and injuries of affected ETP species and the consequences for the status of ETP species. Hence SG100 is not met.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full 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?	Yes	Yes	No
	Justification	Considerable information is available in relation to qualitative and quantitative nature of interactions between ETP species and the purse seine fleet. Information is relatively recent and is presently being updated through new observer initiatives that commenced during 2013. Additional observer schemes will be implemented during 2014 on the fleet under assessment in conjunction with ISSF. Comprehensive information is available in relation to the fleet operations (spatial effort, temporal activity, overall effort) in order to support a full strategy to manage impacts on ETP species. Some information is available in relation to the status of affected ETP populations e.g. IUCN population status assessment, overall population trends, bio geographical range etc. information however does not support a comprehensive strategy that is specifically designed to manage impacts on the ETP component and minimize mortality and injury of ETP species and evaluate with a high degree of certainty whether a strategy is achieving its objectives. Therefore, the assessment team believes that the fishery meets the requirements of the SG 60 and 80 levels for this issue. However, as the information is not 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, the SG100 is not achieved for this scoring issue.		
References		» Pianet R., 2006. Analysis of data obtained from observer programmes conducted in 2005 and 2006 in the Indian Ocean on board of French purse seiners. IOTC, WPBE » Delgado de Molina A., Ariz J., Sarralde R., Pallarés P. and J. C. Santana, 2005. Activity of the Spanish purse seine fleet in the Indian Ocean and by-catch data obtained from observer programmes conducted in 2003 and 2004. IOTC-2005-WPBy-13 » Romanov E. V., 2002. By-catch in the tuna purse-seine fisheries of the western Indian Ocean. Fish. Bull.100(1): 90-105 » Sarralde R., Delgado de Molina A., Ariz J. and J. C. Santana, 2006. Data obtained from purse-seine observers carry out by the Instituto Español de Oceanografía from the National Database Plan between 2003 and 2006. IOTC-2006-WPTT-07 » http://ec.europa.eu/research/bioeconomy/pdf/ebfmtuna2012_boa_draft26092012.pdf (Mitigating impacts of fishing on pelagic ecosystems: towards ecosystem-based management of tuna fisheries Draft book of Abstracts 15-18 October 2012 Montpellier – France)		

PI 2.3.3	**Relevant information is collected to support the management of fishery 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.**	
	» IOTC Report of the Ninth Session of the Working Party on Ecosystems and Bycatch IOTC–2013–WPEB09–R[E]	
OVERALL PERFORMANCE INDICATOR SCORE:		**75**
CONDITION NUMBER (if relevant):		**8**

Evaluation table for PI 2.4.1 All UoCs

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Yes	Yes	Yes
	Justification	The fishery takes place entirely in the epipelagic ecosystem, at all times above 200m depth, although the water may be much deeper. In this context fishing gears do not operate at depths greater than 200m and always in waters that are considerably deeper than this (up to several thousand meters). At no time do purse seine gears make contact with the seabed or any biogenic reef. No vulnerable habitats are impacted during the setting of gears or at any time during the fishing operation or at any other time of the vessels operations in the Indian Ocean tuna purse seine freeschool set fishery. Accordingly, the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, thefore the fishery is determined to meet the requirements of the SG 60, 80 and 100 levels.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

Evaluation table for PI 2.4.2 All UoCs

PI 2.4.2		**There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Yes	Yes	Yes
	Justification	The operation of the tuna fisheries utilizing purse seine gears to target freeschool tuna on the open ocean (normally in the surface layer of very deep waters) ensures that there are never any interactions with the seabed. The typical cost of a tuna purse seine is up to €800,000 – costs associated with damage to the gear which is not reinforced for seabed contact would render even momentary contact with seabed structures a prohibitively expensive occurrence. While Echebastar group have undertaken to reduce the ecological footprint of their tuna purse seine operations, there is no requirement to manage seabed habitat impacts that are normally associated with gears contacting the seabed or sensitive habitats such biogenic reefs etc. Based on the evidence presented above, the assessment team believes that there are measures, and a full strategy in place for managing the impact of the fishery on habitat types, therefore the fishery is determined to meet the requirements of the SG 60, 80, and 100 levels for this issue.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Yes	Yes	Yes
	Justification	Knowledge in relation to the way purse seine fishing gear is used (on the sea surface and the upper 60 meters) as well as the sea areas where the fleet operates (open ocean, deep waters often up to several thousand meters deep) is sufficient to discount any significant impacts on seabed habitats accruing from the fishing operation. No significant impacts on the epipelagic ecosystem habitat are associated with the use of purse seine gears. Accordingly there is high confidence that the strategy will work. Therefore the fishery is determined to meet the requirements of the SG 60, 80, and 100 levels for this issue.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Yes	Yes
	Justification	There are no recorded instances of gear damage through contact with the seabed. Nets do not regularly require repair due to encounters with subsurface structures and nets tend to last a number of seasons due to the lack of contact related damage. VMS records for the fleet confirm that purse seine operations are not carried out in shallow waters where there is a risk to gear or the seabed. No significant impacts on the epipelagic ecosystem are associated with the use of purse seine gears in tuna fisheries. There is clear evidence that the strategy is being implemented successfully, therefore the fishery meets the requirements of the SG 80 and 100 levels.		

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			Yes
	Justification	The strategy is to catch tuna in the surface layers of the ocean, thereby avoiding the need to use gears that are associated with a wider range of environmental impacts. Purse seine fishing is widely recognised as a low impact means of fishing for pelagic species. Seabed encounters or encounters with biogenic reef forming communities are unheard of in the typical water depths that the fleet operates in. There are no reports of seabed contacts from available observer data and reports based on such data. No species that would be considered exclusively benthic or bottom dwellers are recorded in observer programme reports or studies based on same. No concerns at management level or amongst stakeholder in the context of damage to seabed habitats or the epipelagic habitat resulting from purse seine fishery operations have been expressed to the team at any time during the assessment process. Based on the above evidence, it is clear that there is some evidence that the strategy is achieving its objective, therefore the fishery meets the requirements of the SG 100 level.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				

Evaluation table for PI 2.4.3 All UoCs

PI 2.4.3		**Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Yes	Yes	Yes
	Justification	The fishery takes place in the epipelagic habitat. There are no habitat types present that are considered to be vulnerable. 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 Indian Ocean. Outside of this epipelagic habitat, many areas of the Indian Ocean have been mapped and there is information in relation to the occurrence of sensitive and/or vulnerable seabed habitats. However, the seabed habitat is considered to be outside of the spatial range within the fishery operates and is therefore not considered relevant to scoring of this issue. There are no sensitive habitats in the pelagic ecosystem that could be damaged or impacted through the use of purse seine gears. Based on the above evidence, the assessment team believes that the distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types, and therefore the fishery meets the requirements of the SG 60, 80, and 100 levels.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Yes	Yes	No
	Justification	Physical impacts of the gear on the pelagic ecosystem are considered to be highly unlikely to occur and no evidence has been presented to the team that suggests there are specific risks to the pelagic habitat. However, a precautionary approach to fisheries would suggest that the potential for impacts to occur should be investigated. Specific investigations in this regard may therefore be warranted. Therefore the assessment team believes that the information is adequate to understand the nature of the main impacts of the gear on habitat, and that there is sufficient data available to allow for the determination of habitat impacts, therefore the fishery meets the requirements of the SG 60 and 80 levels. However, it is clear that the physical impacts of the gear on the habitat types have not been quantified fully, so the fishery does not meet the requirements of the SG 100.		
c	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Yes	No

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	Justification	Changes in distributions of all marine habitats within the oceanic areas that the fishery operates in overtime are not measured. In particular there is little monitoring of coastal and deep-ocean habitats around the Indian Ocean. While the fishery is pelagic and does not take place in these parts of the ocean, the performance indicator is relevant in the context of habitats not used by the fishery also. The habitat within which the fishery operates is entirely pelagic. Subtle physical and or chemical changes in pelagic habitat may occur over time. Some of these e.g. temperature, turbidity and salinity are subject to seasonal variation and can be easily monitored and changes detected using remote sensing (e.g. satellite imagery). Other changes such as water movement (density and wind driven ocean currents, tidal currents and ocean swell) require more direct techniques for measurement. However large-scale changes in the overall distribution of epipelagic habitat do not occur over a time frame that is relevant in the context of managing fisheries. Despite this, the area of pelagic habitat available to and suitable for making sets on freeschools of tuna does vary according to oceanographic conditions as well as changing security and geopolitical circumstances. Information in relation to such changes is available and is updated regularly. Based on the evidence presented, the assessment team believes that sufficient data continues to be collected to detect any increase in risk to habitat, therefore the fishery meets the requirements of the SG 80 level. However, there is clearly not sufficient information to measure changes in habitat distributions over time, therefore the fishery does not meet the SG 100 level.
References		
OVERALL PERFORMANCE INDICATOR SCORE:		**85**
CONDITION NUMBER (if relevant):		

Evaluation table for PI 2.5.1 All UoCs

PI 2.5.1		**The fishery 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	**Guidepost**	The fishery 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 fishery 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 fishery 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
	Justification	Impacts of the fishery on biotic elements of the ecosystem (retained species, bycatch, Endangered threatened and protected species and habitats) have been considered in previous P2 scoring components. Other elements underlying ecosystem structure and function not previously considered include abiotic elements (environmental parameters including physical and chemical parameters) and biotic elements and processes such as photosynthesis, epipelagic oceanic food webs (trophic structure including predator/prey relationships), abundance of predators and availability of forage species. Normal function within an ecosystem is dependent on relative stability in relation to key underlying biotic and abiotic elements. While there are few published studies that examine the overall health of the Indian ocean ecosystem, some depletion of higher level predators in the Ocean has been documented. Preliminary results of an analysis of abundance trends of several elasmobranch and teleost fish in the Indian Ocean pelagic ecosystem were presented to IOTC's WPEB meeting in October 2009, based on data from research longline cruises. A widespread decline in the abundance of top predators such as large pelagic sharks and tunas was demonstrated, as was the emergence of several mid-sized, lower-trophic-level species such as crocodile shark and lancetfish. The relative abundances of lancetfish and tuna showed a dramatic shift between 1960-1990 and 2000-2008, with tuna being replaced by lancetfish. During 1960-1990 there were 5 tuna to 1 lancetfish, now there is 1 tuna to 5 lancetfish. This is considered to be likely related to removal of large numbers of top predators in directed shark fisheries as well as bycatch of sharks in tuna fisheries, especially those utilizing drifting artificial FADs where unobserved capture of sharks is known to be a source of significant ongoing unrecorded mortality. The decline in top predators is also likely to be due in part to declines in large pelagic tunas, especially southern Bluefin, bigeye and yellowfin tuna. Yellowfin (targeted in this fishery) has a trophic level of 4.3, while bigeye ha a trophic level of 4.5. (www.fishbase.org). SKJ has a trophic level of around 3.8. Depletion of large tunas, the recovery of the Indian Ocean yellowfin tuna stock in recent years and likely maintenance of all tuna stocks within biologically based limits is expected to prevent further reductions in abundance of large tunas and therefore consequential further changes in Indian Ocean fish community structure through removal of tuna are not anticipated. It is therefore considered highly unlikely that the freeschool set purse seine tuna fishery will disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. Catches of tuna in the freeschool fishery were significantly higher in the past, going back to the early to mid 2000's. Since then, significant changes have occurred in that drifting FADs were introduced into the fishery and are now used on a wide scale. The majority of Indian Ocean tuna purse seine fisheries are now based around the use of drifting FADs and some 90% of purse seine caught tuna is taken in FAD related sets. Therefore, the freeschool fishery is considered highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm, (PI SG of 80), but given that there is no real evidence of that (PI SG of 100), the free school purse seine fishery for bigeye, yellowfin and skipjack tuna is scored at 80 for this PI.		
References		» http://ec.europa.eu/research/bioeconomy/pdf/ebfmtuna2012_boa_draft26092012.pdf (Mitigating impacts of fishing on pelagic ecosystems: towards ecosystem-based		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function
	management of tuna fisheries Draft book of Abstracts 15-18 October 2012 Montpellier - France) » IOTC Report of the Ninth Session of the Working Party on Ecosystems and Bycatch IOTC–2013–WPEB09–R[E] » Sherman, K., Okemwa, E.N. and Ntiba, M.J. (eds.) 1998. Large marine ecosystems of the Indian Ocean: Assessment, sustainability and management. Published by Blackwell Science Inc. » Polacheck, T, 2006. Tuna longline catch rates in the Indian Ocean: Did industrial fishing result in a 90% rapid decline in the abundance of large predatory species? Marine Policy 30 (2006) 470–482 » Southwest Indian Ocean Fisheries Project http://www.swiofp.net
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 2.5.2 All UoCs

PI 2.5.2		**There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Yes	Yes	No
	Justification	A partial strategy is defined as "a cohesive arrangement which may comprise one or more measures, an understanding of how they work to achieve an outcome and an awareness of the need to change the measure/s should they cease to be effective. It may not have been designed to manage impacts on the specific component". Tuna – especially yellowfin and bigeye, but also bluefin, albacore and skipjack are important predatory species in the Indian Ocean. There is range of measures in place in order to ensure the fishery does not cause serious or irreversible harm to ecosystem structure and function. Of greatest relevance perhaps is the adoption of the precautionary approach by IOTC in relation to management of tuna fisheries, the implementation of interim stock specific biomass target and limit reference points as well as the commitment to development of robust harvest control rules through the MSE process. Other measures that contribute to ensuring that serious or irreversible harm is avoided include: » Creation of a single body (RFMO - IOTC) in order to co-ordinate and provide a unified approach to management of Indian Ocean fisheries amongst contracting parties and co-operating non-contracting parties » capacity limitation of fleets » spatial and temporal closures » implementation of full catch reporting and elimination of IUU fisheries » development of resolutions to ensure that efforts are made to reduce the bycatch of vulnerable species such as pelagic sharks, turtles, cetaceans and whalesharks » collection of data and statistics in relation to tuna catches, bycatch, ecosystem component interactions and a range of other fishery specific criteria through mandatory reporting requirements as well as the operation of independent observer schemes » ongoing research and investigations into impacts of tuna fisheries on the Indian Ocean ecosystem amongst IOTC members Although not specifically designed to manage impacts on the ecosystem, the range of measures is considered to represent a partial strategy that works to achieve the intended outcome. The measures are also likely to indicate a need for change/greater levels of management effort due to ineffectiveness of the partial strategy, therefore the fishery meets the requirements of the SG 60 and 80 levels However, no overall large marine ecosystem management plan has been agreed amongst IOTC contracting and co-operating parties for the Indian Ocean, so the fishery does not meet the requirements of the SG 100 level.		

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
b	Guidepost	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	Yes	Yes	No
	Justification	IOTC was created specifically to manage fisheries for species within its area of competence. In this regard, IOTC through the Working Party on Tropical Tunas and the Working Party on Ecosystem and Bycatch actively seek updated information in relation to a wide range of biological and fishery parameters. Information is taken into account in the formulation of updated stock assessments for tuna species and for reviews of stock status for non-assessed species. The scientific committee of IOTC also takes into account available information as part of some of the SC functions that includes: » Recommending policies and procedures for the collection, processing, dissemination and analysis of fishery data; » Developing and coordinating cooperative research programs involving Members of the Commission and other interested parties, in support of fisheries management; » Assessing and reporting to the Commission on the status of stocks of relevance to the Commission and the likely effects of further fishing and of different fishing patterns and intensities; » Formulating and reporting to the sub-commission, as appropriate, on recommendations concerning conservation, fisheries management and research, including consensus, majority and minority views. THE MSE process that is progress is also taking into account a wide range of information in relation to Indian Ocean fisheries for individual tuna stocks. This is likely to lead the formulation of long-term biomass reference points along with an appropriate HC for tuna stocks. Seychelles is a partner in the Southwest Indian Ocean Fisheries Project (see http://www.swiofp.net/). SWIOFP is an ambitious multinational research project with an overall objective to ensure that the West Indian Ocean's marine resources sustainably managed for use and benefit by the region's coastal states. The project forms part of the Large Marine Ecosystem Programme approach (LME) and is supported by the Global Environment Facility (GEF) as a contribution to its international waters programme and is implemented by the World Bank. Over the duration of the project, nine countries of the Western Indian Ocean will work together to understand and management better their fisheries through an LME and ecosystem based approach to fisheries management. Based on the above evidence, it is clear that measures take into account potential impacts of the fishery on key elements of the ecosystem, and the partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance. Therefore the assessment team believes that the fishery meets the requirements of the SG60 and 80 levels. However there is no strategy (consisting of a plan) to manage impacts on the ecosystem, therefore the SG100 is not met.,		

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Yes	Yes	No
	Justification	The partial strategy considers most of the significant sources of fishery related risks to the Indian Ocean ecosystem, namely the removal of target species, risks associated with impacts of bycatch and discarding of a wide range of non-target species and IUU. A range of other risks are also addressed in the strategy. Overall, the partial strategy is considered likely to work. In recent years, a range of new management measures have been agreed amongst IOTC members and these have been introduced through IOTC resolutions that are in general adopted and implemented by all members and co-operating non-contracting parties. Resolutions are agreed by majority vote and where adopted has caused member states to respond accordingly by introducing new rules and/or regulations that apply to its vessels. Therefore the fishery meets the requirements of SG 60 and 80 levels, but not the SG100 level.		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Yes	No
	Justification	There is some evidence that the measures comprising the partial strategy are being implemented successfully. All tuna stocks are believed to be within biologically based limits and above interim limit reference points. Yellowfin tuna stock status has improved in recent years. Other evidence that the partial strategy is working is also available. This is demonstrated by the substantial reduction of IUU within the IOTC area of competence, by the updating of stock assessments, increased sharing of information and co-operation amongst members and co-operating non-contracting parties, the increased levels of research undertaken by IOTC members in the Indian Ocean fisheries, agreement over new and expanded management initiatives (such as adoption of the PA and commitment to MSE) through adoption of IOTC resolutions as well as by the recovery of yellowfin tuna stock status which was considered depleted in recent years. Therefore the assessment team believes that the fishery meets the requirements of the SG 80 level, but not the requirements of the SG 100 level.		
References		» Southwest Indian Ocean Fisheries Project http://www.swiofp.net » Indian Ocean Tuna Commission http://www.iotc.org		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				

Evaluation table for PI 2.5.3 All UoCs

PI 2.5.3		**There is adequate knowledge of the impacts of the fishery on the ecosystem**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Yes	Yes	
	Justification	Adequate amounts of information of sufficient quality are available to broadly understand the key elements of the ecosystem. Significant quantities of regularly updated data in relation to abiotic ecosystem elements are available from a wide range of sources and entities that monitor and carry out research into environmental (physical and chemical) parameters in the Indian Ocean. Most coastal states in the western Indian Ocean carry out at least some scientific research and /or monitoring of environmental conditions within the EEZ. A range of organizations that have interests in researching and monitoring global environmental conditions also carries out significant amounts of research in the Indian Ocean. Much information of direct relevance to management of fisheries impacts is presented to and exchanged or published through the working parties of the IOTC such as the Working Party on Tropical Tunas, Working Party on Ecosystems and Bycatch, Working Party on Billfish, Working Party on data Collection and Statistics. Information available covers all main areas of relevance in the context of understanding key abiotic and biological elements of the Indian Ocean ecosystem. Given the evidence described above, the assessment team believes that the fishery meets the requirements of the SG 60 and 80 levels.		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Yes	Yes	No
	Justification	Impacts of the fishery on key ecosystem elements (biological, abiotic) can be inferred from existing information. Impacts of the fishery on some biological elements in particular have been investigated in detail, or can be inferred, including status of tuna stocks, levels of bycatch (specifically for Echebastar group vessels as well as at EU fleet level in respect of major species groups), impacts on habitats and ETP species. However, given that the fisheries are industrial scale, not all interactions have been investigated in sufficient or appropriate detail as would be indicative of ecosystem based approach to fisheries management. Possible changes in trophic structure of pelagic oceanic ecosystems have not been investigated in sufficient detail and there is ongoing uncertainty in relation to the role of tuna fisheries in reduction of top-level predators in the Indian Ocean as well as an observed increase in the prevalence of lower trophic level pelagic species. Despite these shortcomings, the fishery currently meets with the scoring issue at SG80 in that impacts on some biotic components impacts have been investigated in detail. However the assessment team believes that the fishery does not meet the requirements of the SG 100 level, that is the main interactions between the fishery and these ecosystem elements can not be inferred from existing information, and they have not been investigated		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
c	Guidepost		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Yes	No
	Justification	The main functions of species impacted by the Indian Ocean freeschool purse seine tuna fishery are known. Sufficient information is available in order to identify the range of species that are impacted and to determine their respective roles e.g. as low trophic level species, key low trophic level species, higher trophic level prey species, forage species, predators and potential roles in transfer of energy and nutrients between various pelagic habitats (epipelagic, mesopelagic, bathy-pelagic) or between pelagic and demersal habitats. The main functions of the pelagic habitat are known and the potential impacts of freeschool purse seine tuna fisheries on these are understood. However, not all impacts of the fisheries on target, retained, bycatch and ETP species are sufficiently understood to meet with SG100.		
d	Guidepost		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Yes	No
	Justification	The main consequences of ecosystem impacts associated with the freeschool fishery can be inferred from knowledge in relation to the scale of the fishery i.e. removals of target, retained and ETP species and interactions; together with available information in relation to the sensitivity or vulnerability of species and habitats to fishing interactions. Information in relation to the distribution, abundance and biological/life history characteristics of many species (scoring elements) impacted by the fishery are known at a level that is adequate to allow consequences and impacts on outcome status to be inferred. While available information in relation to the biology some species/scoring elements is significantly greater than for others, general understanding of the likely resilience of species and status and robustness of many affected populations supports determination of the most likely consequences for most. Sources of information in relation to population status for many affected species include www.fishbase.org , IUCN http://www.iucnredlist.org , http://www.iotc.org .		
e	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Yes	No

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem
	Justification	A wide range of fishery, biological and environmental data continue to be collected by many different organisations with an interest in the Indian Ocean, including Spain, other EU nations, Seychelles and most other coastal states that are members of IOTC or which are co-operating non-contracting IOTC parties. Data are collected in relation to: » Catches of all tuna species by Pesqueras Echebastar and at IOTC member level for different gear types and means of fishing » Data in relation to the spatial and temporal operation of the fishery (VMS) » Data in relation to catch by area » Data in relation to fishing effort » Data in relation to the biology of many vulnerable species potentially impacted by the fishery » Data in relation to levels of bycatch (in relation to fleet level operations) from observer programmes Data is continually being updated for most of these criteria and is available to indicate potential or actual changes in levels of risk to ecosystem elements and components. There are however shortcomings in the availability of information that supports the development of management strategies for specific ecosystem impacts or risks. For example, data in relation to slippage (discarding) of tuna catches is unreliable and discard rates cannot be verified. Data in relation to ETP encounters is not systematically collected onboard vessels, and while there is a reasonable degree of understanding about rates of impact, greater levels of specific information would allow for development of more targeted and specific measures aimed at reducing / minimizing impacts.
References		» Reports of the WPEB, IOTC www.iotc.org » Reports of the WPTT, IOTC www.iotc.org » Amande, M.J., Ariz, J., Chassot, E. et al. (2008) Bycatch and discards of the European purse seine tuna fishery in the Indian Ocean: Characteristics and estimation for the 2003-2007 period. Indian Ocean Tuna Commission document, IOTC-2008-WPEB-12, 23 pp. » Echebastar S.A. catch data 2008-2011, Western Indian Ocean tuna fishery » Chavance, P., Amande, J.M., Pianet, R., Chassot, E. and Damiano, A. 2011. Bycatch and Discards of the French Tuna Purse Seine Fishery during the 2003-2010 Period estimated from Observer data IOTC-2011-WPEB07-23 Rev_1 » Poisson F., Vernet A.L., Filmalter J.D., Goujon M., Dagorn L. 2011. Survival rate of silky sharks (*Carcharhinus falciformis*) caught incidentally onboard French tropical purse seiners. IOTC-20110WPEB07-28 » EU and Seychellois tuna fleet monitoring (VMS) records » http://ec.europa.eu/research/bioeconomy/pdf/ebfmtuna2012_boa_draft26092012.pdf (Mitigating impacts of fishing on pelagic ecosystems: towards ecosystem-based management of tuna fisheries Draft book of Abstracts 15-18 October 2012 Montpellier - France)

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 3.1.1

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **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	**Guidepost**	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

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **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.**		
	Justification	Tuna fisheries in Indian Ocean take place under a double legal framework. On a regional level, the management body responsible for the fisheries is the IOTC which is the RFMO mandated to manage tuna and tuna-like species in the IO and adjacent seas. On the other hand, national Administrations of coastal countries have the fisheries legal responsibility in their EEZ. Most of them are members of IOTC. The IOTC was established in 1993 at the 105th Session of the Council of the Food and Agriculture Organization of the United Nations (FAO) under Article XIV of the FAO constitution. As such, the IOTC Members can make decisions concerning the management of tuna and tuna-like resources, and their associated environment, binding on all Members and Cooperating non-Contracting Parties and entered into force in 1996. The Rules of Procedure were in 1997 and these are consistent with international laws and standards. From 1997 additional rules have been approved and at present IOTC is a framework with an effective legal system and organized and effective cooperation with other parties. The IOTC was formed on the basis of international agreements for fisheries management (the Convention on Highly Migratory Species, the FAO Code of Conduct for Responsible Fisheries etc.). European Union is member of IOTC and their vessels are subjected both legal frameworks (EU and IOTC). In some cases, EU legislation is more restricted than IOTC rules. The Common Fisheries Policy of the EU stated in Article 29 of the "REGULATION (EU) No 1380/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the Common Fisheries Policy" that: “The Union shall foster cooperation among RFMOs and consistency between their respective regulatory frameworks, and shall support the development of scientific knowledge and advice to ensure that their recommendations are based on such scientific advice.” European Union Vessels operate in Indian Ocean through Fisheries Partnership Agreements. The main roles of EU in the Indian Ocean in relation with tuna fisheries are implemented of two different ways. Fisheries Partnership Agreements (FPA) signed between EU and some coastal members including Seychelles (but not only this. Also Madagascar, Mozambique, Comoros and Mauritius have FPA with the EU). In the other hand, European Union is member of IOTC RFMO. IOTC manages tuna resources of the Indian and therefore, the European Union and any other member country may propose management measures are evaluated in the bosom of the IOTC. At national level, Seychelles has fisheries legal framework named “Fisheries Act" published in 1981. Seychelles Fishing Authority (SFA) is the Administrative body charged with the fisheries management system in the country and it´s signatory to most major international fisheries agreements.This ensures that the management system is consistent with international laws. Seychelles is a member of IOTC. Accordingly, at a regional and national level the framework for the management system is generally consistent with local, national and international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2. The elements ofscoring issue a.is met at SG 60 and also SG80 but is not met with at SG100.		
b	**Guidepost**	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 fishery.	The management system incorporates or 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.

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **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.**		
	Met?	Yes	Yes	No
	Justification	The regional management level (IOTC) incorporate formal dispute resolution procedure in regional level (Article XXIII of the Agreement of IOTC covers “Interpretation and Settlement of Disputes”) in two levels. First one through conciliation procedure between the parts to be adopted by the Commission and if the dispute is not settled, it may be referred to the International Court of Justice in accordance with the Statute of the International Court of Justice. The mechanism is transparent; but given the lack of disputes it not may be argued that the system is proactive in dealing with potential disputes. At the National management level, Seychelles Fisheries Act provides the possibility to appeal some decision against the refusal, suspension, cancellation, or variation of the fishing vessels license conditions but only in this case. Scoring issue b meets with SG60 and also SG80 requirements, but the mamagement system has not been fully tested and proven to be effective, therefore not possible to score at SG100.		
d	**Guidepost**	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

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **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.**
	Justification	Regional Context: The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995 UN Fish Stocks Agreement) has greatly enhanced the role of RFMOs in the management and conservation of straddling and highly migratory resources by establishing in legally-binding terms the matters on which States are expected to agree in order to attain sustainable fisheries management. These include management measures, agreement on participatory rights such as allocation of allowable catch and/or effort, decision-making rules, and mechanisms to acquire scientific advice and ensuring compliance with management measures. IOTC is the RFMO for Indian Ocean. However, IOTC provides only for the rights of nations to fish resources and the nation state distributed these rights between groups depending on national policy and legislation of each country. IOTC does not regulate to influence the catch of people who are dependent on fishing for food and livelihoods. In some resolutions it seeks to support fishing in coastal states and by argument this could assist those who are dependent on fishing for food and livelihoods. EU FPAs with third countries ensure that Union fishing activities in third country waters are based on the best available scientific advice and relevant information exchange, ensuring a sustainable exploitation of the marine biological resources, transparency as regards the determination of the surplus and, consequently, a management of the resources that is consistent with the objectives of the CFP. Respect for democratic principles and human rights, as laid down in the Universal Declaration of Human Rights and other relevant international human rights instruments, and for the principle of the rule of law, constitutes an essential element of sustainable fisheries partnership agreements, which should contain a specific human rights clause. National Context: In the Seychelles, the Fisheries Act, there isn't distinction in management between commercial fishermen and those that rely on fishing for food and livelihoods. Issue c is scored at SG80. Refer to articles of the IOTC and any other provisions that may protect or acknowledge the rights of people's customary rights for fishing for food or livelihood.
References		» FAO Council 1993.The Agreement for the Establishment of the Indian Ocean Tuna Commission. Hundred and Fifth Session in Rome on 25 November 1993. http://www.iotc.org/English/info/mission.php » United Nations Convention on the Law of the Sea of 10 December 1982 (UNCLOS). http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf » FAO Code of Conduct for Responsible Fisheries adopted in the FAO Conference 1995. http://www.fao.org/docrep/005/v9878e/v9878e00.HTM » The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (in force as from 11 December 2001): http://www.un.org/Depts/los/convention_agreements/convention_overview_fish_stocks.htm » Establishment Act of Seychelles Fisheries Authority Chapter 214 http://www.sfa.sc/Legislations/SFA%20Establishment%20Act.pdf

PI 3.1.1	**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **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.**
	» Fisheries Partnership Agreement between the European Community and the Republic of the Seychelles Official Journal L 290 , 20/10/2006 P. 0002 - 0005 » Agreement on fisheries between the European Economic Community and Republic of Seychelles Official Journal of the European Union. Entry into: force 10 May 2003
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 3.1.2

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organizations 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.	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Yes	Yes	No
	Justification	Regional context: IOTC define roles and responsibilities both its contracting parties and co-operating non-contracting parties ensuring that all organizations and individuals involved in the management process have been identified, with functions, roles and responsibilities are explicitly defined and, in general, these are well understood for key areas of responsibility and interaction for all the parties. These key areas are related with the provision of basic catch data and catch sampling, implementing research programs and developing initial stock assessments and scientific advice between others. IOTC performs an important effort for parties to understand and accept their roles and responsibilities. However, this is not always the case and the parties do not perform this work efficiently and effectively in some areas. National context: Seychelles Fisheries Act functions, roles and responsibilities are also explicitly defined and well understood for SFA and are implemented through their legal Acts and administrative mandates. This issue is scored at SG80, as the elements of SG60 and 80 are clearly met.		

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**		
b	**Guidepost**	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
	Justification	Regional Context: IOTC Working Parties included the Scientific Committee and the Commission meet regularly seek and accept relevant information incorporating it managing system. The necessary information that feeds Management System is provided by the countries that constitute the IOTC according to protocols and rules of the Organization. Coastal countries take into account all relevant information for the management of the fishery and include local knowledge.The management system includes this information in their reports, Resolutions and Recommendations. All of them are published and made available to all interested parties through its website. In reference to EU and EC processes consultation, the main consultation process is established through the Long Distance Regional Advisory Council (LDRAC). National Context: As any other member of the IOTC, Seychelles takes part of IOTC meeting and provides relevant information, including local knowledge, about the tuna fisheries in their waters. This information is incorporated in the Resolutions and Recommendations of IOTC. However the national consultation processes are not included in the Fisheries Act as system for obtaining relevant information. Stakeholder consultations are held on a regular basis regarding the development of the sector. The SFA works in close collaboration with Ministry Natural Resources, Ministry of Environment and Energy, Seychelles Coast Guard, Seychelles Ports Authority, other Government institutions, fishermen and boat owners associations, NGO's as well as overseas partners. The management system takes into account existing information about the status of the fishery including the best scientific information available. However, not always socio-economic information is analyzed and included in the management system regularly SG80 PISG has been met with. This issue is scored at SG80, as the elements of SG60 and 80 are clearly met but not the SG 100 elements.		
c	**Guidepost**		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

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**
	Justification	Regional Context: IOTC gives the opportunity for all stakeholders involved in the fishery to participate in key meetings. However, not all parties are interested to participate actively IOTC Secretariat takes a significant effort to encourage the participation of all parties including the financing of important stakeholders to attend meetings (scientific, etc.) and provides training to national Administration staffs and help them to improve the scientific knowledge and Administrative capacity through support and enabling and encouraging participation and integration in the activities of the IOTC. In reference to EU and EC processes consultation add that the main consultation process is established through the Advisory Council of Long Distance (LDRAC). National Context: SFA participates in the IOTC meeting. However, national consultation processes is not sufficient. Stakeholder consultations are held on a regular basis regarding the development of the sector. The SFA works in close collaboration with Ministry Natural Resources, Ministry of Environment and Energy, Seychelles Coast Guard, Seychelles Ports Authority, other Government institutions, fishermen and boat owners associations, NGO's as well as overseas partners. This issue is scored at SG80, as the elements of SG80 are clearly met but not the SG 100 elements.
References		» FAO Council 1993.The Agreement for the Establishment of the Indian Ocean Tuna Commission. Hundred and Fifth Session in Rome on 25 November 1993. http://www.iotc.org/English/info/mission.php » Seychelles Fisheries Act Chapter 82. http://faolex.fao.org/docs/pdf/sey2117.pdf » Establishment Act of Seychelles Fisheries Authority Chapter 214 http://www.sfa.sc/Legislations/SFA%20Establishment%20Act.pdf » IOTC (2013). Collection of Active Conservation and Management Measures for the Indian Ocean Tuna Commission. http://www.iotc.org/English/resolutions.php
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

Evaluation table for PI 3.1.3 All UoCs

PI 3.1.3		**The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.

PI 3.1.3		**The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach**		
	Met?	Yes	Yes	Partial

	Justification	The main objective of IOTC, as reflected in its establishment Agreement: “The Commission shall promote cooperation among its Members with a view to ensuring, through appropriate management, the conservation and optimum utilization of stocks covered by this Agreement and encouraging sustainable development of fisheries based on such stocks”. Based in this, the way of IOTC since its establishment has been as clear objective to incorporate the most appropriate measures to achieve a long-term sustainable fishery. For this, Long-Term objectives are really included, as a whole, in the IOTC Conservation and Management Measures. In this case, given that IOTC is the higher level management it was considered only the Regional level but not National level. In reference to the consistency of the IOTC measures with MSC Principles and Criteria and If the management policy incorporates the precautionary approach, some IOTC Resolutions show this reality. So Resolution 12/01 specified to apply the precautionary approach, in accordance with relevant internationally agreed standards, in particular with the guidelines set forth in the UNFSA, and to ensure the sustainable utilization of fisheries resources as set forth in Article V of the IOTC Agreement. Resolution 13/10 and Recommendation 12/14 establishes limit reference points as part of a precautionary approach. Furthermore, there are evidences to apply precautionary approach and ecosystem based management in IOTC resolutions including by catch reduction program or monitoring of ecosystem indicators. For this, long-term objectives consistent with MSC Principles and Criteria and the precautionary approach are implemented in this fishery. According to SG100 definition for PI3.1.3, there should be Long-Term objectives implemented in the fishery that guide the decision-making, which are also consistent with MSC Principles and Criteria and the precautionary approach. Furthermore some of this Long Term objectives’ are required to be explicit within and required by management policy. Management of tuna fisheries is implemented by IOTC in regional context. National level management it is not considered to be included in regional management. There are explicit reference to precautionary approach in IOTC (2001) Resolution 12/01 and the implementation of this with subsequent resolutions. The precautionary approach includes the adoption of interim target and limit reference points and IOTC Recommendations13/10 and 12/14 on interim target and limit reference points. These measures establish clear and explicit requirements though being considered "interim" can be understood as "partially required". The Final report of last IOTC Commission meeting held in Colombo, May 2014 includes in the performance review panel, in reference to adoption of precautionary approach, that this task is considered “Partially Completed”. The Commission addressed this matter through the adoption of Resolution 12/01 on the implementation of the precautionary approach. Some elements of Precautionary Approach were also adopted in Resolution 13/10 on interim target and limit reference point and a decision framework. http://www.iotc.org/documents/report-eighteenth-session-indian-ocean-tuna-commission There are evidence to apply precautionary approach and ecosystem based management in IOTC resolutions including bycatch reduction program and monitoring of ecosystem indicators and on interim target and limit reference points and a decision framework. If well, while it is true that the target and limit reference points for each of the stocks covered by the certification should be reviewed and that there are no clear well defined harvest control rule that encapsulate the precautionary principle, both tools are being developed and / or implemented. Furthermore, the IOTC are implementing the analytical tool Management Strategy Evaluation (MSE) which integrates inter alia, the precautionary principle and will serve to establish new HCR better adapted to current management objectives. http://www.iotc.org/documents/kobe-plots-and-using-uncertainty-mse-process For this, it is considered that this PI clearly exceeds the SG80 since there are specific long-term management tools and designed under the precautionary principle. However awarding full score at SG100 is not appropriate as those are currently only required for some specific elements of the management policy and therefore are considered as being "partially required" justifying a score of 85.

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach
References	» FAO Council 1993.The Agreement for the Establishment of the Indian Ocean Tuna Commission. Hundred and Fifth Session in Rome on 25 November 1993. http://www.iotc.org/English/info/mission.php » IOTC (2014) RECOMMENDATION 12/14 ON INTERIM TARGET AND LIMIT REFERENCE POINTS » IOTC (2010) RESOLUTION 13/10 ON INTERIM TARGET AND LIMIT REFERENCE POINTS AND A DECISION FRAMEWORK » IOTC (2001) RESOLUTION 12/01 ON THE IMPLEMENTATION OF THE PRECAUTIONARY APPROACH » IOTC (2013). Collection of Active Conservation and Management Measures for the Indian Ocean Tuna Commission. http://www.iotc.org/English/resolutions.php
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 3.1.4 All UoCs

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Yes	Partial	No

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing
	Justification	RFMOs, have not specific policies on incentives for sustainable practices if well the management of fisheries in a common umbrella provides benefits for the parties involved, not only for the authorities of the coastal countries but also for users. If well, really, this kind of incentives is not clearly specified in the objectives of the IOTC must be taken in account and in general, are consistent with achieving the outcomes expressed by MSC Principles 1 and 2. Cooperation between members is very important to improve management measures and this will benefit all parties. Compliance committee Terms of Reference (Resolution 10/09) shall develop a scheme of incentives and sanctions and a mechanism for their application to encourage compliance by all CPCs. However, currently this has not happened. In other hand, in the past, some perverse economic incentives of some countries could contribute to increase fishing capacity included for Indian Ocean vessel tuna fleets. Some of the bigger vessel that they are operating actually was built with economic subsidies. Currently, can't be considered that these past subsidies adversely affecting the performance of the fishery because there management measures regulating fishing capacity. There aren't economic incentives through IOTC. However, European Union fleet involved in these fisheries currently don't have economic subsidies except only in some cases for project related to improving fisheries sustainability. Regulation (eu) no 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund includes Article 11 not eligible under the EMFF, the following operations (among other): » operations increasing the fishing capacity of a vessel or equipment increasing the ability of a vessel to find fish; » the construction of new fishing vessels or the importation of fishing vessels » Seychelles don't have subsidies that contribute to unsustainable fishing. We consider that IOTC Resolution 10.09 is pending deployment. Reviewing the IOTC-2014-1D S18-07 Rev - Performance Review update, the assessment team notes that there Remains a need to setup a scheme of incentives and penalties. Therefore this PI is scored at 75, and a condition is required.
References		» FAO Council 1993.The Agreement for the Establishment of the Indian Ocean Tuna Commission. Hundred and Fifth Session in Rome on 25 November 1993. http://www.iotc.org/English/info/mission.php » IOTC (2009) RESOLUTION 10/09 CONCERNING THE FUNCTIONS OF THE COMPLIANCE COMMITTEE » REGULATION (EU) No 508/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 May 2014 on the European Maritime and Fisheries Fund and repealing Council Regulations (EC) No 2328/2003, (EC) No 861/2006, (EC) No 1198/2006 and (EC) No 791/2007 and Regulation (EU) No 1255/2011 of the European Parliament and of the Council » Fisheries Partnership Agreement between the European Community and the Republic of the Seychelles Official Journal L 290 , 20/10/2006 P. 0002 - 0005 » Agreement on fisheries between the European Economic Community and Republic of Seychelles Official Journal of the European Union. Entry into: force 10 May 2003 » Seychelles Fisheries Act Chapter 82. http://faolex.fao.org/docs/pdf/sey2117.pdf » IOTC (2013). Collection of Active Conservation and Management Measures for the Indian Ocean Tuna Commission. http://www.iotc.org/English/resolutions.php
OVERALL PERFORMANCE INDICATOR SCORE:		**75**
CONDITION NUMBER (if relevant):		**9**

Evaluation table for PI 3.2.1 All UoCs

PI 3.2.1		**The fishery 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	**Guidepost**	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's 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's 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's management system.
	Met?	Yes	Partial	No
	Justification	Fisheries objectives are not well defined in general. Some reference points associated to interim values have been adopted for several IOTC stocks through the IOTC Resolution 13/10 and Recommendation 12/14. Despite of this lack of defined management objectives in this moment, must take into account the set of interim objectives existing, which could be derived from the IOTC convention text, other international agreements to which IOTC is bound (e.g. UNCLOS), and recent IOTC resolutions and recommendations. Structure of the Kobe plot usually applied in the IOTC and used the Reference point existing, taking account of the following objectives: » for stocks which assessed status will match with the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks in a high probability within this quadrant; » for stocks which assessed status will match with the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with a high probability in as short a period as possible; » for stocks which assessed status will match with the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible; » for stocks which assessed status will match with the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible Some objectives dare consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 are explicit within the fishery's management system. Bmsy/Fmsy objectives are well defined if well, but currently some IOTC Resolutions make specific reference to the precautionary approach and to long-term sustainable utilization of tuna stocks. In the national context, there does not appear to be any short-term objectives explicit designed to achieve the outcomes expressed by MSC's Principles 1 and 2. Seychelles, as member of IOTC, adopts the management measures proposes by IOTC but don't have a management plan with short-terms objectives included.		
References		» FAO Council 1993.The Agreement for the Establishment of the Indian Ocean Tuna Commission. Hundred and Fifth Session in Rome on 25 November 1993. http://www.iotc.org/English/info/mission.php » United Nations Convention on the Law of the Sea of 10 December 1982 (UNCLOS). http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf » I. Mosqueira, T. Kitakado (2012) Working towards the evaluation of reference points and harvest control rules for IOTC stocks. 4th Session of the IOTC Working Party on Methods. IOTC–2012–WPM04–04 » IOTC (2014) RECOMMENDATION 12/14 ON INTERIM TARGET AND LIMIT REFERENCE POINTS		

PI 3.2.1	The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2
	» IOTC (2010) RESOLUTION 13/10 ON INTERIM TARGET AND LIMIT REFERENCE POINTS AND A DECISION FRAMEWORK » IOTC (2001) RESOLUTION 12/01 ON THE IMPLEMENTATION OF THE PRECAUTIONARY APPROACH » IOTC (2013). Collection of Active Conservation and Management Measures for the Indian Ocean Tuna Commission. http://www.iotc.org/English/resolutions.php
OVERALL PERFORMANCE INDICATOR SCORE:	**70**
CONDITION NUMBER (if relevant):	**10**

Evaluation table for PI 3.2.2 All UoCs

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 under assessment.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	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	

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 under assessment.
	Justification	The specific management system for this fishery has established decision-making processes that result in measures and strategies to achieve specific objectives. The rules and procedures of the IOTC establish the mechanisms by which each member may vote to adopt new measures and strategies, as well as, approval, objection procedure, implementation and compliance. In reference to National context, the Government of Seychelles, through SFA, has a long-term policy of for the fishing industry based in the "promotion of sustainable & responsible fisheries development & optimization of the benefits from this sector for present and future generations". The SFA works in close collaboration with Ministry Natural Resources, Ministry of Environment and Energy, Seychelles Coast Guard, Seychelles Ports Authority, other Government institutions, fishermen and boat owners associations, NGO's as well as overseas partners. Stakeholder consultations are held on a regular basis regarding the development of the sector. In IOTC context, from the available scientific information, the process of decision making is organized as follows: • Report of the Scientific Committee is circulated to all Members, who initiate a period of internal consultation with their scientists • Recommendations are considered and translated, when necessary, to proposals for CMMs • Briefings are prepared by national administrations (internal consultation), to define the positon of the delegations on various maters • Necessity for action on other areas (e.g. Compliance, combat of IUU fishing) are also included in the briefings consolidating the positon of the national delegations • At the Annual Session, maters are raised and negotiated seeking, when possible, consensus in the action • Binding Resolutions are adopted during the Session, as well as non-binding recommendations **There are two Types of Decisions (Article IX):** • Recommendations (voluntary and/or transitional) • Resolutions (binding) – after 120 days following the Executive Secretary's notification **Approval Process:** • Consensus process or majority consensus approach • Voting Process – two thirds majority of those present and voting • Voting Process (Rule IX of Rules of procedure) • Show of hands • By roll call (requested by a member) • Secret ballot (requested by a member and seconded by another member) **Objection process (Article X)** • Any member of the Commission may, within 120 days object to a Management measure and shall not be bound by the measure. • Any other member may within 60 days from the expiry of the 120 days object to any management measure • If objections to a measure adopted under above is more than a 1/3, the other members shal not be bound but shall not preclude any other members from giving it effect. • Any member can withdraw its objection and be bound by the measure at any time.

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 under assessment.		
		Therefore, the elements of SG60 and 80 are met for this issue. Implementation and compliance: • Upon return from the Annual Session, each delegation briefs higher authorities on the outcomes • The need for changes in the domestic legislation arising from any agreed measure is evaluated, and action is taken to modify legislation as necessary • Contacts are established with other agencies and institutions that could be responsible for implementation of some of the actions (e.g. Port Authority, provincial authorities) • Meeting with stakeholders are scheduled to brief them on the outcomes of the Commission Session and their consequences at the domestic level • Monitoring and reporting of activities to the IOTC • Secretariat proceeds inter-sessional according to the agreed schedule of reporting • Level of compliance is indicative of the effectiveness of the Commission This SG issues met at SG80.		
b	**Guidepost**	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Yes	Yes	No
	Justification	The difficulty to rate this SI is based on the effective implementation of resolutions and recommendations adopted within the IOTC by all parties. The mechanisms of the IOTC support the conclusion that all issues identified in the fishery are taken into account in the decision making process. However, effective implementation of the same does not always occur at 100%. The IOTC is able to respond effectively to all problems arising from the management but the degree of implementation is not always complete. Therefore, we do not consider this evidence for this issue meets the requirements for SG100 but it does meet the SG80 according to the provisions of MSC CR CB4.8 For the Europe Union Seychelles and it is considered that the decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions but not the case for all parts of the IOTC and therefore this issue only reaches SG80 level.		
c	**Guidepost**		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Yes	

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 under assessment.		
	Justification	The IOTC has repeatedly stressed the importance of using best available scientific information, in conjunction with sound and clear scientific advice in support of the IOTC decision making process for the conservation and management of tuna species. IOTC use the best scientific information as basis for making decisions and to elaborate the management fishery Resolutions. IOTC take into account the precautionary approach and this is used in practice under most circumstances intake of decisions. We believe that the decision-making process IOTC is always based on the best scientific information available. The application of the precautionary principle should be considered from the IOTC Resolution 12/01. Resolutions 12/01 on the implementation of the precautionary approach and 13/10 on interim target and limit reference points and a decision framework, make possible the implementation of the precautionary approach thanks to the adoption of interim target and limit reference points. Different Resolutions and recommendation were adopted within the IOTC, from Resolution 12/01, which refers to the application of this principle. • Resolution 14/02 For the conservation and management of tropical tunas stocks in the IOTC area of competence • Resolution 14/03 On enhancing the dialogue between fisheries scientists and managers • Resolution 13/04 On the conservation of cetaceans • Resolution 13/05 On the conservation of whale sharks (Rhincodon typus) • Resolution 13/06 On a scientific and management framework on the Conservation of sharks species caught in association with IOTC managed fisheries • Resolution 13/08 Procedures on a fish aggregating devices (FADs) management plan, including more detailed specification of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species • Resolution 13/09 On the conservation of albacore caught in the IOTC area of competence • Resolution 13/10 On interim target and limit reference points and a decision framework • Resolution 13/11 On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna and non-targeted species caught by purse seine vessels in the IOTC area of competence This SG issue meets the requirements of the SG80 level.		
d	Guidepost	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery 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 fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Yes	Yes	Yes

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 under assessment.		
	Justification	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions. IOTC formally publish all relevant information from the work of the organization at different levels. Thus, both published recommendations for research, monitoring, evaluation and performance review reports and plenary meetings organized. All information is public and available to all interested parties via the website of the organization. For SG100d, The IOTC has the appropriate consultation mechanisms that involve all stakeholders and dissemination and results and reports. Through meetings, workshops, work parties and other events, scientific information and management schemes are developed with the participation of all parties. The information is properly disseminated to all stakeholders and can also be viewed and downloaded from the website of the Commission. http://www.iotc.org/.The different meetings and its results can be viewed on the website of meetings of the IOTC: http://www.iotc.org/meetings SG100 is reached for scoring issue d.		
e	Guidepost	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
	Justification	The regional management level (IOTC) incorporate formal dispute resolution procedure in regional level (Article XXIII of the Agreement of IOTC covers “Interpretation and Settlement of Disputes”) in two levels. First one through conciliation procedure between the parts to be adopted by the Commission and if the dispute is not settled, it may be referred to the International Court of Justice in accordance with the Statute of the International Court of Justice. The mechanism is transparent; but given the lack of disputes it not may be argued that the system is proactive in dealing with potential disputes. At the National management level, Seychelles Fisheries Act provides the possibility to appeal some decision against the refusal, suspension, cancellation, or variation of the fishing vessels license conditions but only in this case. It isn't a proactive system. This issue e. meets the requirements of SG 60 and 80, but not 100.		
References		» FAO Council 1993.The Agreement for the Establishment of the Indian Ocean Tuna Commission. Hundred and Fifth Session in Rome on 25 November 1993. http://www.iotc.org/English/info/mission.php » United Nations Convention on the Law of the Sea of 10 December 1982 (UNCLOS). http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf » Seychelles Fisheries Act Chapter 82. http://faolex.fao.org/docs/pdf/sey2117.pdf » Establishment Act of Seychelles Fisheries Authority Chapter 214 http://www.sfa.sc/Legislations/SFA%20Establishment%20Act.pdf » SFA (2005) For the Sustainable and Responsible Development of the Fishing Industry. The Fisheries Policy of Seychelles » IOTC (2013). Collection of Active Conservation and Management Measures for the Indian Ocean Tuna Commission. http://www.iotc.org/English/resolutions.php		

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 under assessment.**
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 3.2.3

PI 3.2.3		**Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Yes	Yes	No
	Justification	For this fisheries there are three different umbrellas related with monitoring, control and surveillance issues. And these three components must be analysed jointly for scoring this PI. In a Regional level, IOTC don't have implemented a MCS system which has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. IOTC has a Compliance Committee as advisory body of the Commission. The main activities of the Compliance Committee are as follows: Review all aspects of CPCs individual compliance with IOTC Conservation and Management Measures; Review information relevant to compliance from IOTC subsidiary bodies and from Reports of Implementation submitted by CPCs, To identify and discuss problems related to the effective implementation of, and compliance with, IOTC Conservation and Management Measures, and to make recommendations to the Commission on how to address these problems. But, this CC can be considered as a system yet. IOTC don't have own mechanism to perform MCS activities. CPCs are those who must carry out these activities. The EU and Seychelles in the case of the fishery under assessment. In Europe, all ships are constantly monitored through satellite. Catches and landing are heavily monitored through observers program and electronic log-book. The MCS system, in this case has demonstrated an ability to enforce relevant management measures, strategies and/or rules. The Monitoring and Control Unit is composed of the Fisheries Monitoring Centre (FMC) and the Fisheries Control Unit. FMC deals with the compliance of all fishing vessel's reporting requirements, Vessel Monitoring System (VMS), validation of statistical documents for ICCAT, IOTC, EU and Non-EU catch certificates. The Fisheries Control Unit is responsible for the processing of fishing licences. The Enforcement Unit carries out all inspectorate duties with regards to port state inspection, land inspection, sea and air surveillance duties pertaining to national and regional requirements. SFA has an observer program for the vessels with national flag and foreign that fishing in its waters. This SG issues met at SG80 but not SG100 because there is not a comprehensive MCS system implemented in the region by IOTC		
b	**Guidepost**	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

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
	Justification	For IOTC, sanctions to deal with non-compliance exist and there is some evidence that they are applied. This is a function of the Compliance Committee. For EU fleet the sanction related with non-compliance is consistently applied and demonstrably provide effective deterrence. For Seychelles fleet, sanctions exist and are consistently applied. SFA port state control has been one of the strong points of Seychelles even before the creation of the MCS section. Despite this fact the overall approach to port state control was reviewed in 2009, concentrating on an investigative rather than an informative approach. The results have been positive since several infractions have since been detected. The results have been positive since then with detection of infractions and in one case it resulted the capturing of the Sri Lankan flag fishing vessel Lucky Too in 2012. The vessel was fined SCR 100,000.00 This SG issues met at SG80		
c	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Yes	Yes	No
	Justification	The Compliance Committee of the IOTC is responsible for tracking the degree of compliance with the different parties involved in this fishery. CC monitors compliance with recommendations and it is responsible for analysing and solving problems related to compliance. The primary responsibility of the Compliance Committee is to monitor compliance with respect to implementation of IOTC Conservation and Management Measures by CPCs. The monitoring is conducted through the assessment of reports provided by CPCs. 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. This SG issues met at SG80		
d	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		Yes	
	Justification	There is not any evidence showing systematic non-compliance. This SG issues met at SG80		
References		» Establishment Act of Seychelles Fisheries Authority Chapter 214 http://www.sfa.sc/Legislations/SFA%20Establishment%20Act.pdf » SFA (2005) For the Sustainable and Responsible Development of the Fishing Industry. The Fisheries Policy of Seychelles		

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with
	» IOTC (2013). Collection of Active Conservation and Management Measures for the Indian Ocean Tuna Commission. http://www.iotc.org/English/resolutions.php » Seychelles Fisheries Act Chapter 82. http://faolex.fao.org/docs/pdf/sey2117.pdf » IOTC. COMPLIANCE COMMITTEE Roles and Duties http://www.iotc.org/compliance/coc » IOTC (2009) RESOLUTION 10/09 CONCERNING THE FUNCTIONS OF THE COMPLIANCE COMMITTEE » IOTC (2004) RESOLUTION 11/04 ON A REGIONAL OBSERVER SCHEME
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

Evaluation table for PI 3.2.4

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	Yes	Yes	No

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
	Justification	IOTC co-ordinates and supports an extensive range of research into Indian ocean tuna stocks and fisheries – see http://www.iotc.org/science. Research into Indian ocean tuna fisheries is largely co-ordinated by IOTC, and is driven by management needs for information which is communicated to the Scientific Committee, which in turn makes research recommendations. The primary functions of the Scientific Committee and its Working Parties are to provide the Commission with the information it needs to manage fish stocks under the IOTC mandate, as well as the ecosystems in which the fisheries operate. The set of research recommendations from the SC is based on strategic review of information needs as well as analysis of data needs. The research priorities identified are considered to meet with a dynamic research plan that responds to the needs of management and which is considered appropriate in the context of achieving the objectives consistent with MSC's Principles 1 and 2. The current workplan of the Scientific Committee which sets out research recommendations and priorities for IOTC working parties in 2013 and 2014 is available here IOTC SC workplan 2013-2014 The scientific committee has, among other duties, develop and coordinate cooperative research programs Involving Members of the Commission and other interested parties, in support of fisheries management. The scientific committee is proactive, anticipatory and works to identify gaps in knowledge. Research areas are identified according to management needs for information and are highlighted and prioritised. Research undertakings follow a workplan that is endorsed by the Scientific Committee at each annual meeting of the IOTC. In addition, the IOTC has numerous research programs currently in progress: » CSIRO Australia: Wealth from oceans » MADE Project » UMR 212 "écosystèmes marins exploités" » IRD's monitoring of the tuna purse seiners operating in the Indian and Atlantic Oceans » CLIOTP global program while other research programmes have already been completed. IOTC Working Parties provide the SC with analyses of the situation of the stocks as well as an assessment of possible management actions. The members of the IOTC Scientific Committee to provide information about the catches of different species as well as information relating to by catch and more. Moreover, in the EU there are different fisheries research institutes (IEO, AZTI, etc.) conducting research of fisheries in the IOTC area where European vessels are involved. The results of these investigations are discussed in the meetings of the SC and serve to develop recommendations and the decision-making process. The Seychelles Fishing Authority integrates and applies all recommendations of the IOTC and contributes to implementing research work as required by IOTC resolution and as a contracting party to IOTC. The SC reviews the research activities carried out at a regional and national level and measures progress in the various areas including issues and data collection related to MSC P1 and P2. Although there is no comprehensive research plan, the assessment team considers that this indicator reaches the SG80 requirement.		
b	Guidepost	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	Yes	Yes	Yes

PI 3.2.4		The fishery has a research plan that addresses the information needs of management
	Justification	The research results are disseminated to all interested parties through IOTC web page where it is possible unload all the reports in pdf format. Both the report of the Scientific Committee and other reports and related articles are published once elaborated and consensual in a timely fashion. In other hand, Scientific papers related with IOTC fisheries are published periodically in journals contributing to dissemination results beyond the interested parties of the IOTC EU and the SFA publicly disseminate the results of their research and the results of the resolutions of the IOTC. This SG issues met at SG60, 80 and100 levels.
References		» Establishment Act of Seychelles Fisheries Authority Chapter 214 http://www.sfa.sc/Legislations/SFA%20Establishment%20Act.pdf » SFA (2005) For the Sustainable and Responsible Development of the Fishing Industry. The Fisheries Policy of Seychelles » IOTC (2013). Collection of Active Conservation and Management Measures for the Indian Ocean Tuna Commission. http://www.iotc.org/English/resolutions.php » Seychelles Fisheries Act Chapter 82. http://faolex.fao.org/docs/pdf/sey2117.pdf » IOTC. SCIENTIFIC COMMITTEE Roles and Duties. http://www.iotc.org/science/scientific-committee
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

Evaluation table for PI 3.2.5

PI 3.2.5		**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	**Guidepost**	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Yes	Yes	No
	Justification	IOTC has implemented mechanisms to evaluate all parts of the management system by means of various committees and working groups that meet regularly, and report their advances to the Commission. Furthermore through Performance Review Panel (PRP) has also evaluated all parts of the management system. However, in the Seychelles there are some mechanisms to evaluate key parts of the management system but not all areas are covered. Although, since the management of these fisheries is shared with the IOTC, the assessment considers that the evidence achieves SG 60 and 80 for this indicator		
b	**Guidepost**	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

PI 3.2.5		**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**
	Justification	IOTC is subject to regular and permanent internal review. This is demonstrated by the various committees and working groups that meet regularly and report their findings to the Commission. Performance Review Panel (PRP) has also evaluated all parts of the management system. Last update on progress regarding IOTC resolution 09/01 – on the performance review follow-up, indicates that External experts (Invited Experts) are regularly invited to provide additional expertise at Working Party meetings, although this does not constitute a formal process of peer review it does meet with the requirement to have occasional external review. In response to calls from the international community for a review of the performance of Regional Fisheries Management Organisations (RFMOs), the Indian Ocean Tuna Commission (IOTC) agreed in 2007 to implement a process of Performance Review. The IOTC formed a Review Panel, consisting of an independent legal expert, an independent scientific expert, six IOTC Members and a non-governmental organisations observer, which concluded its report to the Commission in January 2009. The Panel's review was based on the criteria developed as a result of a joint meeting of tuna RFMOs, Kobe, Japan, 2007. The report of the performance review is available here. In response ongoing requirements for performance review, the IOTC decided that a second Performance Review of the IOTC be undertaken in 2014, with terms of reference to be developed by interested CPCs and circulated for wider agreement via an IOTC Circular. » IOTC Circular 2014-09: Terms of Reference for implementation and criteria to conduct the second performance review of the IOTC At its 18th Session in 2014, the Commission endorsed a set of Terms of Reference and criteria to conduct the 2nd Performance Review of the IOTC and agreed on a process to start undertaking the review in 2014. The composition of the Panel will be as follows, with the IOTC Secretariat acting as facilitator of the process: » Chair with appropriate background » Contracting Parties from coastal States: Maldives, Mauritius, Oman and Seychelles » Contracting Parties from DWFN: European Union and Japan » Science expert (To be decided by the Panel Members) » NGOs: PEW and ISSF » Members from other RFMO's: WCPFC and ICCAT Terms of Reference and criteria to conduct the 2nd performance review of the IOTC The elements for scoring issue b are considered met at SG80.
References		» Establishment Act of Seychelles Fisheries Authority Chapter 214 http://www.sfa.sc/Legislations/SFA%20Establishment%20Act.pdf » SFA (2005) For the Sustainable and Responsible Development of the Fishing Industry. The Fisheries Policy of Seychelles » IOTC (2013). Collection of Active Conservation and Management Measures for the Indian Ocean Tuna Commission. http://www.iotc.org/English/resolutions.php » Seychelles Fisheries Act Chapter 82. http://faolex.fao.org/docs/pdf/sey2117.pdf

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

Appendix 1.2 Risk Based Framework (RBF) Outputs

Appendix 1.2.1 Scale Intensity Consequence Analysis (SICA)

Table 1.2.1.a SICA Scoring Template for PI 2.1.1 Retained Species [Only one subcomponent representing the worst plausible case is selected and scored] (Reference: CR Table CC3)

Table CC4: SICA Scoring Template for PI 2.1.1 Retained Species

Performance Indicator	Risk-causing activities from fishery under assessment	Spatial scale of activity	Temporal scale of activity	Intensity of activities	Relevant subcomponents	Consequence score	MSC Score
PRINCIPLE TWO: Retained Species Outcome Species: Oceanic whitetip + Silky shark	• Fishing • Gear loss • Bait collection • Other identified risk-causing activities (please specify)	1	6	2	Population size	2	80
					Reproductive capacity		
					Age/size/sex structure		
					Geographic range		
Rationale for selecting worst plausible case scenario	teleost fish abundance marlin assessed, sharks are data deficient, bycatch in FAD fishery is high						
Rationale for Spatial scale of activity	few vessels, large transoceanic stocks						
Rationale for Temporal scale of activity	Some level of activity, every day.						
Rationale for Intensity of activity	Combination of Spatial scale + temporal scale						
Rationale for choosing most vulnerable sub-component	Shark species are (in the main) slow growing, low fecund, late maturing						
Rationale for Consequence score	possible detectable change in size, minimal impact						

Table 1.2.1.b SICA Scoring Template for PI 2.1.1 Retained Species [Only one subcomponent representing the worst plausible case is selected and scored] (Reference: CR Table CC3)

Table CC4: SICA Scoring Template for PI 2.1.1 Retained Species

Performance Indicator	Risk-causing activities from fishery under assessment	Spatial scale of activity	Temporal scale of activity	Intensity of activities	Relevant subcomponents	Consequence score	MSC Score
PRINCIPLE TWO: Retained Species Outcome Species: FAL (C. falciformis)	• Fishing • Gear loss • Bait collection • Other identified risk-causing activities (please specify)	2	6	2	Population size		
					Reproductive capacity	1	1 (80)
					Age/size/sex structure		
					Geographic range		
Rationale for selecting worst plausible case scenario	Due to low REPRODUCTIVE POTENTIAL OF SHARKS IN GENERAL, WHICH AFFECT THE REST OF PARAMETERS						
Rationale for Spatial scale of activity	FREE SCHOOL IS RESTRICTED TO WESTERN TROPICAL NARROW BAND WHICH DOES NOT OVERLAP WITH THE WHOLE SILKY SHARK POPULATION DISTRIBUTION.						
Rationale for Temporal scale of activity	BASED ON FISHERY DATA FROM UK PS FLEET.						
Rationale for Intensity of activity	BASICALLY DUE TO 1) LOW OVERLAP BETWEEN FLEET ACTIVITY & POPULATION DISTRIBUTION and (2) LOW CATCH OF SILKY IN FREE SCHOOL FISHING						
Rationale for choosing most vulnerable sub-component							
Rationale for Consequence score	BECAUSE THE IMPACT OF THOSE PARTICULAR 6 PS FISHING IN FREE SCHOOL IS VERY LOW DUE TO THE REASON HIGHLIGHTED ABOVE: 1) LOW OVERLAP, 2) LOW AVAILABILITY and 3) LOW CATCH						

Table 1.2.1.c SICA Scoring Template for PI 2.1.1 Retained Species [Only one subcomponent representing the worst plausible case is selected and scored] (Reference: CR Table CC3)

SICA - FREESCHOOL

Table CC4: SICA Scoring Template for PI 2.1.1 Retained Species

Performance Indicator	Risk-causing activities from fishery under assessment	Spatial scale of activity	Temporal scale of activity	Intensity of activities	Relevant subcomponents	Consequence score	MSC Score
PRINCIPLE TWO: Retained Species Outcome Species: SILKY SHARK	• Fishing • Gear loss • Bait collection • Other identified risk-causing activities (please specify)	1	6	2	Population size	2	80
					Reproductive capacity		
					Age/size/sex structure		
					Geographic range		
Rationale for selecting worst plausible case scenario	MAIN RISK CAUSING ACTIVITY IS PURSE SEINING WHICH LEADS TO MORTALITY EXPECTED FOR FAL LOW REPRODUCTIVE POTENTIAL MEAN SHARKS ARE VULNERABLE						
Rationale for Spatial scale of activity	FEW VESSELS FISHING FREESCHOOLS, FAD USED FOR MOST CATCH 80-100%						
Rationale for Temporal scale of activity	SOME P/S SET LIMITED EFFORT ONLY VERY RARE						
Rationale for Intensity of activity	OVERALL LOW INTENSITY.						
Rationale for choosing most vulnerable sub-component	SMALL SPECIMENS (LOW VALUE) RETAINED BUT LARGER WITH RELEASED (SOME MORTALITY)						
Rationale for Consequence score	POSSIBLE DETECTION OF POPULATION SIZE, REC CONSIDERED UNLIKELY						

Table CC2 – summary of main risk causing activities

Table CC2 Pro forma table for hazard identification (risk analysis)

Direct impact of Fishing	Fishing Activity	Present (yes/no)	Rationale
Capture	Bait collection	N	PURSE SEINE
	Fishing	Y	LEADS TO CAPTURE MORTALITY
	Incidental behaviour	N	NONE RELEVANT
Direct impact without capture	Bait collection	N	PURSE SEINE GEARS
	Fishing	Y	MAY CAUSE INJURY
	Incidental behaviour	N	NONE
	Gear loss	N	NO GEAR LOSS
	Anchoring/ mooring	N	NO ANCHORING
	Navigation/steaming	N	NO RISK ASSOC
Addition/ movement of biological material	Translocation of species (boat launching, reballasting)	N	NO TRANSLOCATION
	Discarding catch	Y	RISK TO SPECIMENS DISCARDED
	Stock enhancement	N	NO ENHANCEMENT
	Provisioning	N	NO ASSOC. RISK
Disturb physical processes	Bait collection	N	PURSE SEINE GEARS
	Fishing	~~Y~~ N	NOT RISK ASSOC.
	Boat launching	N	NOT RELEVANT
	Anchoring/ mooring	N	NO ANCHORING
	Navigation/ steaming	Y	NO ASSOC RISK
External Hazards (specify the particular example within each activity area)	Other capture fishery methods E.G LONGLINE	Y	NO ASSOC RISK

Appendix 1.3 Conditions

There are 10 conditions for this fishery.

Condition 1 Yellowfin tuna

Performance Indicator	1.1.2 Limit and target reference points are appropriate for the stock
Score	75
Rationale	80 level PISG 'The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity' is not met with for scoring issue B. Resolution 13/10 sets interim target (BMSY and FMSY) and limit (BLIM = 0.40 BMSY and FLIM = 1.40 FMSY) reference points for yellowfin tuna. No rationale is available to support these choices. Concerning the target stock level, and noting that while BMSY, B2010, and B0 are unknown, both SB2010/SB0 = 0.38 [0.28 – 0.38] and SB2010/SBMSY = 1.24 [0.91– 1.40] have been determined. Based on these values the best estimate of SBMSY/SB0 is 0.31 Resolution 13/10 provides that BLIM = 0.40 BMSY implying an SBLIM/SB0 of 0.12. Noting CB2.3.3.4, a value of 0.20 might be more prudent. Although the IOTC has yet to adopt a specific limit reference point, management advice is provided relative to MSY as a target. The default 50% BMSY is assumed here for purposes of defining stock status. However, the lack of a well-defined point indicates that the SG80 is not met.
Condition	By year 4: Demonstrate that the limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.
Milestones	Year 2: Identify and test appropriate limit reference point(s). Score 75 Year 3: Client to actively and demonstrably promote the adoption of the appropriate Limit reference Points within EU and IOTC. Score 75 Year 4: LRP adopted by IOTC. Rescoring of the PI and scoring issue B will be carried out only once the 4th annual milestone has been met with and is expected to meet with SG80 PISG's. NOTE: The limit reference points established for this stock must be consistent with the requirements of MSC CR1.3 PI 1.1.2a, including relevant notes (e.g. CB2.33.4) and Guidance.
Client action plan	Target and limit reference points, and harvest control rules (HRC), and how they are used in a management framework, are very important tools in modern fisheries management. Pesqueras Echebastar vessels are registered in PVR (Pro-active Vessel Register) ISSF. And ISSF urges the IOTC to adopt 100% observer coverage on its tropical tuna purse seine fleet. The Seychelles Fishing Authority has accepted to provide the necessary human component support to Pesqueras Echebastar for the purpose of 100% observer coverage of tuna purse seine vessels, fishing in the Indian Ocean. Both have signed a MOA (Memorandum of Agreement). Since January of 2014, the observers are recording data for both, target and bycatch species. Pesqueras Echebastar in agreement with all Spanish purse seiner owners operating in the Indian Ocean, has signed also the compromise of 100% observes coverage by January 2015. Therefore Echebastar is one year ahead of this agreement. With these data and scientific samplings from observers onboard, Pesqueras Echebastar actively collaborates with research centres (IEO and AZTI, IOTC members and ISSF). Pesqueras Echebastar has research collaboration agreements with the universities of Basque Country and Las Palmas de Gran Canarias. Pesqueras Echebastar promotes and contributes to projects such as: 1) "Strategic plan on science and technology for sustainable management of tropical Tuna vessels" of Spanish Government (schedule 2013-2015, AZTI and IEO are the scientific members). 2) "Evaluation of management strategies for template tunas and tropical tuna" of Basque Country Government (AZTI scientific members). Year 2: AZTI and IEO are working actively, following the work plan proposed in the projects, to find limit and target reference points appropriated for the stock. Pesqueras Echebastar will keep recorded all the documents regarding the agreements signed with SFA, AZTI and IEO to improve the LRP. Year 3: Pesqueras Echebastar, according to the criteria of scientific bodies, will actively promote actions to implement the appropriate LRP within EU and IOTC. These actions will be recorded and documented by the company. Year 4: With full collaboration of the consultation scientific organizations reach to the demonstration that the LRP is set above the level, at which there is an appreciable risk of impairing reproductive capacity.
Consultation on condition	Consultation organizations are and will be: AZTI (IOTC scientific consultation member), IEO (IOTC scientific consultation member), Seychelles Fishing Authority (IOTC scientific consultation member), Seychelles National Observers Organization, Seychelles Ministry of Fisheries, Indian Ocean Tuna Commission (Seychelles), Secretaría General de Pesca (Spain).

Condition 2 Yellowfin tuna

Performance Indicator	1.2.2 There are well defined and effective harvest control rules in place
Score	60
Rationale	80 level PISG's are not met with for scoring issues A "*Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached*"; B "*The selection of the harvest control rules takes into account the main uncertainties*" or C "*Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules*". A defined harvest control rule is essential if managers are to successfully adjust the exploitation rate appropriately as the reference points approached. Currently the HCR for this stock is not well defined. Whereas uncertainties are taken into account in the stock assessment, given the lack of a defined HCR, it cannot be said that these uncertainties are taken into account in the HCR. Whereas the IOTC is investigation/deploying tools such as catch and/or effort limits and spatial/temporal closures, as there is no clearly defined HCR it cannot be said to be either appropriate or effective in achieving the appropriate exploitation levels.
Condition	By year 4: An appropriate Harvest Control Rule shall be tested and agreed by IOTC.
Milestones	Year 2: Define and test appropriate harvest control for stock. While a proper evaluation of a harvest control rule is best done as part of an MSE this may not be necessary in every case. Nor should the time necessary to undertake a full MSE - in particular of complex HCRs - preclude the adoption of less complex approaches in the short term For example the *de facto* HCR recommended by IATTC staff is that fishing mortality should be reduced to Fmsy if it exceeds that level. Score 60 Year 3: Client to actively and demonstrably promote the adoption of the appropriate Harvest Control Rule that takes into account uncertainty within EU and IOTC. Score 60 Year 4: HCR adopted by IOTC. Rescoring of PI 1.2.2 (all scoring issues) will be carried out after the HCR has been adopted but no later than at fourth annual surveillance. Score 80.
Client action plan	HCRs are a set of well-defined management actions to be taken in response to changes in stock status with respect to target and limit reference points. Pesqueras Echebastar shares the ISSF opinion that the adoption of HCRs is a key aspect of modern fisheries management. ISSF supports the recommendations of the IOTC Scientific Committee to implement and fund a process of familiarization and capacity building amongst CPCs at multiples levels, including dialogue among scientists, managers and stakeholders related to the formulation of management objectives and holding of workshops focused on providing assistance to developing CPCs. In the project "Evaluation of management strategies for template tunas and tropical tuna" of Basque Country Government (AZTI scientific members), the main objective is the development and propose reference points for the proper management of the three tuna species (SKJ,YFT, BET) and impact assessment in Indian ocean fisheries. Echebastar will provide all the information available to feed the definition of LRP and the HCR framework. Echebastar will also contribute to co-fund the implementation of this initiative. The tasks of performed in collaboration with AZTI are: Year 1: AZTI will Propose interim limit reference points (LRP) for three species (SKJ, YFT, and BET). AZTI will select reference points consistent with the management of the species of interest and will evaluate their implementation. These LRPs will be developed by models of population dynamics and of fisheries production worked by AZTI members. The results will be shown through scientific documentation. Year 2: AZTI will Investigate the existing HCR and will study, will define and will test, with the new limit reference points, changes in the HCR The main objective is to find appropriate harvest control for stock. The results will be shown through scientific documentation. Year 3-4: Echebastar, in collaboration with AZTI, will propose robust HCR and Limit and Target Reference Points for the three tropical species. Pesqueras Echebastar actively will promote actions to implement the appropriate HCRs within EU, Seychelles and IOTC. These proposes and actions will be documented by Echebastar
Consultation	Consultation organizations are and will be: AZTI (IOTC scientific consultation member), IEO (IOTC scientific consultation member), Seychelles National Observers Organization, Seychelles Ministry of Fisheries, Indian Ocean Tuna Commission (Seychelles), Secretaría General de Pesca (Spain).International Seafood Sustainability Foundation (ISSF).

Condition 3 Skipjack tuna

Performance Indicator	1.1.2 Limit and target reference points are appropriate for the stock
Score	75
Rationale	80 level PISG '*The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity*' is not met with for scoring issue B. In resolution 13/10 the IOTC adopted interim target (BMSY and FMSY) and limit (BLIM = 0.40 BMSY and FLIM = 1.50 FMSY) reference points for skipjack tuna. The resolution specifies that the IOTC Scientific Committee should assess stocks against these reference points and provide advice against them, as is done both in tabular form and using Kobe process presentations. The resolution also calls on the Scientific Committee to further investigate reference points and Harvest Control Rules (HCR) using Management Strategy Evaluation (MSE). Stock assessments for skipjack are well advanced (see IOTC–2012–WPTT14) and though results are uncertain the influence of alternative assumptions and model approaches is explored. The target reference points for this stock have been set as ratios: B/BMSY and F/FMSY. This is reasonable and consistent with practice elsewhere as well as with MSC requirements. The reference points are estimated based on MSY and are appropriate for tuna stocks. MSY is estimated within the stock assessment and reported to the management system. The relation of the stock relative to MSY is reported as part of the determination of stock status: the SG80 is met.
Condition	By year 4: Demonstrate that the limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.
Milestones	Year 2: Identify and test appropriate limit reference point(s). Score 75 Year 3: Client to actively and demonstrably promote the adoption of the appropriate Limit reference Points within EU and IOTC. Score 75 Year 4: LRP adopted by IOTC. Rescoring of the PI and scoring issue B will be carried out only once the 4th annual milestone has been met with and is expected to meet with SG80 PISG's. NOTE: The limit reference points established for this stock must be consistent with the requirements of MSC CR1.3 PI 1.1.2a, including relevant notes (e.g. CB2.33.4) and Guidance.
Client action plan	Target and limit reference points, and harvest control rules (HRC), and how they are used in a management framework, are very important tools in modern fisheries management. Pesqueras Echebastar vessels are registered in PVR (Pro-active Vessel Register) ISSF. And ISSF urges the IOTC to adopt 100% observer coverage on its tropical tuna purse seine fleet. The Seychelles Fishing Authority has accepted to provide the necessary human component support to Pesqueras Echebastar for the purpose of 100% observer coverage of tuna purse seine vessels, fishing in the Indian Ocean. Both have signed a MOA (Memorandum of Agreement). Since January of 2014, the observers are recording data for both, target and bycatch species. Pesqueras Echebastar in agreement with all Spanish purse seiner owners operating in the Indian Ocean, has signed also the compromise of 100% observes coverage by January 2015. Therefore Echebastar is one year ahead of this agreement. With these data and scientific samplings from observers onboard, Pesqueras Echebastar actively collaborates with research centres (IEO and AZTI, IOTC members and ISSF). Also have research collaboration agreements with the universities of Basque Country and Las Palmas de Gran Canarias. Pesqueras Echebastar promotes and contributes to projects such as: 1) "Strategic plan on science and technology for sustainable management of tropical Tuna vessels" of Spanish Government (schedule 2013-2015, AZTI and IEO are the scientific members). 2) "Evaluation of management strategies for template tunas and tropical tuna" of Basque Country Government (AZTI scientific members). Year 2: AZTI and IEO are working actively, following the work plan proposed in the projects, to find limit and target reference points appropriated for the stock. Pesqueras Echebastar will keep recorded all the documents regarding the agreements signed with SFA, AZTI and IEO to improve the LRP. Year 3: Pesqueras Echebastar, according to the criteria of scientific bodies, will actively promote actions to implement the appropriate LRP within EU and IOTC. These actions will be recorded and documented by the company. Year 4: With full collaboration of the consultation scientific organizations reach to the demonstration that the LRP is set above the level, at which there is an appreciable risk of impairing reproductive capacity.
Consultation	Consultation organizations are and will be: AZTI (IOTC scientific consultation member), IEO (IOTC scientific consultation member), Seychelles Fishing Authority (IOTC scientific consultation member), Seychelles National Observers Organization,

Performance Indicator	1.1.2 Limit and target reference points are appropriate for the stock
	Seychelles Ministry of Fisheries, Indian Ocean Tuna Commission (Seychelles), Secretaría General de Pesca (Spain).

Condition 4 Skipjack tuna

Performance Indicator	1.2.2 There are well defined and effective harvest control rules in place
Score	60
Rationale	80 level PISG's are not met with for scoring issues A "*Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached*"; B "*The selection of the harvest control rules takes into account the main uncertainties*" or C "*Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules*". A defined harvest control rule is essential if managers are to successfully adjust the exploitation rate appropriately as the reference points approached. Currently the HCR for this stock is not well defined. Whereas uncertainties are taken into account in the stock assessment, given the lack of a defined HCR, it cannot be said that these uncertainties are taken into account in the HCR. Whereas the IOTC is investigation/deploying tools such as catch and/or effort limits and spatial/temporal closures, as there is no clearly defined HCR it cannot be said to be either appropriate or effective in achieving the appropriate exploitation levels.
Condition	By year 4: An appropriate Harvest Control Rule should be tested and agreed by IOTC.
Milestones	Year 2: Complete current MSE and agree appropriate HCR that takes into account uncertainty. Score 60 Year 3: Client to actively and demonstrably promote the adoption of the appropriate Harvest Control Rule within EU and IOTC. Score 60 Year 4: HCR adopted by IOTC. Rescoring of PI 1.2.2 (all scoring issues) will be carried out after the HCR has been adopted but no later than at fourth annual surveillance. Score 80.
Client action plan	HCRs are a set of well-defined management actions to be taken in response to changes in stock status with respect to target and limit reference points. Pesqueras Echebastar shares the ISSF opinion that the adoption of HCRs is a key aspect of modern fisheries management. ISSF supports the recommendations of the IOTC Scientific Committee to implement and fund a process of familiarization and capacity building amongst CPCs at multiples levels, including dialogue among scientists, managers and stakeholders related to the formulation of management objectives and holding of workshops focused on providing assistance to developing CPCs. In the project "Evaluation of management strategies for template tunas and tropical tuna" of Basque Country Government (AZTI scientific members), the main objective is the development and propose reference points for the proper management of the three tuna species (SKJ,YFT, BET) and impact assessment in Indian ocean fisheries. Echebastar will provide all the information available to feed the definition of LRP and the HCR framework. Echebastar will also contribute to co-fund the implementation of this initiative. The tasks of performed in collaboration with AZTI are: Year 1: AZTI will propose interim limit reference points (LRP) for three species (SKJ, YFT, and BET). AZTI will select reference points consistent with the management of the species of interest and will evaluate their implementation. These LRPs will be developed by models of population dynamics and of fisheries production worked by AZTI members. The results will be shown through scientific documentation. Year 2: AZTI will Investigate the existing HCR and will study, will define and will test, with the new limit reference points, changes in the HCR The main objective is to find appropriate harvest control for stock. The results will be shown through scientific documentation. Year 3-4: Echebastar, in collaboration with AZTI, will propose robust HCR and Limit and Target Reference Points for the three tropical species. Pesqueras Echebastar actively will promote actions to implement the appropriate HCRs within EU, Seychelles and IOTC. These proposals and actions will be documented by Echebastar.
Consultation	Consultation organizations are and will be: AZTI (IOTC scientific consultation member), IEO (IOTC scientific consultation member), Seychelles Fishing Authority (IOTC scientific consultation member), Seychelles National Observers Organization,

Performance Indicator	1.2.2 There are well defined and effective harvest control rules in place
	Seychelles Ministry of Fisheries, Indian Ocean Tuna Commission (Seychelles), Secretaría General de Pesca (Spain).International Seafood Sustainability Foundation (ISSF)

Condition 5 Bigeye tuna

Performance Indicator	1.1.2 Limit and target reference points are appropriate for the stock
Score	75
Rationale	80 level PISG '*The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity*' is not met with for scoring issue B. Resolution 13/10 sets interim target (BMSY and FMSY) and limit (BLIM = 0.40 BMSY and FLIM = 1.50 FMSY) reference points for bigeye tuna. No rationale is available to support these choices. Concerning the target stock level, and noting that while for big eye tuna neither BMSY, B2011, nor B1950 (=B0) are unknown, both SB2011/SB1950 (=SB0) = 0.45 [0.25 – 0.665] and SB2011/SBMSY = 1.2 [1.01– 1.43] have been determined. Based on these values the best estimate of SBMSY/SB0 is 0.375 Resolution 13/10 provides that BLIM = 0.40 BMSY implying an SBLIM/SB0 of 0.15. Noting CB2.3.3.4, a value of 0.20 might be more prudent. Although the IOTC has yet to adopt a specific limit reference point, management advice is provided relative to MSY as a target. The default 50% BMSY is assumed here for purposes of defining stock status. However, the lack of a well-defined point indicates that the SG80 is not met.
Condition	By year 4: Demonstrate that the limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.
Milestones	Year 2: Identify and test appropriate limit reference point(s). Score 75. Year 3: Client to actively and demonstrably promote the adoption of the appropriate Limit reference Points within EU and IOTC. Score 75. Year 4: LRP adopted by IOTC. Rescoring of the PI and scoring issue B will be carried out only once the 4th annual milestone has been met with and is expected to meet with SG80 PISG's. NOTE: The limit reference points established for this stock must be consistent with the requirements of MSC CR1.3 PI 1.1.2a, including relevant notes (e.g. CB2.33.4) and Guidance.
Client action plan	Target and limit reference points, and harvest control rules (HRC), and how they are used in a management framework, are very important tools in modern fisheries management. Pesqueras Echebastar vessels are registered in PVR (Pro-active Vessel Register) ISSF. And ISSF urges the IOTC to adopt 100% observer coverage on its tropical tuna purse seine fleet. The Seychelles Fishing Authority has accepted to provide the necessary human component support to Pesqueras Echebastar for the purpose of 100% observer coverage of tuna purse seine vessels, fishing in the Indian Ocean. Both have signed a MOA (Memorandum of Agreement). Since January of 2014, the observers are recording data for both, target and bycatch species. Pesqueras Echebastar in agreement with all Spanish purse seiner owners operating in the Indian Ocean, has signed also the compromise of 100% observes coverage by January 2015. Therefore Echebastar is one year ahead of this agreement. With these data and scientific samplings from observers onboard, Pesqueras Echebastar actively collaborates with research centres (IEO and AZTI, IOTC members and ISSF). Pesqueras Echebastar also has research collaboration agreements with the universities of Basque Country and Las Palmas de Gran Canarias. Pesqueras Echebastar promotes and contributes to projects such as: 1) "Strategic plan on science and technology for sustainable management of tropical Tuna vessels" of Spanish Government (schedule 2013-2015, AZTI and IEO are the scientific members). 2) "Evaluation of management strategies for template tunas and tropical tuna" of Basque Country Government (AZTI scientific members). Year 2: AZTI and IEO are working actively, following the work plan proposed in the projects, to find limit and target reference points appropriated for the stock. Pesqueras Echebastar will keep recorded all the documents regarding the agreements signed with SFA, AZTI and IEO to improve the LRP. Year 3: Pesqueras Echebastar, according to the criteria of scientific bodies, will actively promote actions to implement the appropriate LRP within EU and IOTC. These actions will be recorded and documented by the company. Year 4: With full collaboration of the consultation scientific organizations reach to the demonstration that the LRP is set above the level, at which there is an appreciable risk of impairing reproductive capacity.

Consultation	Consultation organizations are and will be: AZTI (IOTC scientific consultation member), IEO (IOTC scientific consultation member), Seychelles Fishing Authority (IOTC scientific consultation member), Seychelles National Observers Organization, Seychelles Ministry of Fisheries, Indian Ocean Tuna Commission (Seychelles), Secretaría General de Pesca (Spain)

Condition 6 Bigeye tuna

Performance Indicator	**1.2.2 There are well defined and effective harvest control rules in place**
Score	60
Rationale	80 level PISG's are not met with for scoring issues A "*Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached*"; B "*The selection of the harvest control rules takes into account the main uncertainties*" or C "*Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules*". A defined harvest control rule is essential if managers are to successfully adjust the exploitation rate appropriately as the reference points approached. Currently the HCR for this stock is not well defined. Whereas uncertainties are taken into account in the stock assessment, given the lack of a defined HCR, it cannot be said that these uncertainties are taken into account in the HCR. Whereas the IOTC is investigation/deploying tools such as catch and/or effort limits and spatial/temporal closures, as there is no clearly defined HCR it cannot be said to be either appropriate or effective in achieving the appropriate exploitation levels.
Condition	By year 4: An appropriate Harvest Control Rule should be tested and agreed by IOTC.
Milestones	Year 2: Define and test appropriate harvest control rule for the stock that takes into account uncertainty. While a proper evaluation of a harvest control rule is best done as part of an MSE this may not be necessary in every case. Nor should the time necessary to undertake a full MSE - in particular of complex HCRs - preclude the adoption of less complex approaches in the short term For example the *de facto* HCR recommended by IATTC staff is that fishing mortality should be reduced to Fmsy if it exceeds that level. Score 60. Year 3: Client to actively and demonstrably promote the adoption of the appropriate Harvest Control Rule within EU and IOTC. Score 60. Year 4: HCR adopted by IOTC. Rescoring of PI 1.2.2 (all scoring issues) will be carried out after the HCR has been adopted but no later than at fourth annual surveillance. Score 80.
Client action plan	HCRs are a set of well-defined management actions to be taken in response to changes in stock status with respect to target and limit reference points. Pesqueras Echebastar shares the ISSF opinion that the adoption of HCRs is a key aspect of modern fisheries management. ISSF supports the recommendations of the IOTC Scientific Committee to implement and fund a process of familiarization and capacity building amongst CPCs at multiples levels, including dialogue among scientists, managers and stakeholders related to the formulation of management objectives and holding of workshops focused on providing assistance to developing CPCs. In the project "Evaluation of management strategies for template tunas and tropical tuna" of Basque Country Government (AZTI scientific members), the main objective is the development and propose reference points for the proper management of the three tuna species (SKJ,YFT, BET) and impact assessment in Indian ocean fisheries. Echebastar will provide all the information available to feed the definition of LRP and the HCR framework. Echebastar will also contribute to co-fund the implementation of this initiative. The tasks of performed in collaboration with AZTI are: Year 1: AZTI will Propose interim limit reference points (LRP) for three species (SKJ, YFT, and BET). AZTI will select reference points consistent with the management of the species of interest and will evaluate their implementation. These LRPs will be developed by models of population dynamics and of fisheries production worked by AZTI members. The results will be shown through scientific documentation. Year 2: AZTI will Investigate the existing HCR and will study, will define and will test, with the new limit reference points, changes in the HCR The main objective is to find appropriate harvest control for stock. The results will be shown through scientific documentation. Year 3-4: Echebastar, in collaboration with AZTI, will propose robust HCR and Limit and Target Reference Points for the three tropical species. Pesqueras Echebastar actively will promote actions to implement the appropriate HCRs within EU, Seychelles and IOTC. These proposes and actions will be documented by Echebastar.

Performance Indicator	1.2.2 There are well defined and effective harvest control rules in place
Consultation	Consultation organizations are and will be: AZTI (IOTC scientific consultation member), IEO (IOTC scientific consultation member), Seychelles National Observers Organization, Seychelles Ministry of Fisheries, Indian Ocean Tuna Commission (Seychelles), Secretaría General de Pesca (Spain).International Seafood Sustainability Foundation (ISSF)

Condition 7 All UoCs

Performance Indicator	2.1.3 Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species
Score	75
Rationale	SG80 PISG for scoring issue C has not been met with: *'Information is adequate to support a partial strategy to manage main retained species'*. Information is considered adequate in relation to retained tuna catch and supports a partial strategy to manage impacts on bigeye, yellowfin and skipjack tuna. However, both silky shark and oceanic white tip shark are known to feature as bycatch in the fishery, along with other vulnerable retained species including some ray species. Both species are considered vulnerable to population impacts through bycatch in commercial fisheries. Recent collection of information on bycatches of these species does not support ongoing management of stocks of shark and ray species and is not adequate to fully understand (and monitor) the specific impact that the freeschool fishery may be having on these species. While the fishing operation does not allow for accurate catch sorting, there are opportunities for improving the recording of data in relation to bycatch of sharks and other vulnerable species.
Condition	Detailed recording and reporting of shark bycatch should be carried out for all freeschool sets onboard all vessels that are part of the certification. Recording and reporting should be verifiable and the use of independent observers should be considered to this end.
Milestones	Year 1: Devise catch sampling plan for freeschool sets as well as sampling protocols and standards that provide information of use to future evaluation and ongoing monitoring of impacts on vulnerable species. This should include full reporting in terms of species, sex, capture location, size and fate. Score 75 Year 2: Demonstrate that full recording of vulnerable species bycatch has been implemented on all vessels included under the certification. Score 75 Years 3 - 4: Continue recording of vulnerable species bycatch and report all catches as per IOTC Resolution and bycatch reporting protocols. Recording and reporting should be verifiable and validated by an independent means. Rescoring will take place at fourth annual surveillance audit – score 80.
Client action plan	Year 1: This fishery is generally considered to be highly selective. The observers of SFA and AZTI, with Echebastar data, will improve the monitoring of catch and by-catch to better understand the status and trends of retained species within the purse seine catch. Pesqueras Echebastar has 100% observer coverage on board of their vessels during 100% of time , and the level of observer coverage will be documented and reported for the annual MSC surveillance audit The observers of SFA and internal staff will undertake survey of bycatch and discards, with sufficient detail (species, sex, capture location, size and fate) to enable quantification of species composition and total catch and vulnerable species bycatch. It will be recommended to engage with research entities (AZTI and IEO) for the analysis of these data collected by the observers. Also; Pesqueras Echebastar has implemented some internal actions for reduction of bycatch and specially ETP species: » The implementation and development of a second conveyor belt for the maximum possible of bycatch to be returned back to the sea, alive. » Design and construction of a more selective prototype of purse seine net. » Convert the maximum possible of the present bycatch, in target fish (ultra-frozen) with commercial value. Staff Training. Since 2009, the skippers and crew of Pesqueras Echebastar attend, at least, to one of the annual workshops of ISSF for ETP species and bycatch reduction (Sukarrieta, Spain). These workshops consist in good practices to reduce the mortality of sharks and rays caught incidentally by tropical tuna purse seiners. Also, Pesqueras Echebastar contributes to the strategic plans and scientific projects implemented in the scientific organizations (AZTI and IEO) to get data through scientific sampling, and improve the knowledge and management of bycatch. Within the strategic plan of the Spanish government to Promote research activities needed to improve scientific knowledge of marine ecosystems of which they are part (ETPs, bycatch) "Strategic plan on science and technology for sustainable management of tropical tuna vessels".

Performance Indicator	2.1.3 Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species
	The association ANABAC-OPTUC, of which Pesqueras Echebastar is a member, funds together with the association OPAGAC-AGAC a project led by the marine and food research institute AZTI, with the goal of developing a system of verification of the code good practices in the tuna purse seine fishery. The goal of the code of good practices is to reduce the eco-systemic impact of the fishery, in particular on protected large pelagic animals as sharks, rays, sea turtles and whale-sharks. The good practices defined in this code include: » The coverage of 100% of the fleets by observers onboard » The use of non-entangling Fish Aggregating Devices in the purse-seine fishery » -The correct application of release operations on by-caught fauna, ensuring crew safety and maximizing the survival of the animals. The boats of Pesqueras Echebastar with Spanish flag follow the obligation of landing their catches, according to the European Regulation 1380/2013 that will enter into effect on January 1st 2015. Year 2: AZTI and IEO will continue receiving data regularly to be implemented in the data collection framework http://datacollection.jrc.ec.europa.eu/ . These data will send through SFA. With this, Echebastar will demonstrate that full recording of ETP species bycatch has been implemented on all vessels included under the certification. The current observer's database will be fitted so as to store the additional information recorded by the observers and audit structures. The data will be standardized and analysed, by AZTI and IEO, for a follow-up of the compliance of the good practice code. Documental support will be provided to the observers (tutorial and forms) and to the audit structures (management handbooks, protocols in case of non-conformities, checklists). Based on the results of this first phase, additional precisions will be included into the code of good practices. These propose and actions will be documented by Echebastar. Year 3-5: Echebastar will continue recording of vulnerable species bycatch and report all catches as per IOTC Resolution and bycatch reporting protocols. AZTI is the responsible entity to verify and certify all recorded data. These actions will be documented by Echebastar Conclusions: AZTI and IEO will be : a) The responsible entity to verify and certify all recorded data. b) Ensure continuity and quality of the data. c) Analyse these data for a follow-up of the compliance of the good practice code. Echebastar: a) Echebastar will provide data. b) Echebastar will participate in all meetings for knowing about the development of the tasks defined. c) Echebastar will participate in all courses and workshops. d) All these actions will be documented by Echebastar Needless to mention Pesqueras Echebastar compliance with ISSF and IOTC Resolutions.
Consultation	Consultation organizations are and will be: AZTI (IOTC scientific consultation member) , IEO and ISSF

Condition 8 All UoCs

Performance Indicator	2.3.3 Relevant information is collected to support the management of fishery 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.
Score	75

Performance Indicator	2.3.3 Relevant information is collected to support the management of fishery 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.
Rationale	The 80 level PISG for scoring issue A requires that '*Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species*'. The assessment team consider that it would be appropriate for scoring at SG80 that specific recording of ETP interactions should be undertaken by Pesqueras Echebastar vessels during all freeschool tuna sets as part of standard onboard procedures, even where there are no interactions. Specific data for the fleet would allow fishery related impacts to be quantitatively estimated for ETP species and would help identify more clearly the risks by documenting capture rates for species, size distributions of ETP species, temporal and spatial patterns of interaction, response and outcome.
Condition	Detailed recording and reporting of ETP interactions should be carried out for all freeschool sets onboard all vessels that are part of the certification. Recording and reporting should be verifiable and the use of independent observers should be considered to this end.
Milestones	Year 1: Devise catch sampling plan for freeschool sets as well as sampling protocols and standards that provide information of use to future evaluation and ongoing monitoring of impacts on ETP species. This should include full reporting in terms of species, sex, capture location, size and fate. Score 75 Year 2: Demonstrate that full recording of ETP species bycatch has been implemented on all vessels included under the certification. Score 75 Year 3: Continue recording of ETP species interactions and report all such interactions according to IOTC Resolution and bycatch reporting protocols. Recording and reporting should be verifiable and validated by an independent means. Rescoring can take place at 4th annual surveillance where it must be demonstrated that ongoing recording is in place and is providing data to support management of ETP bycatch. Score 75 Year 4; Continue recording of ETP species interactions and report all such interactions according to IOTC Resolution and bycatch reporting protocols. Recording and reporting should be verifiable and validated by an independent means. Rescoring can take place at 4th annual surveillance where it must be demonstrated that ongoing recording is in place and is providing data to support management of ETP bycatch. Rescoring to 80 level PISG at 4th annual surveillance audit.
Client action plan	Year 1: The main ETP species which might be impacted in the purse seine fishery are sea turtles and sharks. In both cases, the chances of catching these species in this fishery are negligible. The condition to develop a periodic observer program is however justifiable. Pesqueras Echebastar has 100% observer coverage (observer by vessel) on board of their vessels during 100% of time. The observers of SFA and internal staff will undertake survey of bycatch and discards, with sufficient detail (species, sex, capture location, size and fate) to enable quantification of species composition and total catch vulnerable species bycatch. Also; Pesqueras Echebastar has implemented some internal actions for reduction of bycatch and ETPs: a) The implementation and development of a second conveyor belt for the maximum possible of bycatch to be returned back to the sea, alive. b) Design and construction of a more selective prototype of purse seine net. c) Convert the maximum possible of the present bycatch, in target fish (ultra-frozen) with commercial value. Staff Training. Since 2009, the skippers and crew of Pesqueras Echebastar attend, at least, to one of the annual workshops of ISSF for ETP species and bycatch reduction (Sukarrieta, Spain). These workshops consist in good practices to reduce the mortality of sharks and rays caught incidentally by tropical tuna purse seiners. Also, Pesqueras Echebastar contributes to the strategic plans and scientific projects implemented in the scientific organizations (AZTI and IEO) to get data through scientific sampling, and improve the knowledge and management of bycatch. Within the strategic plan of the Spanish government to Promote research activities needed to improve scientific knowledge of marine ecosystems of which they are part (ETPs, bycatch) "Strategic plan on science and technology for sustainable management of tropical tuna vessels". The association ANABAC-OPTUC, of which Pesqueras Echebastar is a member, funds together with the association OPAGAC-AGAC a project led by the marine and food research institute AZTI, with the goal of developing a system of verification of the code good practices in the tuna purse seine fishery. The goal of the code of good practices is to reduce the ecosystemic impact of the fishery, in particular on protected large pelagic animals as sharks, rays, sea turtles and whale-sharks. The good practices defined in this code include: » The coverage of 100% of the fleets by observers onboard » The use of non-entangling Fish Aggregating Devices in the purse-seine fishery. » The correct application of release operations on by-caught fauna, ensuring crew safety and maximizing the survival of the animals.

Performance Indicator	2.3.3 Relevant information is collected to support the management of fishery 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.
	To aid in the collection of data on sea turtles inadvertently captured, if flipper tags are recovered during the fishing operations, the information be made known to IOSEA at http://flippertag.loseaturtles.org/ . Additionally, Echebaster will ensure that skippers and crew on the Escebaster purse seine vessels are trained with the IATTC video on the proper procedures for handing and releaseing sea turtles. Year 2: AZTI and IEO will continue receiving data regularly to be implemented in the data collection framework http://datacollection.jrc.ec.europa.eu/. These data will send through SFA. With this, Echebastar will demonstrate that full recording of ETP species bycatch has been implemented on all vessels included under the certification. Based on historical bycatch data as well as on interviews with currently operating skippers, this phase will give a picture of the recent evolution and current situation in terms of observer presence onboard and liberation of by-caught fauna. Year 3-5: SFA will continue recording of ETP species interactions and will report all such interactions according to IOTC Resolution and bycatch reporting protocols. Recording and reporting will be verifiable and validated by AZTI and IEO. An additional formation will be provided to the observers (by workshops in AZTI, at ports or through videoconference), to make them able to identify operations of liberation of fauna. Instructions will also be provided together with the tutorials and forms, for them to properly register and convey the requested information. The current observer's database will be fitted so as to store the additional information recorded by the observers and audit structures. The data will be standardized and analysed for a follow-up of the compliance of the good practice code. Conclusions: AZTI and IEO will be : d) The responsible entity to verify and certify all recorded data. e) Ensure continuity and quality of the data. f) Analyse these data for a follow-up of the compliance of the good practice code. Echebastar: g) Echebastar will provide data. h) Echebastar will participate in all meetings for knowing about the development of the tasks defined. i) Echebastar will participate in all courses and workshops. j) All these actions will be documented by Echebastar Needless to mention Pesqueras Echebastar compliance with ISSF and IOTC Resolutions.
Consultation	Consultation organizations are and will be: AZTI (IOTC scientific consultation member) , IEO and ISSF

Condition 9 All UoCs

Performance Indicator	3.1.4 The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing
Score	75
Rationale	The 80 level PISG '*The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise*' is not fully met with. RFMOs, have not specific policies on incentives for sustainable practices if well the management of fisheries in a common umbrella provides benefits for the parties involved, not only for the authorities of the coastal countries but also for users. If well, really, this kind of incentives is not clearly specified in the objectives of the IOTC must be taken in account and in general, are consistent with achieving

Performance Indicator	3.1.4 The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing
	the outcomes expressed by MSC Principles 1 and 2. Cooperation between members is very important to improve management measures and this will benefit all parties. Compliance committee Terms of Reference (Resolution 10/09) shall develop a scheme of incentives and sanctions and a mechanism for their application to encourage compliance by all CPCs. However, currently this has not happened. In other hand, in the past, some perverse economic incentives of some countries could contribute to increase fishing capacity included for Indian Ocean vessel tuna fleets. Some of the bigger vessel that they are operating actually was built with economic subsidies. Currently, can't be considered that these past subsidies adversely affecting the performance of the fishery because there management measures regulating fishing capacity. There aren't economic incentives through IOTC. However, the European Union fleet involved in this fisheries currently do not have economic subsidies except only in some cases for project related to improving fisheries sustainability. Seychelles do not have subsidies that contribute to unsustainable fishing. IOTC Resolution 10.09 is pending deployment. Reviewing the IOTC-2014-1D S18-07 Rev - Performance Review update, considered that "There remains a need to setup a scheme of incentives and penalties".
Condition	By the second annual surveillance audit, the SG80 scoring requirements must be met. IOTC scheme of incentives and penalties should be implemented.
Milestones	Year 1- During the first annual surveillance audit, the client must submit documented evidence to the CAB that the IOTC Compliance Committee is working to develop a scheme of incentives and penalties. Score 75 Year 2- By the second annual surveillance audit, the client must submit documented evidence to the cab that the IOTC Compliance Committee has approved a scheme of incentives and penalties. If such a scheme has not been implemented, independent evidence of client efforts to promote adoption of such a scheme must be provided. Score 80. Rescoring of the PI will take place once management authorities have implemented an appropriate scheme of incentives and penalties that applies to all vessels included in the certification. This will take place no later than at the second annual surveillance.
Client action plan	Year 1: Echebastar will promote, through entities involved in the management of tuna, incentives and penalties that contribute to sustainable fishing. These actions will be documented by Echebastar Year 2: Echebastar will work, through entities involved in the management of tuna, with the intention for approving a scheme of incentives and penalties in the IOTC Compliance Committee. Echebastar with scientific identities (AZTI, IEO) and governmental entities (Seychelles and Spanish) will be proactive to support a program of incentives and penalties in the IOTC Compliance Committee. These actions (meetings and documents) will be documented by Echebastar. Year 3- Echebastar will submit documented evidence to the CAB that the incentives and penalties programs are implemented and are functioning as intended.
Consultation	Consultation organizations are and will be: Seychelles Ministry of Fisheries, Secretaria general de pesca de España, AZTI, and IEO.

Condition 10 All UoCs

Performance Indicator	3.2.1 The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2
Score	70
Rationale	Fisheries objectives are not well defined in general. Some reference points associated to interim values, have been adopted for several IOTC stocks through the IOTC Resolutions 13/10 and 12/14. Some objectives are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 and are explicit within the fishery's management system. Bmsy/Fmsy objectives are well defined and currently some IOTC Resolutions make specific reference to the precautionary approach and to long-term sustainable utilization of tuna stocks. In the national context, there does not appear to be any short-term objectives explicitly designed to achieve the outcomes expressed by MSC's Principles 1 and 2. Seychelles, as member of IOTC, adopts the management measures proposes by IOTC but don't have a management plan with short-terms objectives included.
Condition	By the fourth annual surveillance audit, the SG80 scoring requirements must be met. Short and Long-term objectives must be explicit within the fishery management system at both IOTC and Seychellois levels.

Performance Indicator	3.2.1 The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2
Milestones	Year 1- During the first annual surveillance audit, the client must submit documented evidence to the CAB that the possibility of incorporating short-term objectives for the management of fisheries in relation to fisheries for tuna purse seiners has been discussed at national level and that the client and representatives of the Government of Seychelles in the IOTC have posed this situation to the IOTC. Score 70. Year 2- In the second year audit, the client will provide the CAB with documented evidence that short-term objectives have been discussed for inclusion in management plans. Score 70. Year 3- Audit in the third year, the client should submit to CAB with documented that short-term objectives have been incorporated into management plans. Score 70. Year 4- During the fourth year surveillance audit, the client must submit to the CAB documented evidence that short-term objectives have been defined and are being taken into account in the definition of harvest strategies. By the fourth annual surveillance audit, one re-scoring of PI will be conducted to see if the SG80 is reached.
Client action plan	Pesqueras Echebastar provides continued information to research centres AZTI and IEO, as IOTC scientific members and EU (through Spanish Ministry of Agriculture, Food and Fisheries), as part of the management team in the IOTC committee. Also Pesqueras Echebastar has a close relationship with Seychelles authorities with full collaboration with Seychelles Fishing Authority and the Ministry for Investment, Natural Resources and Industry. The company actively participates in official meetings and workshops to improve limit reference points (LRP), harvest control rules (HRC) and treatment of bycatch and ETP species. Year 1: According to the above Pesqueras Echebastar will submit documented evidence to the CAB that the possibility of incorporating objectives for the management of fisheries in relation to fisheries for tuna purse seiners has been discussed national level and that Pesqueras Echebastar and representatives of the Government of Seychelles in the IOTC have posed this situation to the IOTC Year 2: Pesqueras Echebastar will provide the CAB with documented evidence that objectives have been discussed for inclusion in management plans. Year 3: Pesqueras Echebastar during the third year audit will provide to CAB, properly documented, that objectives have been incorporated into management plans. Year 4: The company will submit to CAB documented evidences that objectives have been defined and are taken into account in the definition of harvest strategies by the fourth year audit.
Consultation	Consultation organizations are and will be: Seychelles Ministry of Fisheries, Secretaria general de pesca de España, AZTI, IEO

azti tecnalia

Egoitza Nagusia / Sede Central
Txatxarramendi Ugartea z/g
E-48395 Sukarrieta - Bizkaia (Spain)
Tel.: +34 94 657 40 00 - Fax: +34 94 657 25 55

Parque Tecnológico de Bizkaia
Astondo bidea - Edificio 609
E-48160 Derio - Bizkaia (Spain)
Tel.: +34 94 657 40 00 - Fax: +34 94 657 25 55

Herrera Kaia - Portu aldea z/g
E-20110 Pasaia - Gipuzkoa (Spain)
Tel.: +34 94 657 40 00 - Fax: +34 94 657 25 55

www.azti.es
info@azti.es

D. Kepa Etxebarria
Pesqueras Echebastar SA
Muelle Erroxape, s/n
48370 Bermeo (Bizkaia)

August 8, 2014

Dear Kepa.

It is really good news to know that Echebastar has embarked on the MSC certification process. As you very well know, AZTI has been proactively working towards sustainability principles for the Basque fishing industry and we have a number of examples related to several of our paradigmatic fisheries, including purse seine fleet targeting tropical tunas in the different oceans.

In this respect, we will continue the work developed over many years towards contributing to the sustainability of the tropical tuna populations and their ecosystems. And this objective would not be possible without the collaboration of the Basque fishing industry, and Echebastar has consistently been a leading company in collaborating and promoting initiatives in this direction.

Concerning current initiatives in place to define and promote Reference Points (RPs) and Harvest Control Rules (HCRs) for tuna stocks, I must say that AZTI is trying to lead the implementation of this type of management framework in the context of ICCAT and IOTC. For example, current IOTC WPTT Chair from AZTI is a member of the Steering Committee of Skipjack Management Strategy Evaluation Project linked to Maldivian SKJ Pole and Line MSC Certification and AZTI scientists actively participated in the Working Party on Methods of IOTC. Moreover, last year AZTI scientists presented a document[1] that was the basis for initiating a dialogue on RPs and HCRs with the ICCAT Commission. The proposal included a set of

[1] Scott, G., G. Merino, H. Arrizabalaga, H. Murua, J. Santiago and V. Restrepo, 2013. A Framework for Promoting Dialogue on Parameterizing a Harvest Control Rule with Limit and Target Reference Points for North Atlantic Albacore. SCRS/2013/120.

projections under alternative provisional HCRs to decide on desired timeframes and probabilities for recovering the north Atlantic albacore stock.

This year our scientists are also leading and participating in the groups that are being created to enhance the Dialogue between Fisheries Scientists and Managers, groups that are focused on the definition and implementation of RPs and HCRs. This is partly a consequence of several projects that we have recently initiated with the collaboration of several institutions including the Basque Government and the European Union:

- 04-2012-00391 - PBRLatuna – "*Puntos biológicos de referencia limites(PBRLs) para las poblaciones de túnidos explotadas por las flotas Vascas*"
- 04-2013-00573 - Tuna-TEST: "*Evaluación de Estrategias de Ordenación de túnidos templados y túnidos tropicales*"

Our focus will continue to be the development of mechanisms to enable tuna Regional Fisheries Management Organizations, including IOTC, and stakeholders to introduce and apply HCRs for tuna stocks exploited by the Basque fleets.

As for the characterization of the catch composition of the fishing activities by the Echebastar group, we will continue with this important collaboration over the coming years. And the results of this collaboration will be presented to the scientific community of the IOTC. The collected data will be made available for the assessment of the different stocks and for the characterization of the potential impact of the purse seine activity on non-target and ETP species.

Finally AZTI will continue working on the different projects on by-catch and by-catch mitigation issues on tuna purse seine fisheries:

- GAP2 - Making a difference by enabling participatory research between stakeholders & scientists: Integration of evidence-based knowledge and its application to science and management of fisheries & marine environment
- MADE: Mitigating Adverse Impacts of Open Ocean Fisheries
- CECOFAD: Standardization of tropical tuna catch and effort time series for EU purse seine fleets using FADs in the Atlantic, Indian and Pacific Ocean and estimation of by catch and ecosystem impacts. (MARE/2012/24)

- ISSF_Workshops: Technical assistance for ISSF skipper workshops on purse seine by-catch mitigation measures 2014
- *"Discriminación acústica Campañas ISSF"*

I am certain that the collaboration with your company Echebastar will greatly assist us in addressing these challenges.

Best regards,

Dr. Rogelio Pozo
Director of AZTI-Tecnalia

D. Kepa Etxebarria
Pesqueras
Echebastar S.A.
Muelle Erroxape,
s/n
48370 Bermeo
(Vizcaya)

Spain

18 August 2014

Dear Kepa,

Regarding the activities of the Spanish Institute of Oceanography (IEO) on tropical tuna fisheries in the Indian Ocean, I have to inform you that we are currently involved in the following research projects being carried out in collaboration with Echebastar.

1.- **INDTROP** (Indian Ocean Tropical Tuna). The objectives of this Project are:

- stock assessment of species targeted by the Spanish fleet (periodical activity in IOTC working groups)
- biology and population dynamics of exploited species
- impact of anthropogenic activities on the marine ecosystem (discards, incidental mortality, etc.) and effects of fishing with FAD's

In order to fulfill the above objectives a monitoring system was established from the beginning of the fishery in 1984. This system is based on the information recorded in logbooks (coverage close to 100%) and in a sampling scheme at landing ports to estimate the specific composition of landings and the length frequency distribution of the different species in the commercial catches. Also individuals from all commercial species are routinely sample in the factories to obtain biological parameters such as individual length, individual weight, sex, sexual maturity stage, etc.

2.- **Strategic Plan for Tropical Tuna Fisheries** ("Plan estratégico de túnidos tropicales"). This is a collaborative project being carried out by the fisheries administration, the fishing industry and the research institutes. The aim is to increase the scientific knowledge needed to assure the sustainable exploitation of the tropical tuna resources and the marine ecosystem inhabited by them, encouraging the responsible fishing and the competitiveness of the Spanish fleet targeting for these resources.

3.- **FAD's Management Plan** ("Plan de Gestión de Dispositivos de Concentración de Peces (DCPs)"). This is a management plan established by the Spanish fisheries administration affecting all vessels fishing for tropical tuna species in the Atlantic, the Indian and the Pacific oceans in order to:

- improve data gathering for scientific advice
- contribute to increase the knowledge on the specific composition of catches in FADs
- increase the knowledge on the FADs in relation to their technical characteristics and their potential impact on the marine ecosystem
- establish mechanisms for the exchange of information among operators, scientists and administrators to update each other on the advances of the technology and in their eventual implications on the fisheries

4.- **Data Collection Regulation** ("Programa Nacional de Datos Básicos"). One of the main objectives of this program is to obtain information on the by-catch of the tropical tuna fleet. This was intended by establishing a scientific observation system on the 10% of the fishing trips conducted by the fleet. This program had to be suspended in 2009 due to security problems in the Indian Ocean. The program is expected to be reinitiated in the short term.

Hoping the above information is of your interest, I remain

Yours sincerely

Dr. Eduardo Balguerías Guerra
Director of the Spanish Institute of Oceanography (IEO)

Indian Ocean Tuna Commission
Commission des Thons de l'Océan Indien
iotc ctoi

20 August 2014

IOTC REF: 5528

TO WHOM IT MAY CONCERN

The Secretariat of the Indian Ocean Tuna Commission has been informed of status of the ongoing MSC certification process for Pesqueras Echebastar.

We note that the identified milestones for nine specific conditions are largely expressed as targets of the IOTC contracting member parties. However we would like to report on the recent developments in IOTC that established a process that is leading its Members towards an effective implementation of the precautionary approach, through the development of robust management strategies, that is, harvest control rules and their associated reference points

On the limit and target reference points, as well as harvest control rules, the Commission at its 18th Session adopted Resolution 14/03 to improve the dialogue among scientists and managers that is necessary to proceed with the evaluation of management strategies that would lead to a better management of tropical tunas. At its 17th Session, the Commission adopted Resolution 13/10 on interim target and limit reference points and a decision framework. The Resolution tasks the Scientific Committee to assess the robustness and the performance of the interim target and limit reference points through management strategy evaluation to work towards the adoption of species-specific reference points as soon as possible. In addition, the Resolution tasks the Scientific Committee to develop and assess potential harvest control rules (HCRs) to be applied, considering the status of the stocks against the assessed reference points for albacore, skipjack, bigeye, yellowfin and swordfish.

The IOTC also adopted Resolution 13/11 on a ban on discards of bigeye, skipjack, yellowfin and a recommendation for the non-targeted species caught by purse seine vessels in the IOTC area of competency. Procedures on FAD management plans including additional reporting requirements were adopted in Resolution 13/08.

These Resolutions, and the actions that the IOTC members are taking in response to the Resolutions, demonstrate the strong commitment of the IOTC to the process of establishing robust target and limit reference points and harvest control rules as well as other related conservation and management measures for the Indian Ocean tuna resources.

Yours faithfully,

Rondolph Payet
Executive Secretary

cc: Chairperson IOTC

Le Chantier Mall - PO Box 1011, Victoria, Seychelles. Tel: +248.4225.494 Fax: +248.4224.364 Email: secretariat@iotc.org Web: www.iotc.org

Republic of Seychelles

Ministry of Natural Resources

The Minister

20th August 2014

D. Kepa Echebarria
Pesqueras Echebastar SA
Muelle Erroxape, s/n
48370 Bermeo (Bizkaia)

Dear Kepa.

On behalf of the people and the Republic of Seychelles I would like to express our gratitude for Echebastar's novel and welcomed initiative to embark on the MSC certification process. We have been proactively working towards sustainability principles for the Seychelles fishing industry and we have a number of examples related to our three modes of fisheries being the artisanal, the semi-industrial including purse seiners fleet targeting our tropical tuna in the 1.3 million square kilometers of our Exclusive Economic Zone.

In this respect, Echebastar is a pioneer in uplifting the bar to higher standards of sustainable industrial fisheries. We endeavor to support your efforts that are in line with our own aspirations when it comes to fishing for Tuna. You bring new dynamism to the work developed over many years towards contributing to the sustainability of the tropical tuna populations and their ecosystems. We are grateful that Echebastar has consistently been a leading company in collaborating and promoting initiatives in this direction.

Concerning current initiatives in place to define and promote Reference Points (RPs) and Harvest Control Rules (HCRs) for tuna stocks Seychelles within the Indian Ocean Tuna Commission is trying to lead the implementation of this type of management framework.

Seychelles is an active member of the IOTC and our scientists and fisheries managers participates and make contribution in most of the annual forums organized by this RFMO, including the recent initiatives aimed at connecting IOTC Science and Management. Furthermore in our effort to promote responsible tuna fishing and ensure the long-term sustainability of the tuna resources in the Indian Ocean region Seychelles develop and presented various proposals for conservation and management measures at the IOTC commission meetings.

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One such proposal on prohibiting discards at sea was later adopted as a binding resolution prohibiting the discards of the 3 main targeted tropical tuna species (skipjack, yellowfin and bigeye tuna).

In our effort to promote the use of RPs and HCR's in the Indian Ocean tuna fishing the Seychelles has been at the forefront of developing proposals for the introduction of quota system based on Maximum Sustainable Yields (MSY) level recommended by the IOTC Scientific Committee. Based on the complexity of the tuna fishing within the Indian Ocean, it is very likely going to be a long process before we see the introduction of a quota system, however other HCR's need to be considered and the Seychelles is committed to remain a key player in this process.

Our focus will continue to be the development of mechanisms to enable IOTC, and stakeholders to introduce and apply HCRs for tuna stocks exploited by our fleets.
Over the last 2 decades the Seychelles have actively participated in many of the research projects aimed at more responsible tuna fishing and sustainable exploitation of tuna stock. To name a few, the EU project MADE (Mitigating Adverse Impact of Open Ocean Fisheries), FADIO (Fish Aggregating Devices as Instrumented Observatories of pelagic ecosystems), TAGFAD (Archival Tagging Operation in the Western Indian Ocean), the IOTTP (Indian Ocean Tuna Tagging Project).

Furthermore we are implementing port sampling programme to collect size frequency and specific composition data, as well as significantly enhance our at sea observer programme to collect finer scale data particularly on by-catch and discards. All those data are submitted to the IOTC on an annual basis and are used by regional scientists during IOTC Working Parties to developed Target Reference Points.

As per IOTC mandatory statistics requirement, Seychelles will introduce revised logbook to collect more finer scaled data on DFAD's deployed by Seychelles registered purse seiners and supply vessels as well as foreign vessels fishing within our waters. Along the same line, Seychelles is in the process of drafting its FAD management plan which will be presented to our partners later during the year for comments prior to submission of a final version to the IOTC.

In order to ensure a more reliable and timely data process for decision making Seychelles is to introduce electronic logbook reporting on its licensed purse seiners in the very near future. Finally, it is worth noting that my personal engagements with the Maritime Steward Council (MSC) and commitment to bring about a more sustainable fishing modality is one that has in reality began this year and is poised to grow.

In wishing you and your peers that have voluntarily embarked on this very commendable and noble mission the very best and rest assured of our full support.

Yours sincerely

Peter SINON
MINISTER

MINISTERIO
DE AGRICULTURA,
ALIMENTACIÓN Y MEDIO
AMBIENTE

SECRETARIA GENERAL DE PESCA

DIRECCIÓN GENERAL DE RECURSOS
PESQUEROS Y ACUICULTURA
SUBDIRECCIÓN GENERAL DE
ACUERDOS Y ORGANIZACIONES
REGIONALES DE PESCA

Madrid, August 13, 2014

To whom it may concern,

The Secretary General of Fisheries of Spain has been informed about the status of the ongoing MSC certification process for Pesqueras Echebastar. Regarding the identified milestones for nine specific conditions, it should be highlighted that they are mainly targets of the IOTC and its contracting member parties, rather than a feasible milestone to be achieved by the company.

Regarding limit and target reference points, as well as harvest control rules, Spain is fully committed, within the European Union as CPC of the IOTC, to improve the dialogue among scientists and managers that will provide tools for a better management of tropical tunas. In this respect, it was through a proposal by the EU, that the IOTC engaged in a process aiming to establish HCR and limit reference points for IOTC tropical tuna stocks. Besides, it also should be highlighted that Spain, as a member of the EU, is fully engaged, through the recently reformed Common Fisheries Policy, in attaining Maximum Sustainable Yield on all fisheries conducted by the EU fleet in the shortest term possible.

Spain has developed a Strategic Plan for Tropical Tunas that may respond to the achievement of the identified targets. This programme has been adopted in March 2014 and it is a collaborative effort by the Secretary General of Fisheries, the Scientific institutions (IEO and AZTI), as well as the industry (represented by ANABAC and OPAGAC associations. Pesqueras Echebastar is associated to the Strategic Plan as an associated member of ANABAC.

The Strategic Plan aims at achieving a sustainable management of tuna fishing resources in the Atlantic, Indian and Pacific Oceans, hinging on the extension to the industry of the best available science and technology. The Strategic Plan has a comprehensive set of scientific and technological actions to be carried out in the next 7 years. The Strategic Plan does also include the issue of HCR and limit reference points as one of its main focus of interest regarding scientific research by Spanish scientific institutions. With regard to the MSC identified areas, some actions are highlighted in the Strategic Plan:

- Data collection by the office of Spain located in the Indian Ocean (Seychelles).
- Development of a basic protocol for the use of statistics of fisheries.
- Reinforcement of the staff for tropical tunas of IEO and AZTI.

1

C/ Velázquez, nº 144
28006 - MADRID
TEL: 913476040
FAX: 913476049

MINISTERIO
DE AGRICULTURA,
ALIMENTACIÓN Y MEDIO
AMBIENTE

SECRETARIA GENERAL DE PESCA

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ACUERDOS Y ORGANIZACIONES
REGIONALES DE PESCA

- Biomass assessment by means independent from fisheries data.
- By catches and selectivity of gears. Special study for whale shark.
- Discards H2020. Proposal lead by IMARES, with a study on tropical tunas lead by AZTI

Deputy General Director
for Agreements and RFMOs

SECRETARIA GENERAL DE PESCA

Carlos Moreno Blanco

2

C/ Velázquez, nº 144
28006 - MADRID
TEL: 913476040
FAX: 913476049

SEYCHELLES FISHING AUTHORITY

Please address all Correspondence to the Chief Executive Officer.

Date: Tuesday 12th August 2014

TO WHOM IT MAY CONCERN

RE: OBSERVER COVERAGE ON ECHEBASTER/ HARTSWATER PURSE SEINE FLEET FISHING IN THE INDIAN OCEAN

In my capacity as Chief Fisheries Officer in the Fisheries Management Division of the Seychelles Fishing Authority and as the Coordinator of the Seychelles National Scientific Observer programme, I hereby certify that the Seychelles Fishing Authority, as an independent organization, has concluded an agreement with Echebastar/Hartswater fishing companies for a 100% observer coverage on their tuna purse seine vessels operating within the Indian Ocean.

The agreement was concluded in January 2014 and to date all fishing trips (20) undertaken so far by the named fishing companies have been covered by observers from the Seychelles Fishing Authority. Electronic data and observer reports are compiled for each trip and the protocol being used are the same developed by the French Research Institute (IRD).

Please do not hesitate to get in touch for any further enquiry on my email address (vlucas@sfa.sc)

Thanking you for your co-operation.

Yours sincerely

Vincent Lucas (Mr.)
Chief Fisheries Officer
For Chief Executive Officer

International Year of Small Island Developing States:
Seychelles A Determined Island Nation

Responsible Fishing For Sustainability

Appendix 2. Peer Review Reports

Peer Reviewer 1

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	Yes/No No	Certification Body Response
Justification: There is a very large issue of traceability in this fishery since there is mixing of tunas on board vessels from the units of certification and from outside the unit of certification. This particularly worrying since the unit of certification is only 20% of the catch. How will the client address this?		**FCI Response:** the team have identified and acknowledged the issue, however it is not for the team to detail how the client will address or resolve this issue. The issue of traceability has been identified during the assessment and clear reference has been made to the nature and extent of the traceability issue in Section 5 of the report. Free school caught tuna will not be eligible to enter MSC chains of custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels.

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	Yes/No No	Certification Body Response
Justification: The conditions do not seem to follow the requirements of CR 27.11. Particularly 27.11.1.2 that they do not all follow the metric of the SG being addressed; the milestones are not all measurable and none include outcomes as to whether any rescoring will happen as a result of achieving the milestone (CR 27.11.1.4)		**FCI Response:** The conditions have been reviewed on foot of the comment and changes have been made in a number of cases where condition setting was found not to follow the metric of the scoring guide being addressed. Not all milestones are measurable in absolute terms due to the nature of some of the milestones that require the client organisation to engage in lobbying or promotion of improvements to management and/or sustainability through contact with relevant management authorities. Despite this, all annual milestones can be audited in the context of identifying whether or not progress has been made towards meeting with the PISG at SG80. Indications of when re-scoring may be carried out at the latest are included in each condition.

If included:

Do you think the client action plan is sufficient to close the conditions raised?	Yes/No No	Certification Body Response
Justification: The CAB should not accept an action plan that relies on the involvement of fisheries management or research agencies without their consultation. (CR 27.11.3). The action plan is focused on the observer program that would collect the information but who is going to do the analysis required to determine outcomes and impacts? And have they agreed?		**FCI Response:** all agencies referred to in the CAP for each condition have been consulted by the client as part of CAP development. Confirmation of roles in improving management of Indian Ocean tuna and / or assisting the client organisation in delivering on the CAP undertakings are provided in supporting letters included in Appendix 1.3

General Comments on the Assessment Report (optional)

This report covers only three of the six units of certification identified by notice of November 2013. I assume there is a separate report for the FAD units. The report is silent on what happened to the other units.

FCI Response: The report presents the results of the assessment and scoring of three of the six Units of Certification initially entering into assessment. Future additional reporting may follow with respect to remaining UoC's.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
1.1.1	YFT: Yes SKJ:Yes BET: Yes	YFT: Yes SKJ:Yes BET: Yes			FCI Response: the Peer Reviewer comments are noted.
1.1.2	YFT: Yes SKJ:Yes BET: Yes	YFT: Yes SKJ:Yes BET: Yes	No	The condition should follow the requirements of the CR 27.11. Milestones should be measurable and any outcomes or scores noted if milestones achieved. I didn't see any evidence to support that the client consulted with the research agency as required by CR 27.11.3.	FCI Response: Issues of uncertainty are now specifically considered in section 3.3.4.4) particularly in respect of errors in the estimation of the stock status, and (ii) the estimation of MSY itself. This section considers uncertainty, the use of Btrigger, and IOTC resolution 14/07 which seeks to standardise the presentation of scientific information (and uncertainty) in the annual scientific committee report as well as working party reports. Specifically it notes that for a number of tuna RFMOs (including IOTC) Bmsy is, by convention, set as a target. This is not however incompatible with the SG80 requirement that the target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome *provided that* uncertainty is addressed and incorporated into the advice and (ii) is acted on accordingly. This is the case for this stock. Conversely it is NOT compatible with the SG100 which requires that the target reference point is such that the stock is, not alone, maintained at a level consistent with BMSY (or some measure or surrogate with similar intent or outcome, or a higher level) but also takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
1.1.3	N/A	N/A			
1.2.1	YFT: Yes SKJ:Yes BET: Yes	YFT: Yes SKJ:Yes BET: Yes			FCI Response: the Peer Reviewer comments are noted.
1.2.2	YFT: Yes SKJ:Yes BET: Yes	YFT: Yes SKJ:Yes BET: Yes	No	The condition should follow the requirements of the CR 27.11. The goal is to have a well-fined and effective HCR in place, not necessarily to seek "an appropriate HCR should be tested and agreed by IOTC". Also milestones should be measurable and any outcomes or scores noted if milestones achieved. I didn't see any evidence to support that the client consulted with the research agency as required by CR 27.11.3.	FCI Response: See section 3.3.4.2 (new) IOTC RES 12/13 explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ. The resolution also includes specification for testing the effectiveness of the measure, regarded as a pilot. That testing was carried out in a timely fashion by independent analysts (IOTC-2011-SC14-40) which found the limited, pilot measures insufficient to control exploitation but noted how extended measures could help to control exploitation, not so much by controlling catch volume but through improvements to the exploitation pattern (i.e. by reducing the selectivity of juvenile Yellowfin). Consideration of the spatial/temporal measures is also included in IOTC-2012-WPTT14-R[E]. It should be noted in this context that GCB 2.6.4 makes clear that control of exploitation rates need not be restricted to the use of HCR that respond directly to population size but might also, e.g., involve reducing exploitation rate on parts of the stock (as in the case of RES 12/13). Overall, the IOTC has demonstrated the ability via resolution to use

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
					spatial/temporal closures and intent to understand how these can be effective at controlling exploitation. This constitutes some evidence of use of an appropriate tool to control exploitation and to understand the efficacy of the tool. The IOTC has a long history of resolutions aimed at limiting effort/capacity. These include IOTC RES01/04, 03/01, 06/05, 09/02, and 12/11. Early resolutions were aimed at non-members but were soon extended to all Contracting Parties and Cooperating non-members (CPC). The most recent resolution, IOTC RES12/11, is aimed at determining fishing capacity for all IOTC CPC, to ensure stabilisation of the level of fishing capacity active on stocks of high commercial value (including yellowfin tuna). The resolution provides for planned fleet development and vessel replacement but is aimed at ensuring no effective increase in capacity from a 2006 baseline plus any agreed Fishery Development Plans (FDP) for the years 2007-2013. In addition, the IOTC has an ongoing process to develop a catch allocation scheme and has already developed allocation principles. IOTC RES 13/10 and the MSE research planning and contracting, and IOTC MSE workshop reports (C2_WK_MSE_REPORT), together with work on allocation (IOTC-2011-SS4-PropA[E], IOTC-2011-SS4-PropB[E], IOTC-2013-TCAC02-R[E]) clearly demonstrates the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction, though as of Nov 2013 these have not yet been used.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
					On the basis of the foregoing there is clearly some evidence that tools used to implement harvest control rules have been introduced by the IOTC, that they are appropriate and that they have been effective in controlling exploitation.
1.2.3	YFT: Yes SKJ:Yes BET: Yes	YFT: Yes SKJ:Yes BET: Yes			FCI Response: the Peer Reviewer comments are noted.
1.2.4	YFT: Yes SKJ:Yes BET: Yes	YFT: Yes SKJ:Yes BET: Yes			FCI Response: the Peer Reviewer comments are noted.
2.1.1	YFT: Yes SKJ:Yes BET: Yes	YFT: Yes SKJ:Yes BET: Yes			FCI Response: the Peer Reviewer comments are noted.
2.1.2	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.
2.1.3	Yes	Yes	No	Milestones should include any re-scoring as a result of meeting the milestone. (CR	FCI Response: the Peer Reviewer comments are noted. Milestones are included and rescoring timelines are now indicated. The PI being scored is 2.1.3 - scoring issue C was found not to meet with the 80 level PISG 'Information is

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
				27.11.1.4c) The work planned here will include collecting the data, which has been agreed by the SFA with the observer program but the second part is to analyse the data ad determine risk. Who will do that and have they agreed to do it? I didn't see any evidence to support that the client consulted with a research agency as required by CR 27.11.3.	adequate to support a partial strategy to manage main retained species'. The requirement is that information be available in relation to retained species bycatch, including that of vulnerable species including some sharks. The condition is worded to require that understanding of levels of interaction be improved. It is not for the team to specify who must undertake what task in setting a condition, but merely to identify the shortcoming and the annual milestones required to be achieved in meeting with the 80 level PISG. By way of response to the condition, the client has proposed that improved retained catch data be collected through an onboard observer programme and that such data be analysed with assistance from a scientific organisation. This response is given in the CAP. This is considered to be an appropriate response and both the response and the text of the condition are in keeping with rules for condition setting. Relevant research agencies have been consulted by the client as part of developing the CAP and agreement has been secured in respect of necessary scientific and other inputs (evidence is included in Appendix 1.3).
2.2.1	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.
2.2.2	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.
2.2.3	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
2.3.1	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.
2.3.2	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.
2.3.3	Yes	Yes	No	As in PI 213, there is analysis required here to assess the effectiveness of the strategy and to determine the outcome of ETP species. I didn't see any evidence to support that the client consulted with a research agency as required by CR 27.11.3. Milestones should include any re-scoring as a result of meeting the milestone. (CR 27.11.1.4c)	FCI Response: the Peer Reviewer comments are noted. Milestones are included and rescoring timelines are now indicated. The PI being scored is 2.3.3 - scoring issue A was found not to meet with the 80 level PISG 'Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species'. The requirement is that information be available in relation to evaluating impacts on ETP species. The condition is worded to require that understanding of levels of interaction be improved. It is not for the team to specify who must undertake what task in setting a condition, but merely to identify the shortcoming and the annual milestones that are required to be achieved in meeting with the 80 level PISG. By way of response to the condition, the client has proposed that improved data be collected through an onboard observer programme and that such data be analysed with assistance from a scientific organisation. This response is given in the CAP. This is considered to be an appropriate response and both the response and the text of the condition are in keeping with rules for condition setting. Relevant research agencies have been consulted by the client as part of developing the CAP and agreement has been secured in respect of necessary scientific and other inputs (evidence is included in Appendix 1.3).

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
2.4.1	Yes	No		The scoring justification quotes the SG80 level and awards 100 points. If there is no evidence as required by SG100, the fishery should score 80.	FCI Response: the quoted text is common to both 80 and 100 levels. However the justification text has been amended to remove the potential for misinterpretation.
2.4.2	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.
2.4.3	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.
2.5.1	Yes	No		The scoring justification supports the score of 80 but I don't see any evidence noted in the justification as required to meet any part of the SG100 scoring issue, and yet the score is 90.	FCI Response: the PISG is common to both 80 and 100 scores, the 100 level only differing from the 80 in that there is evidence that the fishery 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. Evidence is implicit in the justification text provided, however by way of response, evidence is now explicitly detailed in the justification text.
2.5.2	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.
2.5.3	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.
3.1.1	Yes	Yes			FCI Response: the Peer Reviewer comments are noted.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
3.1.2	Yes	No		The scoring justification seems to suggest that the consultation process is not sufficient at the national level to meet SG80c. In order to meet SG80c there should be clear evidence that the Seychelles Fisheries Authority provides the opportunity for stakeholders to have input into decisions. The background information provides no such information. Without it, score would be 75 with a condition applied.	FCI Response: To the justification text for 3.1.2.(C), the following has been added: "Stakeholder consultations are held on a regular basis regarding the development of the sector. The SFA works in close collaboration with Ministry Natural Resources, Ministry of Environment and Energy, Seychelles Coast Guard, Seychelles Ports Authority, other Government institutions, fishermen and boat owners associations, NGO's as well as overseas partners". As evidence of this see: **http://www.sfa.sc/aboutus.jsp#ouractivities** The justification now fully supports SG80 PISG's.
3.1.3	Yes	No		I would agree that the SG80 scoring issues are met at the regional and national level but SG100 scoring issue requires explicit reference to precautionary approach and I don't see that here. References to IOTC Resolutions would support SG80 but not SG100. Score should be 80.	FCI Response: Management of tuna fisheries is implemented by IOTC in regional context. There are explicit reference to precautionary approach in IOTC (2001) RESOLUTION 12/01 and the implementation of this with subsequent resolutions. The precautionary approach required by IOTC includes the adoption of interim target and limit reference points and IOTC Recommendations 13/10 and 12/14 on interim target and limit reference points. These measures establish clear and explicit requirements though being considered "interim" can be understood as "partially required". There is clear evidence to apply precautionary approach and ecosystem based management in IOTC resolutions

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
					including by catch reduction program or monitoring of ecosystem indicators. There is no reasonable justification to support the Peer Reviewer comment that "References to IOTC Resolutions would support SG80 but not SG100". Resolutions are the main mechanism by which IOTC implements management initiatives and which IOTC uses to drive change amongst CPC's. By not considering resolutions, a whole raft of RFMO management initiatives would not be eligible for consideration in scoring this or other PI's at SG100. This does not make sense and appears to suggest that resolutions are ineffective. There is abundant evidence that this is not the case and that resolutions are key instigators of changed and improved management within IOTC area.
3.1.4	No	No		There is no evidence provided to support the SG80 being met. The fact that the IOTC Compliance Committee has not implemented Res 10/09 is a key point here. There may be some evidence in IOTC's approach to encouraging non-members to join that might support this SG. Without that I would suggest a score of 75 with a	FCI Response: We believe that indeed IOTC Resolution 10.09 is pending deployment. Reviewing the IOTC-2014-1D S18-07 Rev - Performance Review update, believes that "There Remains a need to setup a scheme of incentives and penalties." We therefore accept the Peer Review comment in this context and consider it appropriate to amend the scoring to 75 on the basis that the single scoring issue is not fully met with at SG80. Accordingly it is necessary to implement a further condition, which will reflect the fact that the system of incentives must still be implemented by the IOTC.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
				condition.	
3.2.1	Yes	Yes	No	Milestones should include any re-scoring as a result of meeting the milestone. (CR 27.11.1.4c)	FCI Response: Milestones have been reviewed and consequential rescoring indicated where this may occur once milestones have been met with.
3.2.2	Yes	No		No justification is provided for why SG100b is not met. No justification is provided for SG100d being met. Particularly providing comprehensive information on management actions describing how the management system responded to the findings. Please provide evidence.	FCI Response: We consider the consultation processes in Seychelles are not sufficiently developed and implemented. Therefore, the SG 100b is not met. For SG100d, The IOTC has the appropriate consultation mechanisms that involve all stakeholders and dissemination and results and reports. Through meetings, workshops, work parties and other events, scientific information and management schemes are developed with the participation of all parties. The information is properly disseminated to all stakeholders and can also be viewed and downloaded from the website of the Commission. http://www.iotc.org/. The justification text for 3.2.2 d has been expanded and now supports better the awarding of the PISG at SG100 for scoring issue D. The different meetings and its results can be viewed on the website of meetings of the IOTC at http://www.iotc.org/meetings

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
3.2.3	Yes	No		There are no statements supporting the conclusion that none of the SG100 scoring issues are met.	FCI Response: SFA has a section focused to MCS with two sub-units: The Monitoring and Control Unit and the Enforcement Unit. The Monitoring and Control Unit is composed of the Fisheries Monitoring Centre (FMC) and the Fisheries Control Unit. FMC deals with the compliance of all fishing vessel's reporting requirements, Vessel Monitoring System (VMS), validation of statistical documents for ICCAT, IOTC, EU and Non-EU catch certificates. The Fisheries Control Unit is responsible for the processing of fishing licences. The Enforcement Unit carries out all inspectorate duties with regards to port state inspection, land inspection, sea and air surveillance duties pertaining to national and regional requirements. SFA has an observer program for the vessels with national flag and foreign that fishing in its waters. This SG issues met at SG80 but not SG100 because there is not a comprehensive MCS system implemented in the region by IOTC.
3.2.5	Yes	No		There is no evidence provided to support the occasional external review requirement of SG80b. Without that, the SG is not met and the score for the PI	FCI Response: Last update on progress regarding IOTC resolution 09/01 – on the performance review follow-up, indicates that External experts (Invited Experts) are regularly invited to provide additional expertise at Working Party meetings, although this does not constitute a formal process of peer review. Additional supporting text has been provided

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
				should be 70 with a condition.	in the justification for scoring issue b. In response to calls from the international community for a review of the performance of Regional Fisheries Management Organisations (RFMOs), the Indian Ocean Tuna Commission (IOTC) agreed in 2007 to implement a process of Performance Review. The IOTC formed a Review Panel, consisting of an independent legal expert, an independent scientific expert, six IOTC Members and a non-governmental organisations observer, which concluded its report to the Commission in January 2009. The Panel's review was based on the criteria developed as a result of a joint meeting of tuna RFMOs, Kobe, Japan, 2007. The report of the performance review is available **here.** A further performance review was initiated during 2014. Appropriate text has been included under the justification for scoring issue B which demonstrates that the SG80 is met. For this It is considered that SG80 is reached for this PI but not SG100

Any Other Comments

Comments	Certification Body Response

I am very concerned about the lack of traceability in this fishery since it is suggested the there is mixing of unit of certification tuna fished by setting on free schools, which accounts for 20% of the catch, with tuna that is caught by fishing around FAD's, which is not part of the unit of certification but makes up 80% of the catch. The fish are mixed on board. The report has highlighted this problem in Section 5.2.6 but the report fails to suggest how traceability the issue will be addressed in the fishery. At the very least the assessment team should comment in recommendations 6.3.2 that this must be resolved.	**FCI Response:** the team have identified and acknowledged the traceability issue in section 5. The matter has been considered fully and described explicitly. However, as stated previously, it is not for the team to detail how the client will address or resolve this issue. Neither is it for the team to recommend that any particular action be taken by the client organisation to resolve the traceability issue. It is entirely for the client organisation to address and resolve the issue and the assessment team have no role whatsoever in detailing how this issue is to be handled or resolved by the client. The function of a Recommendation is to detail where improvements can be made in respect of the performance of the fishery on any particular issue, but which will not prevent the certification or ultimate labelling of product as MSC certified. Clearly in this instance, the traceability issue will prevent the labelling of product. This h**as been clearly stated in the report.** The client will need to respond to the traceability requirement prior to any fish being eligible for labelling with the MSC ecolabel. This issue is fundamental (as repeatedly pointed out in Section 5) and goes well beyond simply making a Recommendation concerning improvements to traceability. Free school caught tuna will not be eligible to enter MSC chains of custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels.

For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response:
2.1.1	Yes	Yes	I have not completed the RBF training module although I am familiar with the process and requirements.	**FCI Response:** the Peer Reviewer comments are noted.

Peer Reviewer 2

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**~~Yes~~/No**	**Certification Body Response**
Justification: A number of issues that do, or could, affect the scoring of individual PIs have been identified. Whether these collectively affect the overall outcome of the assessment is unclear to the reviewer and depends on the presentation of additional evidence and the magnitude of any subsequent changes to PI scores.		**FCI Response:** the PR comments are noted. Each specific comment has been fully considered and responded to. Additional evidence has been provided where PR comments indicated scores were not supported. In one case, scores for a PI have been revised downwards on foot of OPR commentary. No change in overall outcome of the assessment of any UoC has resulted, although a new condition has been implemented

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	**~~Yes~~/No**	**Certification Body Response**
Justification: As currently presented some of the Conditions need strengthening. However, if additional evidence is provided, some or all of these Conditions may still be appropriate. New Conditions will be required for some PIs is additional evidence cannot be provided.		**FCI Response:** the PR comments are noted. Additional evidence has been provided where this has been warranted and conditions have been strengthened where necessary. All conditions remain in place and a new condition has been raised (condition 10 in relation to PI 3.1.4).

If included:

Do you think the client action plan is sufficient to close the conditions raised?	**~~Yes~~/No**	**Certification Body Response**
Justification: This depends on the outcome of providing more evidence for PIs. It is likely that the Client Action Plan (CAP) will need to be adjusted to address the final outcome of any changes to existing Conditions, rescoring and any new Conditions. Most of the CAP response to the conditions are rather light on exactly how progress will be made with respect to at least some milestones. Statements are made about what will be achieved but not how. Some more specific descriptions about how the milestones will be achieved would be more appropriate. For example, in Condition 2, for year 2 it states that 'The company will help to determine an appropriate HCR with a proper evaluation of harvest control in collaboration with the scientific institutes': what is needed is a description of what the company will actually do to contribute to and ensure that this milestone is achieved. For the PI 1.1.2. Conditions (1, 3 and 5) there is lead in text about the level of observer coverage. This text is not relevant to these conditions but is relevant to Conditions 7 and 8.		**FCI Response:** the CAP has been revised and strengthened by the client in light of PR comments, changes to scoring and conditions as well as the setting of a new condition in relation to 3.1.4. The revised CAP details more precisely what actions the client will undertake in order to meet with the annual milestones. Milestones have been clearly identified where appropriate and rescoring timelines indicated clearly.

General Comments on the Assessment Report (optional)

Some of the supportive evidence provided for P1 comprises intentional actions i.e. the direction has been clearly signalled by the RFMO through, for example, the tasking of the Scientific Committee. However, where these have not been seen through to actual actions or adopted by the RFMO, I have rejected these as evidence that something is 'in place' which is my understanding of the requirement of the MSC assessment process i.e. to consider the current fishery, not one that has occurred in the past or will (or may do) in the future.

The report also cites RFMO resolutions requiring certain actions as evidence that information is available (e.g. in section 1.2.3 for all stocks). While such resolutions can be used as evidence in P3, and they may indicate appropriate intentions for P1 and P2, they are not sufficient as evidence of data quality or availability for P1 or P2.

Overall, there is too little information about observer coverage, which is critical for evaluating the fish and ETP bycatch PIs. There is whole list of questions that remain unanswered: what is the average coverage (trips, sets per year); given the relatively low level of coverage, what is the spatial aspect of coverage, are the same areas covered in all years or are different areas covered in different years.

The national (flag state) management of distant water vessels fishing within UN RFMO arrangements is an important element that determines what fleets can or cannot do within a fisheries context. In these fisheries, the EU and the European Commission (EC) play significant roles in regulating the fisheries, both directly and through participation in the IOTC. The roles that the EU and EC play in the management of these fisheries has been substantially understated with the text addressing P3 in the scoring tables.

FCI Response:

i) PR2 comments in relation to P1

In relation to key aspects there is evidence of 'tasking', action and reporting. For example:

- IOTC resolutions on the limitation of fishing effort are fully described in (new) section 3.3.4.2 Included is a description of the key findings on a report presented in 2014, on the implementation of a limitation of fishing capacity of contracting parties and cooperating non-contracting parties. (IOTC-2014-CoC11-05 Rev1[E]. prepared by IOTC Secretariat, 26 April, 2014). Again there is clear evidence of 'intentional actions' i.e. the direction has been clearly signalled by the IOTC; actual actions by IOTC; and reporting on the outcome of these actions.
- IOTC resolution 12/13 for the conservation and management of tropical tunas stocks in the IOTC area of competence are fully described in (new) section 3.3.4.3 Included here is a description of the key findings on a report presented in 2011, A preliminary investigation into the effects of Indian Ocean MPAs on yellowfin tuna, Thunnus albacares, with particular emphasis on the IOTC closed area. Once again there is clear evidence of 'intentional actions' i.e. the direction has been clearly signalled by the IOTC; actual actions; and reporting on the outcome of these actions.
- In relation to collection of data from all key fisheries, IOTC resolution 13/03 "on the recording of catch and effort data by fishing vessels in the IOTC area of competence" sets out a comprehensive catch and effort data collection and reporting structure. Thereafter individual working group reports provide the results of this data reporting system and discuss the quality of data, missing data etc. Once again there is clear evidence of 'intentional actions' i.e. the direction has been clearly signalled by the IOTC; actual actions; and reporting on the outcome of these actions; the latter are found in working group reports: IOTC-2013-SC16-R[E]. Executive Summary, Appendix IX, Bigeye Tuna; Appendix X, Skipjack Tuna; and Appendix XI, Yellowfin Tuna.
- In relation to error reporting, IOTC has also made specific recommendations (see IOTC recommendation 14/07 to standardise the presentation of scientific information in the annual scientific committee report and in working party reports"). Once again there is clear evidence of 'intentional actions' i.e. the direction has been clearly signalled by the IOTC; actual actions; and reporting on the outcome of these actions; the latter are found in working group reports: IOTC-2013-SC16-R[E]. Executive Summary, Appendix IX, Bigeye Tuna; Appendix X, Skipjack Tuna; and Appendix XI, Yellowfin Tuna.

ii) PR2 comments in relation to P2

Additional text has been provided in relation to observer coverage in Section 3. This provides more information and detail with respect to temporal and spatial area of observer coverage as well as other details in relation to the operation of the observer schemes.

iii) PR2 comments in relation to P3

The national (flag state) management of distant water vessels fishing within UN RFMO arrangements is an important element that determines what fleets can or cannot do within a fisheries context. In these fisheries, the EU and the European Commission (EC) play significant roles in regulating the fisheries, both directly and through participation in the IOTC. The roles that the EU and EC play in the management of these fisheries has been substantially understated with the text addressing P3 in the scoring tables, this has been amended in the PCDR by the addition of further justification text.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
1.1.1	YFT: Yes SKJ: Yes BET: Yes	YFT: Yes SKJ: Yes BET: Yes	YFT: NA SKJ: NA BET: NA	YFT: Correctly scored & evidenced. SKJ: The Kobe plot (Figure 3.3.3) showing the stock trajectory is too small to be able to discern in which years overfishing was occurring, and is important for assessing where the stock has been in relation to it reference points. BET: The Kobe plot (Figure 3.3.8) showing the stock trajectory is too small and of too poor a quality to be able to discern which year is which, and is important for assessing where the stock has been in relation to it reference points.	FCI Response: comments noted.
1.1.2	YFT: No	YFT: No	YFT: No	YFT: In relation to the target and the 80 and 100 scoring guideposts, the report does not comment on either of the two points that follow. (i) The target is set at MSY which allows no precaution in management for errors in the estimation of the stock, and (ii) the estimation of MSY itself will have been subject to error and requires some precautionary element in management to address this (see the somewhat different approach for BET). Given point (ii) and on the evidence provided, it is arguable that SG 80c has not been met because of the individual	FCI Response: Issues of uncertainty are now specifically considered in section 3.3.4.4) particularly in respect of errors in the estimation of the stock status, and (ii) the estimation of MSY itself. This section considers uncertainty, the use of Btrigger, and IOTC resolution 14/07 which seeks to standardise the presentation of scientific information (and uncertainty) in the annual scientific committee report as well as working party reports. Specifically it notes that for a number of tuna RFMOs (including IOTC) Bmsy is, by convention, set as a target. This is not however incompatible with the SG80 requirement that the target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome *provided that* uncertainty is addressed and incorporated into the advice and (ii) is acted on

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
	SKJ: No	SKJ: No	SKJ: No	and combined risks of the estimate of MSY being too high and stock status also being overestimated. If these arguments on additional uncertainty are accepted, the wording of the Condition (#1) will need to be updated to address the causes of these uncertainties. SKJ: In relation to the target and the 80 and 100 scoring guideposts, the report does not comment on either of the two points that follow. (i) The target is set at MSY which allows no precaution in management for errors in the estimation of the stock, and (ii) the estimation of MSY itself will have been subject to error and requires some precautionary element in management to address this (see the somewhat different approach for BET). Given point (ii) and on the evidence provided, it is arguable that SG 80c has not been met because of the individual and combined risks of the estimate of MSY being too high and stock status also being overestimated. There is also additional uncertainty described in the main text (section 3.3.1.3) in relation to problems with the FMSY estimation which is	accordingly. This is the case for this stock. Conversely it is NOT compatible with the SG100 which requires that the target reference point is such that the stock is, not alone, maintained at a level consistent with BMSY (or some measure or surrogate with similar intent or outcome, or a higher level) but also takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty. – Issues of uncertainty are now specifically considered in section 3.3.4.4) particularly in respect of errors in the estimation of the stock status, and (ii) the estimation of MSY itself. This section considers uncertainty, the use of Btrigger, and IOTC resolution 14/07 which seeks to standardise the presentation of scientific information (and uncertainty) in the annual scientific committee report as well as working party reports. Specifically it notes that for a number of tuna RFMOs (including IOTC) Bmsy is, by convention, set as a target. This is not however incompatible with the SG80 requirement that the target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome *provided that* uncertainty is addressed and incorporated into the advice and (ii) is acted on accordingly. This is the case for this stock. Conversely it is NOT compatible with the SG100 which requires that the target reference point is such that the stock is, not alone, maintained at a level consistent with BMSY (or some measure or

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	BET: No	BET: No	BET: No	not referred to in the scoring justification. If these arguments on additional uncertainty are accepted, the wording of the Condition (#3) will need to be updated to address the causes of these uncertainties. BET: In relation to the target and the 80 and 100 scoring guideposts, the report does not comment on either of the two points that follow. (i) The target is set at MSY which allows no precaution in management for errors in the estimation of the stock, and (ii) the estimation of MSY itself will have been subject to error and requires some precautionary element in management to address this (see the somewhat different approach for BET). Given point (ii) and on the evidence provided, it is arguable that SG 80c has not been met because of the individual and combined risks of the estimate of MSY being too high and stock status also being overestimated. If these arguments on additional uncertainty are accepted the wording of the Condition (#5) will need to be updated to address the causes of these uncertainties.	surrogate with similar intent or outcome, or a higher level) but also takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty. – Issues of uncertainty are now specifically considered in section 3.3.4.4) particularly in respect of errors in the estimation of the stock status, and (ii) the estimation of MSY itself. This section considers uncertainty, the use of Btrigger, and IOTC resolution 14/07 which seeks to standardise the presentation of scientific information (and uncertainty) in the annual scientific committee report as well as working party reports. Specifically it notes that for a number of tuna RFMOs (including IOTC) Bmsy is, by convention, set as a target. This is not however incompatible with the SG80 requirement that the target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome *provided that* uncertainty is addressed and incorporated into the advice and (ii) is acted on accordingly. This is the case for this stock. Conversely it is NOT compatible with the SG100 which requires that the target reference point is such that the stock is, not alone, maintained at a level consistent with BMSY (or some measure or surrogate with similar intent or outcome, or a higher level) but also takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty. -

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1.1.3	All UoC: Yes	All UoC: Yes	All UoC: NA	All UoC: Correctly scored & evidenced.	FCI Response: comments noted
1.2.1	YFT: No SKJ: No	YFT: No SKJ: No	YFT: NA SKJ: NA	YFT: The statement in SG 80b that 'the stock is overfished' appears to be an error. The definition of the HS includes only one element of control (sections 3.3.2.5 & 3.3.2.6) which is effort limitation. The effectiveness of effort limitation depends precisely upon how it is implemented, thus the assumption that this approach will be effective is flawed and does really support achievement of SG80b although this may be better dealt with under PI 1.1.2 below. There is some evidence that the HS is achieving its objectives, as seen in the improvement in F in the Kobe plot from 2004-06 (Figure 3.3.5). SKJ: The statement in SG 80b that 'the stock is overfished' appears to be an error. The definition of the HS includes only one element of control (sections 3.3.1.5 & 3.3.1.6) which is effort limitation. The effectiveness of effort limitation depends precisely upon how it is implemented, thus the assumption that	FCI Response: CORRECTED Control elements are now consider more fully in sections 3.3.4.2 and 3.3.4.3. IOTC RES 12/13 explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ. The resolution also includes specification for testing the effectiveness of the measure, regarded as a pilot. That testing was carried out in a timely fashion by independent analysts (IOTC-2011-SC14-40) which found the limited, pilot measures insufficient to control exploitation but noted how extended measures could help to control exploitation, not so much by controlling catch volume but through improvements to the exploitation pattern (i.e. by reducing the selectivity of juvenile Yellowfin). Consideration of the spatial/temporal measures is also included in IOTC-2012-WPTT14-R[E]. It should be noted in this context that GCB 2.6.4 makes clear that control of exploitation rates need not be restricted to the use of HCR that respond directly to population size but might also, e.g., involve reducing exploitation rate on parts of the stock (as in the case of RES 12/13). Overall, the IOTC has demonstrated the ability via resolution to use spatial/temporal closures and intent to understand how these can be effective at controlling exploitation. This constitutes some

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	BET: No	BET: No	BET: NA	this approach will be effective is flawed and does really support achievement of SG80b although this may be better dealt with under PI 1.1.2 below. There is some evidence that the HS is achieving its objectives, as seen in the improvement in stock status and F in the Kobe plot (Figure 3.3.3). BET: The statement in SG 80b that 'the stock is overfished' appears to be an error. The definition of the HS includes only one element of control (sections 3.3.3.5 & 3.3.3.6) which is effort limitation. The effectiveness of effort limitation depends precisely upon how it is implemented, thus the assumption that this approach will be effective is flawed and does really support achievement of SG80b although this may be better dealt with under PI 1.1.2 below.	evidence of use of an appropriate tool to control exploitation and to understand the efficacy of the tool. The IOTC has a long history of resolutions aimed at limiting effort/capacity. These include IOTC RES01/04, 03/01, 06/05, 09/02, and 12/11. Early resolutions were aimed at non-members but were soon extended to all Contracting Parties and Cooperating non-members (CPC). The most recent resolution, IOTC RES12/11, is aimed at determining fishing capacity for all IOTC CPC, to ensure stabilisation of the level of fishing capacity active on stocks of high commercial value (including yellowfin tuna). The resolution provides for planned fleet development and vessel replacement but is aimed at ensuring no effective increase in capacity from a 2006 baseline plus any agreed Fishery Development Plans (FDP) for the years 2007-2013. In addition, the IOTC has an ongoing process to develop a catch allocation scheme and has already developed allocation principles. IOTC RES 13/10 and the MSE research planning and contracting, and IOTC MSE workshop reports (C2_WK_MSE_REPORT), together with work on allocation (IOTC-2011-SS4-PropA[E], IOTC-2011-SS4-PropB[E], IOTC-2013-TCAC02-R[E]) clearly demonstrates the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction, though as of Nov 2013 these have not yet been used. On the basis of the foregoing there is clearly some evidence that tools used to implement harvest control rules have been introduced

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					by the IOTC, that they are appropriate and that they have been effective in controlling exploitation.
1.2.2	YFT: Yes	YFT: No	YFT: No	YFT: The lack of a defined HCR is critical. The report (sections 3.3.2.5 & 3.3.2.6) do not provide adequate evidence that tools exist that would 'act to reduce the exploitation rate limit reference points are approached' which is required to meet SG 60a. The justification text notes area closures and TACs as being available but with no further detail. There is evidence that IOTC are considering such tools, as indicted in the referenced papers, but these do not appear to be in place currently based on the evidence provided and given the nature of such allocation discussions, may take some time to agree and be implemented. Either more evidence needs to be provided to support the score given or this PI needs to be rescored. The definition of the HS includes only one element of control (sections 3.3.2.5 & 3.3.2.6) which is effort limitation. The effectiveness of effort limitation depends precisely upon how it is implemented, thus the assumption that this approach will be effective is flawed. The Condition (#2) should also require	FCI R FCI Response: See section 3.3.4.2 (new) IOTC RES 12/13 explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ. The resolution also includes specification for testing the effectiveness of the measure, regarded as a pilot. That testing was carried out in a timely fashion by independent analysts (IOTC-2011-SC14-40) which found the limited, pilot measures insufficient to control exploitation but noted how extended measures could help to control exploitation, not so much by controlling catch volume but through improvements to the exploitation pattern (i.e. by reducing the selectivity of juvenile Yellowfin). Consideration of the spatial/temporal measures is also included in IOTC-2012-WPTT14-R[E]. It should be noted in this context that GCB 2.6.4 makes clear that control of exploitation rates need not be restricted to the use of HCR that respond directly to population size but might also, e.g., involve reducing exploitation rate on parts of the stock (as in the case of RES 12/13). Overall, the IOTC has demonstrated the ability via resolution to use spatial/temporal closures and intent to understand how these can be effective at controlling exploitation. This constitutes some

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	SKJ: Yes	SKJ: No	SKJ: No	appropriate tools to be implemented. SKJ: The lack of a defined HCR is critical. The report (sections 3.3.1.5 & 3.3.1.6) do not provide adequate evidence that tools exist that would 'act to reduce the exploitation rate limit reference points are approached' which is required to meet SG 60a. The justification text notes area closures and TACs as being available but with no further detail. There is evidence that IOTC are considering such tools, as indicted in the referenced papers, but these do not appear to be in place currently based on the evidence provided and given the nature of such allocation discussions, may take some time to agree and be implemented. Either more evidence needs to be provided to support the score given or this PI needs to be rescored. The definition of the HS includes only one element of control (sections 3.3.1.5 & 3.3.1.6) which is effort limitation. The effectiveness of effort limitation depends precisely upon how it is implemented, thus the assumption that this approach will be effective is flawed. The Condition (#4) should also require appropriate tools to be implemented.	evidence of use of an appropriate tool to control exploitation and to understand the efficacy of the tool. The IOTC has a long history of resolutions aimed at limiting effort/capacity. These include IOTC RES01/04, 03/01, 06/05, 09/02, and 12/11. Early resolutions were aimed at non-members but were soon extended to all Contracting Parties and Cooperating non-members (CPC). The most recent resolution, IOTC RES12/11, is aimed at determining fishing capacity for all IOTC CPC, to ensure stabilisation of the level of fishing capacity active on stocks of high commercial value (including yellowfin tuna). The resolution provides for planned fleet development and vessel replacement but is aimed at ensuring no effective increase in capacity from a 2006 baseline plus any agreed Fishery Development Plans (FDP) for the years 2007-2013. In addition, the IOTC has an ongoing process to develop a catch allocation scheme and has already developed allocation principles. IOTC RES 13/10 and the MSE research planning and contracting, and IOTC MSE workshop reports (C2_WK_MSE_REPORT), together with work on allocation (IOTC-2011-SS4-PropA[E], IOTC-2011-SS4-PropB[E], IOTC-2013-TCAC02-R[E]) clearly demonstrates the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction, though as of Nov 2013 these have not yet been used. On the basis of the foregoing there is clearly some evidence that tools used to implement harvest control rules have been introduced

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	BET: Yes	BET: No	BET: No	BET: The lack of a defined HCR is critical. The report (sections 3.3.3.5 & 3.3.3.6) do not provide adequate evidence that tools exist that would 'act to reduce the exploitation rate limit reference points are approached' which is required to meet SG 60a. The justification text notes area closures and TACs as being available but with no further detail. There is evidence that IOTC are considering such tools, as indicted in the referenced papers, but these do not appear to be in place currently based on the evidence provided and given the nature of such allocation discussions, may take some time to agree and be implemented. Either more evidence needs to be provided to support the score given or this PI needs to be rescored. The definition of the HS includes only one element of control (sections 3.3.3.5 & 3.3.3.6) which is effort limitation. The effectiveness of effort limitation depends precisely upon how it is implemented, thus the assumption that this approach will be effective is flawed. The Condition (#6) should also require appropriate tools to be implemented.	by the IOTC, that they are appropriate and that they have been effective in controlling exploitation. IOTC RES 12/13 explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ. The resolution also includes specification for testing the effectiveness of the measure, regarded as a pilot. That testing was carried out in a timely fashion by independent analysts (IOTC-2011-SC14-40) which found the limited, pilot measures insufficient to control exploitation but noted how extended measures could help to control exploitation, not so much by controlling catch volume but through improvements to the exploitation pattern (i.e. by reducing the selectivity of juvenile Yellowfin). Consideration of the spatial/temporal measures is also included in IOTC-2012-WPTT14-R[E]. It should be noted in this context that GCB 2.6.4 makes clear that control of exploitation rates need not be restricted to the use of HCR that respond directly to population size but might also, e.g., involve reducing exploitation rate on parts of the stock (as in the case of RES 12/13). Overall, the IOTC has demonstrated the ability via resolution to use spatial/temporal closures and intent to understand how these can be effective at controlling exploitation. This constitutes some evidence of use of an appropriate tool to control exploitation and to understand the efficacy of the tool. The IOTC has a long history of resolutions aimed at limiting effort/capacity. These include IOTC RES01/04, 03/01, 06/05, 09/02, and 12/11. Early resolutions were aimed at non-members but were

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					soon extended to all Contracting Parties and Cooperating non-members (CPC). The most recent resolution, IOTC RES12/11, is aimed at determining fishing capacity for all IOTC CPC, to ensure stabilisation of the level of fishing capacity active on stocks of high commercial value (including yellowfin tuna). The resolution provides for planned fleet development and vessel replacement but is aimed at ensuring no effective increase in capacity from a 2006 baseline plus any agreed Fishery Development Plans (FDP) for the years 2007-2013. In addition, the IOTC has an ongoing process to develop a catch allocation scheme and has already developed allocation principles. IOTC RES 13/10 and the MSE research planning and contracting, and IOTC MSE workshop reports (C2_WK_MSE_REPORT), together with work on allocation (IOTC-2011-SS4-PropA[E], IOTC-2011-SS4-PropB[E], IOTC-2013-TCAC02-R[E]) clearly demonstrates the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction, though as of Nov 2013 these have not yet been used. On the basis of the foregoing there is clearly some evidence that tools used to implement harvest control rules have been introduced by the IOTC, that they are appropriate and that they have been effective in controlling exploitation. IOTC RES 12/13 explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ. The resolution also includes specification for testing the effectiveness of the measure, regarded

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					as a pilot. That testing was carried out in a timely fashion by independent analysts which found the limited, pilot measures insufficient to control exploitation but noted how extended measures could help to control exploitation, not so much by controlling catch volume but through improvements to the exploitation pattern (i.e. by reducing the selectivity of juvenile Yellowfin). Consideration of the spatial/temporal measures is also included in IOTC-2012-WPTT14-R[E]. It should be noted in this context that GCB 2.6.4 makes clear that control of exploitation rates need not be restricted to the use of HCR that respond directly to population size but might also, e.g., involve reducing exploitation rate on parts of the stock (as in the case of RES 12/13). Overall, the IOTC has demonstrated the ability via resolution to use spatial/temporal closures and intent to understand how these can be effective at controlling exploitation. This constitutes some evidence of use of an appropriate tool to control exploitation and to understand the efficacy of the tool. The IOTC has a long history of resolutions aimed at limiting effort/capacity. These include IOTC RES01/04, 03/01, 06/05, 09/02, and 12/11. Early resolutions were aimed at non-members but were soon extended to all Contracting Parties and Cooperating non-members (CPC). The most recent resolution, IOTC RES12/11, is aimed at determining fishing capacity for all IOTC CPC, to ensure stabilisation of the level of fishing capacity active on stocks of high commercial value (including yellowfin tuna). The resolution provides for planned fleet development and vessel replacement but is aimed at ensuring no effective increase in capacity from a 2006 baseline

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					plus any agreed Fishery Development Plans (FDP) for the years 2007-2013. In addition, the IOTC has an ongoing process to develop a catch allocation scheme and has already developed allocation principles. IOTC RES 13/10 and the MSE research planning and contracting, and IOTC MSE workshop reports (C2_WK_MSE_REPORT), together with work on allocation (IOTC-2011-SS4-PropA[E], IOTC-2011-SS4-PropB[E], IOTC-2013-TCAC02-R[E]) clearly demonstrates the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction, though as of Nov 2013 these have not yet been used. On the basis of the foregoing there is clearly some evidence that tools used to implement harvest control rules have been introduced by the IOTC, that they are appropriate and that they have been effective in controlling exploitation. **FCI Response:** CORRECTED Control elements are now consider more fully in sections 3.3.4.2 and 3.3.4.3. IOTC RES 12/13 explicitly links the need to limit tropical tuna catches to estimated MSY levels by implementing spatial/temporal controls on fishing by all vessels over 24m and vessels under 24m fishing outside of their own EEZ. The resolution also includes specification for testing the effectiveness of the measure, regarded as a pilot. That testing was carried out in a timely fashion by

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					independent analysts (IOTC-2011-SC14-40) which found the limited, pilot measures insufficient to control exploitation but noted how extended measures could help to control exploitation, not so much by controlling catch volume but through improvements to the exploitation pattern (i.e. by reducing the selectivity of juvenile Yellowfin). Consideration of the spatial/temporal measures is also included in IOTC-2012-WPTT14-R[E]. It should be noted in this context that GCB 2.6.4 makes clear that control of exploitation rates need not be restricted to the use of HCR that respond directly to population size but might also, e.g., involve reducing exploitation rate on parts of the stock (as in the case of RES 12/13). Overall, the IOTC has demonstrated the ability via resolution to use spatial/temporal closures and intent to understand how these can be effective at controlling exploitation. This constitutes some evidence of use of an appropriate tool to control exploitation and to understand the efficacy of the tool. The IOTC has a long history of resolutions aimed at limiting effort/capacity. These include IOTC RES01/04, 03/01, 06/05, 09/02, and 12/11. Early resolutions were aimed at non-members but were soon extended to all Contracting Parties and Cooperating non-members (CPC). The most recent resolution, IOTC RES12/11, is aimed at determining fishing capacity for all IOTC CPC, to ensure stabilisation of the level of fishing capacity active on stocks of high commercial value (including yellowfin tuna). The resolution provides for planned fleet development and vessel replacement but is aimed at ensuring no effective increase in capacity from a 2006 baseline

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					plus any agreed Fishery Development Plans (FDP) for the years 2007-2013. In addition, the IOTC has an ongoing process to develop a catch allocation scheme and has already developed allocation principles. IOTC RES 13/10 and the MSE research planning and contracting, and IOTC MSE workshop reports (C2_WK_MSE_REPORT), together with work on allocation (IOTC-2011-SS4-PropA[E], IOTC-2011-SS4-PropB[E], IOTC-2013-TCAC02-R[E]) clearly demonstrates the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction, though as of Nov 2013 these have not yet been used. On the basis of the foregoing there is clearly some evidence that tools used to implement harvest control rules have been introduced by the IOTC, that they are appropriate and that they have been effective in controlling exploitation.
1.2.3	YFT: No	YFT: No	YFT: No	YFT: The main text states that 20-30% of YFT catches are made by artisanal vessels and that there are uncertainties in catch reporting for a number of artisanal as well as industrial fleets. This does not match the statement of comprehensive YFT catch reporting in the scoring table for PI 1.2.3a. Given the uncertainties in catches made by a number of artisanal and industrial fleets, the text and score given for PI 1.1.3.c need more	**FCI Response:** CB 2.7.1 requires the identification of which information from the information categories in CB2.7.1.1 is relevant to the design and effective operational phases of the harvest strategy, Harvest Control Rules and tools, and that evaluation should be based on this information. In terms of the harvest strategy and its component parts, the most important data are fishery removals as inputs to the stock assessment used to determine stock status relative to MSY-related reference points. GCB 2.7.2 clarifies that the reference to 'other' fishery removals in scoring issue c relates to vessels outside or not covered by the unit of certification.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
	SKJ: No	SKJ: No	SKJ: No	justification to evidence that 'There is good information on all other fishery removals from the stock.' Without more evidence, PI 1.2.3c would need to be rescored and a new Condition raised. SKJ: The main text states (Section 3.3.1.1) that catch and effort data are not available, or are considered to be of poor quality from a number of important fisheries, which are identified. This does not match the statement of comprehensive SKJ catch reporting in the scoring table for PI 1.2.3a. Given the uncertainties in catches made by a number of important fleets, the text and score given for PI 1.1.3.c need more justification to evidence that 'There is good information on all other fishery removals from the stock.' Without more evidence, PI 1.2.3c would need to be rescored and a new Condition raised. BET: The justification for their being 'good information on all other fishery removals from the stock.' is that there are regulatory requirements in place. The existence of regulatory requirements is no guarantee of the collection or availability of any data, good bad or indifferent. This PI therefore has no	These require good information but not necessarily to the same level of accuracy or coverage as that covered by the second scoring issue. In fact, as the harvest strategy works at Indian Ocean and IOTC level, not at the level of the unit of certification, "other removals" in this instance are effectively subsumed in to consideration of fishery removals at PI 1.2.3b and, consistent with that, it is clear that there is good information on all other fishery removals from the stock, consistent with SG80 scoring criteria. IOTC Resolution 13/03 requires that all purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres length overall and those under 24 metres if they fish outside the EEZs of their flag States within the IOTC area of competence to keep a bound paper or electronic logbook and to record, inter alia, the weight (kg) or number by species per set/shot/fishing event for each of a comprehensive list of species. For purse seine, this includes IOTC species, marine turtles, marine mammals, sharks, rays and other bony fish. It is apparent that IOTC has put considerable effort into the recording and reporting of catches and that the current level of reporting is adequate given the large number of small countries involved and the difficult task of monitoring small vessels often far away or on the high seas. Overall, data are sufficient to meet the SG80. FCI Response: CB 2.7.1 requires the identification of which information from the information categories in CB2.7.1.1 is relevant to the design and effective operational phases of the harvest

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	BET: No	BET: No	BET: No	evidence to support it. Either evidence supporting the quality and quantity of data on other fishery removals needs to be provided, or this PI should be rescored and a new Condition raised.	strategy, Harvest Control Rules and tools, and that evaluation should be based on this information. In terms of the harvest strategy and its component parts, the most important data are fishery removals as inputs to the stock assessment used to determine stock status relative to MSY-related reference points. GCB 2.7.2 clarifies that the reference to 'other' fishery removals in scoring issue c relates to vessels outside or not covered by the unit of certification. These require good information but not necessarily to the same level of accuracy or coverage as that covered by the second scoring issue. In fact, as the harvest strategy works at Indian Ocean and IOTC level, not at the level of the unit of certification, "other removals" in this instance are effectively subsumed in to consideration of fishery removals at PI 1.2.3b and, consistent with that, it is clear that there is good information on all other fishery removals from the stock, consistent with SG80 scoring criteria. IOTC Resolution 13/03 requires that all purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres length overall and those under 24 metres if they fish outside the EEZs of their flag States within the IOTC area of competence to keep a bound paper or electronic logbook and to record, inter alia, the weight (kg) or number by species per set/shot/fishing event for each of a comprehensive list of species. For purse seine, this includes IOTC species, marine turtles, marine mammals, sharks, rays and other bony fish. It is apparent that IOTC has put considerable effort into the recording and reporting of catches and that the current level of reporting is adequate given the large number of small countries involved and the difficult task of monitoring small vessels often far away or on the high

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					seas. Overall, data are sufficient to meet the SG80. FCI Response: CB 2.7.1 requires the identification of which information from the information categories in CB2.7.1.1 is relevant to the design and effective operational phases of the harvest strategy, Harvest Control Rules and tools, and that evaluation should be based on this information. In terms of the harvest strategy and its component parts, the most important data are fishery removals as inputs to the stock assessment used to determine stock status relative to MSY-related reference points. GCB 2.7.2 clarifies that the reference to 'other' fishery removals in scoring issue c relates to vessels outside or not covered by the unit of certification. These require good information but not necessarily to the same level of accuracy or coverage as that covered by the second scoring issue. In fact, as the harvest strategy works at Indian Ocean and IOTC level, not at the level of the unit of certification, "other removals" in this instance are effectively subsumed in to consideration of fishery removals at PI 1.2.3b and, consistent with that, it is clear that there is good information on all other fishery removals from the stock, consistent with SG80 scoring criteria. IOTC Resolution 13/03 requires that all purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres length overall and those under 24 metres if they fish outside the EEZs of their flag States within the IOTC area of competence to keep a bound paper or electronic logbook and to record, inter alia, the weight (kg) or number by species per set/shot/fishing event for each of a comprehensive list of species. For purse seine, this

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					includes IOTC species, marine turtles, marine mammals, sharks, rays and other bony fish. It is apparent that IOTC has put considerable effort into the recording and reporting of catches and that the current level of reporting is adequate given the large number of small countries involved and the difficult task of monitoring small vessels often far away or on the high seas. Overall, data are sufficient to meet the SG80.
1.2.4	YFT: No SKJ: No	YFT: No SKJ: No	YFT: NA SKJ: NA	YFT: The title ('There is an adequate assessment of the stock status.') is missing from the header row. While the assessment does evaluate a range of uncertainties, the reporting of uncertainty is not comprehensive, the Kobe plot and advice table is based on average values from a number of assessment runs which will mask the real level of uncertainty, especially for those runs that are very different from the average. It is, therefore, debatable whether this supports the achievement of SG100c, and if not, the overall score for PI 1.2.4 should be reviewed. SKJ: While the assessment does evaluate a range of uncertainties, the reporting of uncertainty is not comprehensive, the Kobe	FCI Response: missing text has been added. The assessment team found that the evidence supported scoring at 100 for issue C. The PR comment has been considered and the issue and scoring reviewed. The assessment team feel that scoring at 100 is appropriate and is adequately justified. No change to the scoring has been made in response to the comment.

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	BET: Yes	BET: Yes	BET: NA	plot and advice table is based on average values from a number of assessment runs which will mask the real level of uncertainty, especially for those runs that are very different from the average. It is, therefore, debatable whether this supports the achievement of SG100c, and if not, the overall score for PI 1.2.4 should be reviewed. BET: Correctly scored & evidenced.	
2.1.1	All UoC: No	All UoC: Yes	All UoC: NA	All UoC: A number of shark species were listed by CITES at CoP16 in 2013 and became subject to trade protection from 14th September 2014. This includes several genera and species evaluated as Retained species in these fisheries. All affected genera and species will need to be re-evaluated under the ETP PI. These include but may not be limited to, the oceanic white tip shark (Carcharhinus longimanus), the scalloped hammerhead shark (Sphyrna lewini), and manta rays of the genus Manta. Most of the detailed data on retained species is relatively old, dating from 2003-2008 and	**FCI Response:** the shark species referred to were all proposed for listing from September 14th 2014. This date is significantly after the site visit and scoring had taken place. Apart from this, the comment is incorrect in stating that "All affected genera and species will need to be re-evaluated under the ETP PI" as the listing under CITES being referred to by the PR is not consistent with CB3.11.1. While data on bycatch may be from an earlier period no evidence was presented to indicate why it may no longer be relevant for the freeschool fishery. The requirement for up to date information in order to monitor possible changes in risk is captured under scoring of 2.1.3 (retained species information PI). Double scoring is not appropriate and the issue of currency of data is dealt with under 2.1.3 and a condition has been set in relation to that PI accordingly.

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				may not be giving a valid picture of the current fishery or its impact on the outcome status of the retained species.	

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2.1.2	All UoC: Yes	All UoC: No	All UoC: No	All UoC: There are various measures in place that achieve the SG 60 for all Retained species. There is also a partial strategy in place that meets the SG 80 guidepost for the YFT, SKJ, BET, albacore and swordfish that are subject to directed fisheries. However, no evidence of a partial strategy aimed at the large number of other Retained species is provided. Unconnected measures to release fish (with moderate to high post-release mortality), VMS, area restrictions (aimed at tuna) and restrictions on shark finning do not meet the definition of partial strategy. Either considerably more evidence of such a partial strategy is required to sustain the current score or this PI should be rescored, would fall below the SG 80 and a new Condition would be required. In the justification for SG 2.1.2a it is reported that Echebastar operate on-board procedures intended to reduce unwanted bycatch. These procedures are not detailed and no reference document is included in the references.	FCI Response: the requirement of scoring 2.1.2 has been misinterpreted by the PR. Scoring at SG80 requires consideration of management strategy in relation to main retained species only, not ALL retained species. Main retained is a term defined in the CR. The main retained species in this fishery are identified for each UoC assessed. The PR notes that "There is also a partial strategy in place that meets the SG 80 guidepost for the YFT, SKJ, BET, albacore and swordfish that are subject to directed fisheries". Accordingly, the PR has confirmed that scoring at SG80 is consistent with the CR. The reference to onboard procedures has been clarified in the text to refer to catches of large unwanted species including sharks, turtles and other unwanted bycatch. The funding aid confirmed to Echebastar in October 2013 meant that research work would only commence after the fishery had been scored. No results were available at time of preparation of the PCDR. An update with respect to the findings can be provided at first annual surveillance. WRT to observer coverage in order to verify shark finning is not taking place, additional information has been provided in Section 3 of the report as well as scoring issue e for 2.1.2 to support the scoring of this PISG at

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				In SG 2.1.2a, reference is also made to a study planned for October 2013; given the date, some updated information on this project should be available for inclusion in this report. In relation to SG 2.1.2e, the MSC guidance indicates that ATs should interpret whether the level of observer coverage is sufficient to be capable of detecting whether shark fining is occurring. There is no adequate, quantitative information provided about the level of observer coverage.	

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2.1.3	All UoC: Yes	All UoC: No	All UoC: No	All UoC: Most of the detailed data on Retained species is relatively old, dating from 2003-2008 and may not be giving a valid picture of the current fishery and needs updating. Given the paucity of information on bycatch species in quantity and appropriateness (i.e. age of data), it is difficult to conclude that sufficient data continue to be collected to detect changes in risk to many of the retained species under SG 80d (the tuna are exceptions). Either more evidence that the current data collection programme is adequate is needed or this SG element should be rescored with additional wording in the existing Condition (#7) to address the issue.	FCI Response: in making this comment, the PR focusses only on availability of data in relation to the catch of retained species. However the report has considered other data as also presenting reliable indicators of changes in risk to retained species, including data on how the fishery operates spatially and temporally, total overall catches and catch trends, fleet capacity as well as oceanographic data including physical, chemical and biological indicators. These data are adequate in the context of assessing changes in risk to species, especially when they are considered together with other supporting recent data (collected prior to 2011) in relation to typical retained species catches on EU Indian Ocean purse seiners (as has been extensively referred to in the report). Together these data can effectively be used to monitor changes in risk to retained species. Scoring of this PISG is consistent with the text of the PISG which states (at SG80) "Sufficient data continue to be collected to detect any increase in risk level (*e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy*).
2.2.1	All UoC: Yes	All UoC: Yes	All UoC: NA	All UoC: as the AT determined that, apart from ETP species, all catches are retained, then there are no bycatch (discarded) species and the PI scores 100.	FCI Response: comments noted.

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2.2.2	All UoC: Yes	All UoC: No	All UoC: No	All UoC: There are various measures in place that achieve the SG 60 for all bycatch species. However, no evidence of a partial strategy aimed at other bycatch species is provided. Unconnected measures to release fish (with moderate to high post-release mortality), VMS, area restrictions (aimed at tuna) and restrictions on shark finning do not meet the definition of partial strategy. Either considerably more evidence of such a partial strategy is required to sustain the current score or this PI should be rescored, would likely fall below the SG 80 and a new Condition (as per Retained species) would be required. In the justification for SG 2.1.2a it is reported that Echebastar operate on-board procedures intended to reduce unwanted bycatch. These procedures are not detailed and no reference document is included in the references. In SG 2.1.2a reference is also made to a study planned for October 2013; given the date, some updated information on this project should be available for inclusion in this report.	FCI Response: The CR (v1.3) defines bycatch species as species that are not retained. As there are no bycatch species, the fishery meets with 100 at 2.2.1. The PR refers to 'other bycatch species' but does not detail what these species are. The team are not aware of such species. Conflictingly, the PR comment in relation to 2.2.1 (see above) clearly acknowledges that there are no bycatch species. The management of bycatch is considered to meet with SG80 and supporting text justifies this score adequately and scoring issues c and d are considered to meet with SG100. These scores are fully and adequately justified in the context that the team found there are no bycatch species. Reference to unconnected measures not meeting with definition of a partial strategy is simply incorrect. A partial strategy is defined in the CR as 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****".* The justification text more than adequately identifies the range of measures that are considered to work together effectively as a partial strategy. The assessment team simply do not accept the PR comment as being correct in this regard. The team also noted the PR comments with reference to PI 2.1.2a…..it is assumed that these comments are included here in error as we are dealing with PI 2.2.2 here.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
2.2.3	All UoC: Yes	All UoC: No	All UoC: No	All UoC: Most of the detailed data on Retained species is relatively old, dating from 2003-2008 and may not be giving a valid picture of the current fishery and needs updating. Given the paucity of information on bycatch species in quantity and appropriateness (i.e. age of data), it is difficult to conclude that sufficient data continue to be collected to detect changes in risk to many of the bycatch species under SG 80d. Either more evidence that the current data collection programme is adequate is needed or this SG element should be rescored with additional wording in the existing Condition (#7).	FCI Response: the shortcoming in relation to data has been captured already under 2.1.3, for which scoring has indicated that a condition of certification is required to address the short coming. The intent of the MSC CR is that the same issue is not scored twice (which would potentially lead to double penalisation). The PR refers to retained species in this comment, despite the fact that the PI deals with bycatch species – (of which none are identified in this fishery). It has been explicitly pointed out that there are no bycatch species – all species are retained except for the few that are identified and considered as ETP species. It is not appropriate to rescore the PI based on inaccurate PR commentary and misinterpretation of the standard.
2.3.1	All UoC: No	All UoC: No	All UoC: No	All UoC: A number of shark species were listed by CITES at CoP16 in 2013 and became subject to trade protection from 14th September 2014. These includes several genera and species caught in these fisheries evaluated as Retained species. All affected genera and species will need to be re-evaluated under the ETP PI. These include but may not be limited to, the oceanic white tip shark (Carcharhinus longimanus), the scalloped hammerhead shark (Sphyrna	FCI Response: the shark species referred to were all proposed for listing from September 14th 2014. This date is significantly after the site visit and scoring had taken place. Apart from this the comment is incorrect in stating that "All affected genera and species will need to be re-evaluated under the ETP PI" as the listing under CITES being referred to is not consistent with CB3.11.1 requirements concerning ETP designation. Concerning turtle bycatch, section 3.4.3 the report states "*As reported by Amande et al (2008) observations in relation to turtles were occasional and almost exclusively made on sets made on or associated with FADs or natural floating objects (referred to as 'log sets') and 95% of turtle*

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
				lewini), and manta rays of the genus Manta. Given the catches and lack of other information, it is unclear as to whether the current scoring can be retained or not once the additional sharks are included. For example, evidence will need to be provided that there is a high degree of confidence that there are no detrimental direct effects on the additional sharks for SG 80b. With the highly endangered hawksbill turtle caught in these fisheries, it is surprising that there are no data presented about how many individuals of this species are caught and released. Estimates of such data should be collected and made available to both monitor the performance of the fishery and to evidence the scale of the impact. Overall, the confidence in the assessment of the bycatch of ETP species is hampered by a lack of understanding of the observer coverage.	*encounters came from this technique of purse seining. Of those turtles captured during FAD or log associated sets, 90% of turtles were recorded as being released alive by the study. Over the period (2003-2007) less than 300 turtles are estimated to have been killed in EU tuna purse seine fisheries in the Indian Ocean. Clermont et al (2012) analysed interactions between the EU purse seine fleet and marine turtles in the Atlantic and Indian Oceans over a 15-year period. The data show that 597 turtles were caught in 9,398 sets on free schools and 6,515 sets related to FADs (15,913 total sets). 86% of all turtles were released alive into the sea. The study concludes that the observed impact of the EU tropical purse seine fishery is extremely low in comparison to other worldwide estimates of turtle mortality in industrial and artisanal fishing gears – such as pelagic long-lines, gillnets, and trawl nets – which are associated with estimated mortality rates that are several orders of magnitude higher. Overall, both direct mortality and possible indirect impacts (such as competition for forage, habitat destruction, disturbance etc.) of the freeschool fishery on turtle populations has been assessed as being negligible on the basis of available information, some of which has emanated from the Spanish Indian Ocean purse seine fishery".* Accordingly, the risk of the freeschool fishery to turtle species is considered minimal and this is reflected in the scoring of the PI, which is appropriately justified. Furthermore, a condition has been implemented under PI 2.3.3 which requires the recording of greater levels of information in relation to ETP interaction. Improved information on observer coverage has been included under Section 3 of the report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
2.3.2	All UoC: No	All UoC: Yes	All UoC: NA	All UoC: For turtles, the effectiveness of the release policy relies on a high survival rate, for which no information is presented (see 2.3.3 below).	FCI Response: the determination by the PR that the low impact of the freeschool fishery on turtle populations relies on the effectiveness of the release policy is mistaken. The determination is actually based on the low level of encounter of freeschool fisheries with turtles, as is clearly and explicitly detailed in the scoring justification. To quote from the PI text for 2.3.1 "*As reported by Amande et al (2008) observations in relation to turtles were occasional and almost exclusively made on log-sets (95%). Captures of turtles are overwhelmingly associated with FADs and floating object related sets. Despite this level of encounter in FAD sets, 90% of turtles were recorded as being released alive. Over the period (2003-2007) less than 300 turtles are estimated to have been killed in EU tuna purse seine fisheries in the Indian Ocean. This is less than 60 individuals per year. As previously indicated, the overwhelming majority of this bycatch is associated with log or FAD sets, which are not under certification here. Clermont et al (2012) analysed interactions between the EU purse seine fleet and marine turtles in the Atlantic and Indian Oceans over a 15-year period. Over the study period, 597 turtles were caught in 9,398 sets on free schools and 6,515 sets related to FADs (15,913 total sets). 86% of all turtles were released alive into the sea".* Sufficient evidence is provided that shows the freeschool fishery presents a low level of risk to turtles through capture rates, irrespective of post capture survival rates.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
2.3.3	All UoC: Yes	All UoC: No	All UoC: No	All UoC: For turtles, the effectiveness of the release policy relies on a high survival rate, for which no information appears available, and which, therefore, should be included in future data collection (e.g. as a tag-based survival study) as part of the Condition (# 7). For SG 80c, the fact that detailed information is only recent implies that these will only be able to be used to measure trends in the future, not currently. In this case this SG is not met and this PI should be rescored.	FCI Response: the determination by the PR that the low impact of the freeschool fishery on turtle populations relies on the effectiveness of the release policy is mistaken. The determination is based on the low level of encounter of freeschool fisheries with turtles, as is clearly and explicitly detailed in the scoring justification. To quote from the PI text for 2.3.1 "*As reported by Amande et al (2008) observations in relation to turtles were occasional and almost exclusively made on log-sets (95%). Captures of turtles are overwhelmingly associated with FADs and floating object related sets. Despite this level of encounter in FAD sets, 90% of turtles were recorded as being released alive. Over the period (2003-2007) less than 300 turtles are estimated to have been killed in EU tuna purse seine fisheries in the Indian Ocean. This is less than 60 individuals per year. As previously indicated, the overwhelming majority of this bycatch is associated with log or FAD sets, which are not under certification here. Clermont et al (2012) analysed interactions between the EU purse seine fleet and marine turtles in the Atlantic and Indian Oceans over a 15-year period. Over the study period, 597 turtles were caught in 9,398 sets on free schools and 6,515 sets related to FADs (15,913 total sets). 86% of all turtles were released alive into the sea.*" Sufficient evidence is provided that shows the freeschool fishery presents a low level of risk to turtles through capture events and related mortality.
2.4.1	All UoC: Yes	All UoC: Yes	All UoC: NA	All UoC: Correctly scored & evidenced.	FCI Response: comments noted.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
2.4.2	All UoC: Yes	All UoC: Yes	All UoC: NA	All UoC: Correctly scored & evidenced.	FCI Response: comments noted.
2.4.3	All UoC: No	All UoC: No	All UoC: NA	All UoC: SG 100C – there are sufficient spatial and temporal oceanographic and fisheries data to measure proxies for habitat distribution over time and space, work has been published on this. This should lead to this SG being rescored to achieve the SG 100c.	FCI Response: the assessment team were not provided with data that indicated scoring at SG100 for issues B or C during the assessment. It is not the teams function to search for data to improve scores and the score that was agreed amongst the team is based on information provided to the team during the assessment and prior to scoring. It is noted that the PR states that "*there are sufficient spatial and temporal oceanographic and fisheries data to measure proxies for habitat distribution over time and space, work has been published on this*". However no such information or any supporting references are provided in support of this statement. No change to scoring is warranted or has been made in response to this comment.
2.5.1	All UoC: Yes	All UoC: Yes	All UoC: NA	All UoC: Correctly scored & evidenced.	FCI Response: comments noted.
2.5.2	All UoC: Yes	All UoC: Yes	All UoC: NA	All UoC: Correctly scored & evidenced.	FCI Response: comments noted.
2.5.3	All UoC: Yes	All UoC: Yes	All UoC: NA	All UoC: Correctly scored & evidenced.	FCI Response: comments noted.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
3.1.1	All UoC: No	All UoC: Yes	All UoC: NA	All UoC: The role of the EU and the European Commission (EC) in the management of these fisheries has been overlooked. Text relating to EU vessels is missing from scoring element d.	FCI Response: In any case it is considered that the role of the EU has been overlooked in the justification of this indicator. Perhaps has not been sufficiently clear that the EU acts as a member of the IOTC. Thus, to clarify this point the following text IS INCLUDED in the rationale for PI: The Common Fisheries Policy of the EU stated in Article 29 of the "REGULATION (EU) No 1380/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the Common Fisheries Policy" that: "The Union shall foster cooperation among RFMOs and consistency between their respective regulatory frameworks, and shall support the development of scientific knowledge and advice to ensure that their recommendations are based on such scientific advice. In the chapter 3.5 of the PCDR (PRINCIPLE 3) page 86 to 88 the legislative framework of Indian Ocean tuna fisheries is broadly explained. This text includes a subchapter dedicated to EU legal framework and the roles that EU plays in the management of this fishery. The main roles of EU in the Indian Ocean in relation with tuna fisheries are implemented of two different ways. Fisheries Partnership Agreements (FPA) signed between EU and some coastal members including Seychelles (but not only this: Madagascar, Mozambique, Comoros and Mauritius). In the other hand, European Union is member of IOTC RFMO. IOTC manages tuna resources of the Indian and therefore, the European Union and any other member country may propose management measures are evaluated in the bosom of the IOTC. In reference to tables of rationale for PI 3.1.1 d some original information was eliminated due to a fault in the reporting template. This has now been corrected. Additional text has also been added in the rationale of 3.1.1 to

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
					strengthen information about the role of the EU in this fishery.
3.1.2	All UoC: No	All UoC: No	All UoC: No	All UoC: The text describing the consultation process at the national level suggests that this should not meet the SG 80 guidepost for scoring elements b or c. Either more evidence of such processes is required or these elements needs to be rescored and a new Condition raised to improve the national consultation processes. Consultation processes of the EU and the EC in the management of these fisheries has been overlooked.	FCI Response: the justification text has been substantially revised as the teams deliberations resulted in scoring at SG80 for all scoring issues. Apparently however the justification text did not clearly enough support the score. Stakeholder consultations are held on a regular basis regarding the development of the sector. The SFA works in close collaboration with Ministry Natural Resources, Ministry of Environment and Energy, Seychelles Coast Guard, Seychelles Ports Authority, other Government institutions, fishermen and boat owners associations, NGO's as well as overseas partners. **http://www.sfa.sc/aboutus.jsp#ouractivities.** In reference to EU and EC processes clarification has been added that the main consultation process is established through the Long Distance Regional Advisory Council (LDRAC).
3.1.3	All UoC: Yes	All UoC: Yes	All UoC: NA	All UoC: Correctly scored & evidenced.	FCI Response: comments noted.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
3.1.4	All UoC: No	All UoC: Yes	All UoC: NA	All UoC: There is widely accepted perception that the EU subsidises the building of fishing vessels. In order to clarify the position for this fleet, the statement about a lack of EU subsidy for this fleet should include specific statements about the presence or absence of subsidy for (i) the original cost of building the vessels in this fleet and (ii) the proposed replacement of capacity with new vessels (as described in the main text)?	FCI Response: Regulation (eu) no 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund includes Article 11 not eligible under the EMFF, the following operations (among other): • operations increasing the fishing capacity of a vessel or equipment increasing the ability of a vessel to find fish; • the construction of new fishing vessels or the importation of fishing vessels
3.2.1	All UoC: Yes	All UoC: Yes	All UoC: NA	All UoC: Correctly scored & evidenced.	FCI Response: comments noted.
3.2.2	All UoC: No	All UoC: No	All UoC: NA	All UoC: There is no reference to the EU/EC or national Seychelles roles in stakeholder engagement under scoring element d. Some text describing recent application of the Seychelles Fisheries Act in dealing with challenge would be informative to support the score for element e.	FCI Response: Regarding section d, only reference to the IOTC is because decisions about the management of the fishery are made within the organization and, therefore, Formal reporting to all interested stakeholders is made entirely from the IOTC. Seychelles and the EU, as members of the IOTC are implicitly part of this process. We consider the justification for a score of 80 in 3.2.2 e as robust.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
3.2.3	All UoC: No	All UoC: No	All UoC: No	All UoC: Some details of the SFA observer programme over recent years would be informative with respect to SG element a. For SG element b, more details of what sanctions are available and evidence to support the statement the national implementation of these is consistently applied are required to justify the score given at the SG 80 level. Otherwise this element should be rescored and a new Condition raised. For scoring element c, it is stated that some evidence exists to demonstrate compliance. This evidence is, however, not described or presented. In order to sustain the score given, the evidence referred to is required to be presented or the element should be rescored and a new Condition raised.	FCI Response: SFA has a section focused to MCS with two sub-units: The Monitoring and Control Unit and the Enforcement Unit. The Enforcement Unit carries out all inspectorate duties with regards to port state inspection, land inspection, sea and air surveillance duties pertaining to national and regional requirements. For SG element b, agree with SFA web page, port state control has been one of the strong points of Seychelles even before the creation of the MCS section. Despite this fact the overall approach to port state control was reviewed in 2009, concentrating on an investigative rather than an informative approach. The results have been positive since several infractions have since been detected. The results have been positive since then with detection of infractions and in one case it resulted the capturing of the Sri Lankan flag fishing vessel Lucky Too in 2012. The vessel was fined SCR 100,000.00.
3.2.4	All UoC: No	All UoC: No	All UoC: No	All UoC: For scoring element a, it is stated that none of the management agencies (IOTC, EU or SSFA) have a defined research plan addressing research issues in a strategic manner. Reliance on the IOTC SC to define appropriate research will provide for some elements of research planning but is insufficient to meet the SG80 for this scoring	FCI Response: It is considered that research guidelines IOTC are sufficiently robust and directed to the proper management of stocks. The scientific committee has, among other duties, develop and coordinate cooperative research programs Involving Members of the Commission and other interested parties, in support of fisheries management. The scientific committee is proactive and responds to a workplan endorsed by the SC at each annual meeting. In addition,

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
				element without a more strategic approach or supporting plans from the other agencies. This element should be rescored and a new Condition raised to develop a medium- or long-term, strategic research plan that encompasses these fisheries. There is no mention of the approach to the dissemination of research results by the EU/EC, SFA or the client fishery, all of which conduct research and should be included in scoring element b.	the IOTC has numerous research programs currently in progress: • CSIRO Australia: Wealth from oceans • MADE Project • UMR 212 "écosystèmes marins exploités" • IRD's monitoring of the tuna purse seiners operating in the Indian and Atlantic Oceans • CLIOTP global program and other, already completed. In reference to element b, the EU and the SFA publicly disseminate the results of their research and the results of the resolutions of the IOTC Therefore, it is considered that the SG80 is achieved for this indicator.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
3.2.5	All UoC: No	All UoC: No	All UoC: No	All UoC: For scoring element a, there is no mention of reviews of the either the EU or client fishery management components. For example, it is reported elsewhere that the client fishery implements various activities to, for example, reduce bycatch: such management activities should be subject to review to ensure that they are delivering as intended and also to identify areas where improvements can and should be made. If not included as part of a Condition, this should at least be included as a recommendation to the Client fishery. Depending on the evidence for review added to the justification, this PI may need rescoring and a corrective Condition developed.	FCI Response: We consider that for this PI and given that the context of this fishery management is focused on the IOTC, evaluation mechanisms of the same should be directed from the RFMO. Therefore we do not consider that relating to client performance elements, such as by-catch, should be evaluated under the MSC P3. As described in the justification, if there is a system of monitoring and evaluating the performance of the fishery-specific management system. In this sense the SG80 reached must be maintained.
					FCI Response: We consider that for this PI and given that the context of this fishery management is focused on the IOTC, evaluation mechanisms of the same should be directed from the RFMO. Therefore we do not consider that relating to client performance elements, such as by-catch, should b FCI Response: We consider that for this PI and given that the context of this fishery management is focused on the IOTC, evaluation mechanisms of the same should be directed from the RFMO. Therefore we do not consider that relating to client performance elements, such as by-catch, should be evaluated under the MSC P3. As described in the

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
					justification, if there is a system of monitoring and evaluating the performance of the fishery-specific management system. In this sense the SG80 reached must be maintained evaluated under the MSC P3. As described in the justification, if there is a system of monitoring and evaluating the performance of the fishery-specific management system. In this sense the SG80 reached must be maintained

Any Other Comments

Comments	Certification Body Response
The order in which the three species appear in the main text (SKP, YFT then BET) is different from the order presented I the scoring tables (YFT, SKP then BET) which hinders the reader in referring back to the text. The AT should consider reordering either the main text or the scoring tables. As there are three stocks being considered, there are often three figures showing the same information (e.g. Kobe plots) but they are not all labelled to identify the stock (species). The AT should review all figures and tables to ensure that each has a clear stock identifier, preferably in the same location on each. There are several areas where there is duplicated text that could be condensed. In section 3.3.1.1. a Figure 2 is referenced when there is no Figure 2 (possibly Figure 3.3.1). Similarly, a Table 1 is referenced (possibly Table 3.3.2), and there is a table associated with the figure legend for Figure 3.3.1 which has no table legend. Sentence five in the text on BET habitat (section 3.3.3.2) is confused and needs editing to provide clarity of meaning.	**FCI Response:** the order of presentation of information on SKJ, YFT and BET has been harmonised between the main report body and the assessment tree. Figures have been reviewed and labelled accordingly where labels were missing. Text is duplicated on account of reporting requirements. If text is condensed critical commentary is likely to follow this course of action. The report includes all information required for all 3 species, even though this may be repetitive in places. Figure and table headings have been reviewed and labelling issues addressed. Sentence referred to in 3.3.3.2 has been amended.

Appendix 3. Stakeholder submissions

a. Written submissions from stakeholders received during consultation opportunities on the announcement of full assessment, proposed assessment team membership, proposed peer reviewers, proposal on the use or modification of the default assessment tree and use of the RBF.

Proposed Assessment Team Membership

IPNLF - John Burton,

Sent: Tue 01/02/2013 07.54
To: FCI Fisheries Department
From: John Burton (IPNLF)
Subject: Echebaster

Dear Ms Kabut,

Please find attached (below) the registration of the International Pole and Line Foundation as a stakeholder in the fishery "Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery".

Please keep us informed on the progress of the fishery in the assessment.

We have completed the section of the form related to the nomination of team members.

We have reviewed the details presented for the individuals, and we consider that none of them meet the MSC criteria and the team does not have the required expertise, experience and skills to carry out the audit.

We look forward to reviewing the three new nominations.

Kind regards,

John

Section 1

Assessment Stage	Fishery	Date	Name of Commenter or Organisation
Fishery announcement and stakeholder identification[i] Opportunity to indicate that you are a stakeholder and identify other stakeholders	Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna	29 January 2013	IPNLF

Nature of Comment (select all that apply)		Additional Information/Detail Please attach additional pages if necessary.
e.g. ☒ ☒	I wish to indicate that I am a stakeholder in this fishery, please keep me informed about each stage of the assessment process	Our interest is in the sutainable long term harvest of tuna resources
☐	I wish to suggest information or documents important for the assessment of this fishery *(you may either attach documents or provide references)*	
☐	I wish to suggest other individuals or organizations who should be considered stakeholders in the MSC assessment of this fishery *(please name them with contact information)*	
☐	Other (please specify)	

Section 2

Assessment Stage	Fishery	Date	Name of Commenter or Organisation
☒ Assessment team formation[ii] Opportunity to comment on the assessment team	Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna	29 January 2013	IPNLF
☐ Client and peer review[iii] Opportunity to comment on proposed peer reviewers			

Nature of Comment (select all that apply)		Justification Please attach additional pages if necessary.
☒	I believe this team member/peer reviewer does not have appropriate demonstrated technical expertise to perform this role[iv] *(please provide justification as to why)*	We consider that nominated team members do not have the expertise, skills and experience as defined in MSC Certification Requirements v1.3 of January, 2013 (Section 27.5). This assessment started before March 13, 2013 and thus clauses under Para 27.5.1 are effective. However, we have considered Annex CM of v1.3 and we refer to this in the comments below as it requires a similar standard. Mr Keatinge is the nominated P1 specialist in tuna fisheries in the Indian Ocean. Following close review of the CVs and publications list, we do not consider that he or any of the team meet the qualifying criteria of "Five years or more experience applying relevant stock assessment techniques being used by the fishery under assessment OR Primary authorship of two peer reviewed stock assessments of a type used by the fishery under assessment". Nor is there any evidence that Mr Keatinge or any of the team has "Five years or more experience working with the biology and population dynamics of the target or species with similar biology". While Mr Keatinge's CV refers to membership of the "STECF sub group responsible for the evaluation of management advice for all EU fisheries; with particular responsibility for tuna stocks in the Pacific, Indian and Atlantic oceans" there is no evidence that he has expertise in the fisheries to be assessed. His current position with BIM and the lack of any reports on tuna would indicate that his skills and experience are not relevant to the fisheries under assessment. Mr Pfeiffer is nominated as lead auditor and P2 specialist. There is no evidence that he has passed MSC's fishery team leader training course every 3 years nor that he has passed MSC's annual fishery team leader training on
☐	I believe a team member/peer reviewer has a conflict of interest *(please provide justification as to why)*	
☐	I wish to propose alternative or additional team member(s)/peer reviewer(s) (please include relevant details about your proposed team members/peer reviewers)	

Nature of Comment (select all that apply)		**Justification** Please attach additional pages if necessary.
☐	Other (please specify)	updates to the fishery requirements. It is noted that he has participated on a number of MSC assessments these are not listed and it is not clear if he has any experience as team leader. While it does not appear to be a requirement of the P2 specialist we note that Mr Pfeiffer does not appear to have any experience in tunas, the Indian Ocean or purse seining. Mr Ambrosio is the nominated P3 expert. We do not consider that his experience is relevant to the criteria required of the P3 expert i.e. Five years or more experience as a practicing fishery manager and/or fishery/ policy analyst. We are concerned that his skills will not facilitate the identification of likely problems for fishery under P1 and P2 that would arise from poor management nor does the information provided for him demonstrate a good understanding of the types of management system(s) and laws applicable to the fishery under assessment. MSc requires that a member of the team is able to explain the elements of traceability which are relevant to fishery assessments. There is no evidence that any of the team has any experience whatsoever in chain of custody audits related to traceability. While at this stage it is not known if the RBF will be used for any PI; if this was to be the case it appears that no team member has the required experience or training. MSC requires experience in the region of the fishery. The only one of the three nominated experts with defined experience in the region is Mr Ambrosia and the link between this limited work and fisheries management is tenuous.

WWF

Sent: Tue 01/02/2013 14.39
To: FCI Fisheries Department
From: Wetjens Dimmlich, WWF
Subject: Comments: Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

Dear Joanna

Please find attached (below) WWF comments on the proposed assessment team for the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery.

Regards

Wetjens Dimmlich, WWF Indian Ocean Tuna Coordinator

Ref: WWF Comments to the Proposed Assessment team for Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

Dear Joanna,

WWF is committed and focused on improving the sustainability of tuna fisheries in the Indian Ocean (IO) through our network. Please find attached our comments on the proposed assessment team for the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery.

Thank you for the opportunity to comment on the assessment process for this fishery.

Sincerely,

Dr Wetjens Dimmlich and José Luis García Varas

Section 2

Assessment Stage	Fishery	Date	Name of Commenter or Organisation
☒ Assessment team formation[ii] Opportunity to comment on the assessment team	Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery	28/01/2013	WWF
☐ Client and peer review[iii] Opportunity to comment on proposed peer reviewers			

Nature of Comment (select all that apply)		Justification (Please attach additional pages if necessary.)
☒	I believe this team member/peer reviewer does not have appropriate demonstrated technical expertise to perform this role[iv] *(please provide justification as to why)*	MSC Certification Requirements v1.2, 27.5.2.1 require team expertise including: "more than five years' experience in the production of peer reviewed stock assessment(s) for relevant fishery(ies), and stock assessment techniques(s) being used by the applicant fishery." For the proposed team the CAB has provided no evidence to show that any team members have more than five years' experience is the production of peer reviewed stock assessments. For example, the proposed P1 specialist has only "a deep interest in statistics and population modelling". We find no peer reviewed publications cited in the CV for the P1 expert with any relevance to the stock assessment for relevant fisheries. We see only that the P1 expert has developed a "deep understanding of all the major fish stocks fished by the Irish fleet" but the CAB has not provided rationale in support of the relevance of an understanding of Irish fleet fisheries to Indian Ocean tuna fisheries. MSC Certification Requirements v1.2, 27.5.2.2 require team expertise including: "more than five years research expertise in the biology and ecology of the target or similar species." For the proposed team the CAB has provided no evidence to show that any team members have more than five years research expertise in the biology and ecology of skipjack, yellowfin or bigeye tuna species. If there is believed to be sufficient research experience with similar species within the proposed team, this is not supported by evidence.
☐	I believe a team member/peer reviewer has a conflict of interest *(please provide justification as to why)*	
☐	I wish to propose alternative or additional team member(s)/peer reviewer(s) (please include relevant details about your proposed team members/peer reviewers)	
☐	Other (please specify)	

Proposed Peer Reviewers

John Burton, IPNLF

Sent: Tue 22/11/2013 07.54
To: FCI Fisheries Department
From: John Burton (IPNLF)
Subject: FCI to Stakeholders - Peer Reviewer Nominations - Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery - 20 11 13

Dear Sirs,

We have some concerns regarding conflict of interest.
Please see herewith.

I look forward to hearing from you.

Kind regards

John

Section 2

Assessment Stage	Fishery	Date	Name of Commenter or Organisation
☒ Assessment team formation[ii] Opportunity to comment on the assessment team			
☐ Client and peer review[iii] Opportunity to comment on proposed peer reviewers	Echebastar Indian Ocean Tuna Fisheries (all)	22/11/2013	John Burton

Nature of Comment (select all that apply)		Justification Please attach additional pages if necessary.
☐	I believe this team member/peer reviewer does not have appropriate demonstrated technical expertise to perform this role[iv] *(please provide justification as to why)*	
☒	I believe a team member/peer reviewer has a conflict of interest *(please provide justification as to why)*	Ronan Cosgrove works at BIM. This is the same institution as Michael Keatinge, one of the assessment team members, and so he may be open to discussions etc. which could compromise his independence.
☐	I wish to propose alternative or additional team member(s)/peer reviewer(s) (please include relevant details about your proposed team members/peer reviewers)	Alain Fonteneau has worked directly for IOTC and so may not provide an independent view on the fishery.
☐	Other (please specify)	

WWF

Sent: Tue 01/02/2013 14.39
To: FCI Fisheries Department
From: Wetjens Dimmlich, WWF
Subject: Comments: Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

Dear Joanna

Please find attached (below) WWF comments on the proposed assessment team for the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery.

Regards

Wetjens Dimmlich, WWF Indian Ocean Tuna Coordinator

Ref: WWF Comments to the Proposed Assessment team for Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

Dear Joanna,

WWF is committed and focused on improving the sustainability of tuna fisheries in the Indian Ocean (IO) through our network. Please find attached our comments on the proposed assessment team for the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery.

Thank you for the opportunity to comment on the assessment process for this fishery.

Sincerely,

Dr Wetjens Dimmlich and José Luis García Varas

Intent to Review Fishery Information

John Burton, IPNLF

Sent: Tue 25/09/2014 06.51
To: FCI Fisheries Department
From: John Burton (IPNLF)
Subject: RE: FCI to Stakeholders - Intent to Review Information - Echebastar Indian Ocean Tuna

Dear Sirs,

We have various issues in relation to the interaction of the purse seine fishery (free school and FADs) with various ETP species.

I would point you to the recently published report (http://ipnlf.org/wp-content/uploads/2014/09/IPNLF-Cetaceans-Tuna-Fisheries-2014_Final.pdf) written by Dr Charles Anderson, which I attach to this email.

I look forward to receiving your response in due course.

Kind regards,

John

b. All written and a detailed summary of verbal submissions received during site visits pertaining to issues of concern material to the outcome of the assessment[3] regarding the specific assessment.

None.

c. Explicit responses from the assessment team to submissions described in **a.** and **b.** above.

Proposed Assessment Team Membership

John Burton, IPNLF

Sent: Tue 18/02/2013 17.15
To: John Burton, IPNLF
From: Joanna Kabut, FCI
Subject: RE: Echebaster

Dear Mr J. Burton,

Thank you very much for your comments, which have had been considered by the Development Manager alongside other written comments received.

You indicated that none of the assessors meet the MSC criteria and the team does not have the required expertise, experience and skills to carry out the audit. Please find below a response from our Development Manager;

IPNLF: We consider that nominated team members do not have the expertise, skills and experience as defined in MSC Certification Requirements v1.3 of January, 2013 (Section 27.5). This assessment started before March 13, 2013 and thus clauses under Para 27.5.1 are effective. However, we have considered Annex CM of v1.3 and we refer to this in the comments below as it requires a similar standard.

FCI Response: *FCI has evaluated the comments received regarding the assessment team. FCI has rejected the International Pole & Line Foundation comments. Responses are provided individually for each of the comments received.*

IPNLF: Mr Keatinge is the nominated P1 specialist in tuna fisheries in the Indian Ocean. Following close review of the CVs and publications list, we do not consider that he or any of the team meet the qualifying criteria of "Five years or more experience applying relevant stock assessment techniques being used by the fishery under assessment OR Primary authorship of two peer reviewed stock assessments of a type used by the fishery under assessment". Nor is there any evidence that Mr Keatinge or any of the team has "Five years or more experience working with the biology and population dynamics of the target or species with similar biology". While Mr Keatinge's CV refers to membership of the "STECF sub group responsible for the evaluation of management advice for all EU fisheries; with particular responsibility for tuna stocks in the Pacific, Indian and Atlantic oceans" there is no evidence that he has expertise in the fisheries to be assessed. His current position with BIM and the lack of any reports on tuna would indicate that his skills and experience are not relevant to the fisheries under assessment.

FCI Response: Dr. Michael Keatinge expanded CV attached provide evidence that he comply with the following:

1. Five years or more experience applying relevant stock assessment techniques being used by the fishery under assessment OR primary authorship of two peer reviewed stock assessment of a type used by the fishery under assessment.
2. Five years or more experience working with the biology and population dynamics of the target or species with similar biology.

IPNLF: Mr. Pfeiffer is nominated as lead auditor and P2 specialist. There is no evidence that he has passed MSC's fishery team leader training course every 3 years nor that he has passed MSC's annual fishery team leader training on updates to the fishery requirements. It is noted that he has participated on a number of MSC assessments these are not listed and it is not clear if he has any

experience as team leader. While it does not appear to be a requirement of the P2 specialist we note that Mr Pfeiffer does not appear to have any experience in tunas, the Indian Ocean or purse seining.

FCI Response: *Mr. Pfeiffer has acted as P2 expert and as Team Leader in a large number of MSC full assessment. Mr Pfeiffer has used the RBF in two full assessments (Surinam Seabob and Celtic Sea Sardine) and Mr Pfeiffer will undertake the RBF training on the 28th of February 2013. Following the list of MSC full assessment in which Mr. Pfeiffer has participated as P2 and P2/TL is attached.*

IPNLF: Mr Ambrosio is the nominated P3 expert. We do not consider that his experience is relevant to the criteria required of the P3 expert i.e. Five years or more experience as a practicing fishery manager and/or fishery/ policy analyst. We are concerned that his skills will not facilitate the identification of likely problems for fishery under P1 and P2 that would arise from poor management nor does the information provided for him demonstrate a good understanding of the types of management system(s) and laws applicable to the fishery under assessment.

FCI Response: *Luis Ambrosio is an experienced Policy Analyst. His expertise illustrates evidence of having a good understanding of the fishery management systems that the fishery under assessment is subject to. Luis experience of relevancy to this assessment is presented below.*

- *Europe, 2010/12: Adviser for the project named: Analytical and Advocacy work in Spain on CFP reform. WWF European Policy Office, Fisheries Policy; support to stakeholders; Drafting of policy documents*
- *Latin America, Africa, 2010: Study about the presence, strategies and socio economic impact of EU fishing companies in the world. WWF, Fisheries Policy. During this project the following countries were visited; Peru, Chile, Argentina, El Salvador, Angola, Namibia, South Africa and Mozambique.*
- *Spain, 2009/2010: Technical Fisheries Consultant for FCP Reform during EU Spanish Presidency for OCEAN2012 Coalition. PEW environmental Trust , Fisheries Policy; support to stakeholders*
- *Spain, 2007/08: Study of competitiveness of the Spanish fishing fleets that they work out of the European Community waters opposite to vessels of third countries. Spanish Fisheries Confederation CEPESCA, Fisheries Management*
- *2006/2007: Office coordinator for the Monitoring and Control of the Atlantic Ocean's Spanish long line fleet targeting mainly tuna and shark species(Office based in Montevideo-Uruguay)2006/2008: Office coordinator for the Monitoring and Control of the Atlantic Ocean's Spanish purse seiner fleet targeting mainly tuna species (Office based in Dakar-Senegal)*
- *Lithuania, 2006: EU Phare Project: Training of relevant staff in methodologies of grading and control of grading of fishery products according to marketing standards. Short Term Expert, Fisheries Policy; Drafting of policy documents*
- *Romania, 2006: EU Phare Project: Support for further strengthening of the market for fisheries and aquaculture products in Romania. Short Term Expert, Fisheries Policy; Drafting of policy documents*
- *Spain, 2006: Co-author of the Fisheries White Paper of Spain (Chapter: Spanish External Fleet). Spanish Secretariat of Marine Fisheries, Fisheries Policy; Drafting of policy documents*
- *Spain, 2006: Analysis of the Horizontal Integration Principles in the European Fisheries Fund. Spanish Secretariat of Marine Fisheries. Ministry of Agriculture, Fisheries and Food, Fisheries Policy*
- *African countries, 2004: "Cost-benefit Analysis in the case of the fishing agreements concerning tuna boats signed between the EU and African countries on the coastline". Spanish Secretariat of Marine Fisheries. Ministry of Agriculture, Fisheries and Food., Fisheries Policy*
- *Mauritania, 2004: Cost-benefit analysis in the case of the Fishing Agreement between the European Union and Mauritania. Spanish Secretariat of Marine Fisheries. Ministry of Agriculture, Fisheries and Food, Fisheries Policy*
- *Angola, 2004: Cost-benefit Analysis in the case of the Fishing Agreement between the European Union and Angola. Spanish Secretariat of Marine Fisheries. Ministry of Agriculture, Fisheries and Food, Fisheries Policy*
- *Romania, 2003/04: EU Phare Project, Strengthening Romania's Capacity for Restructuring of Fisheries and Aquaculture, Fisheries Policies; Drafting of policy documents*

- » *Spain, 2003: Control of the Activity of Fleets that fish in African Atlantic waters in the area between the Ivory Coast and Morocco. WWF, Fisheries policies*
- » *Spain, 2001/02: Study regarding the big pelagic fishing fleets. Effects on the EU fishing agreements and on the world fish meal market. Ministry of Agriculture, Fisheries and Food., Fisheries Management*
- » *Spain, 2001: Environmental appraisal of FIFG Programmes: Spain." (Environmental implications of the application of the European Union structural funds for fishing in Spain 2002-2006). Institute for European Environmental Policy (IEEP)., Subsisies Analisys*

IPNLF: MSc requires that a member of the team is able to explain the elements of traceability which are relevant to fishery assessments. There is no evidence that any of the team has any experience whatsoever in chain of custody audits related to traceability.

FCI Response: *Mr. Paul Macintyre fully qualify to assess the elements of traceability of the fishery. Please see Paul CV included in the proposed assessment team.*

IPNLF: While at this stage it is not known if the RBF will be used for any PI; if this was to be the case it appears that no team member has the required experience or training.

FCI Response: *Mr Pfeiffer has used the RBF in two full assessments (Surinam Seabob and Celtic Sea Sardine) and Mr Pfeiffer will undertake the RBF training on the 28th of February 2013*

IPNLF: MSC requires experience in the region of the fishery. The only one of the three nominated experts with defined experience in the region is Mr Ambrosio and the link between this limited work and fisheries management is tenuous.

FCI Response: *Mr Ambrosios professional experience provides evidence of required fishery work experience in Spain and relevant fisheries (work experience with tuna fisheries listed above).*

I hope this answer your questions however if you have any further questions please do not hesitate to contact me.

Kind regards.
Joanna Kabut, Fisheries Administrator, FCI

WWF

Sent: Tue 18/02/2013 17.05
To: Wetjens Dimmlich, WWF
From: Joanna Kabut, FCI
Subject: RE: Comments: Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

Dear Dr W. Dimmlich,

Thank you very much for your comments, which have had been considered by the Development Manager alongside other written comments received.

You indicated the absence of evidence with regard to show that team members have more than five years' experience is the production of peer reviewed stock assessments.

Please find below a response from the Development Manager;

Dr. Michael Keatinge provide evidence (a copy of Dr M. Keating's CV is attached) that he comply with Team Expert credentials required by the Certification Requirements (CR) v 1.3:

1. *Five years or more experience applying relevant stock assessment techniques being used by the fishery under assessment OR primary authorship of two peer reviewed stock assessment of a type used by the fishery under assessment.*
2. *Five years or more experience working with the biology and population dynamics of the target or species with similar biology*

Although the CR v 1.3 is not coming into effect until March 2013 CABs can implement it already. Therefore FCI decided to follow the CR v 1.3 requirements for Team Selection. FCI understand that Michel Keating is an extremely well experienced stock assessment expert for tuna species which implies having experience working with the biology and population dynamics of tuna species.

I hope this answer your questions however if you have any further questions please do not hesitate to contact me.

Kind regards.

Joanna Kabut, Fisheries Administrator, FCI

Official complaint received from IPNLF dated 18th March 2013 - Ref Proposed Assessment Team Membership

1. FCI Official Complaint Form received

FOOD CERTIFICATION INTERNATIONAL LTD
Findhorn House, Dochfour Business Centre, Dochgarroch, Inverness, IV3 8GY, Scotland, UK
Tel: +44 (0) 1463 223 039 Fax: +44 (0) 1463 246 380 www.foodcertint.com

FCI Fisheries Complaints Form

If at any time you have cause for complaint please fill in the information requested below and return the completed form to Melissa McFadden, Fisheries Manager to the above address or by email to Melissa.macfadden@foodcertint.com.

Once received, we will acknowledge your complaint within 10 working days of receipt and will provide a detailed response within 20 working days of the acknowledgement. Some complaints may take longer to process, but we will keep you informed of this, reasons for the delay and revised time scales. We treat complaints seriously and we will aim to resolve your complaint at this stage, and we hope that you will not then need to progress beyond this first step.

Please fill in the details below and tick the box concerning the nature of your complaint:

Name:	John Burton
Address:	2-6 Cannon St London EC4M 6YH
Organisation:	IPNLF
Email:	John.Burton@ipnlf.org
Telephone no:	
Fishery Assessment:	☑ if you ticked this box please fill in the fishery name below:
Fishery name:	Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna
FCI:	☑
Other:	☐

FOOD CERTIFICATION INTERNATIONAL LTD

Complaint details:

1. On January 22, 2013 a main assessment for the captioned fishery was announced on the MSC web site as was the notice of the nomination for the assessment team.
2. On February 1, 2013, IPNLF registered as a stakeholder in the fishery and commented on the nominated team "We consider that nominated team members do not have the expertise, skills and experience as defined in MSC Certification Requirements v1.3 of January, 2013 (Section 27.5)".
3. On February 18, 2013, FCI responded that "FCI has evaluated the comments received regarding the assessment team. FCI has rejected the International Pole & Line Foundation comments". Specific comments were made to justify the nomination of the individual team members.
4. Subsequently, there were a number of e-mails in which we reiterated our concerns about the suitability of the nominated P1 expert as in our strong view he does not meet the MSC requirement; while FCI continued to insist that he does.
5. MSC requires that the P1 expert meets two criterion: (i) "Five years or more experience applying relevant stock assessment techniques being used by the fishery under assessment" or "Primary authorship of two peer reviewed stock assessments of a type used by the fishery under assessment" and (ii) "Demonstrate knowledge of, and ability to interpret, scientific information relating to the biological processes of the target species, or species with similar population dynamics". We have reviewed Mr Keatinge experience. We conclude that he meets the second requirement through his work as Chairman and Rapporteur on the Albacore working group over an extended period of time. We see no evidence that he meets the first requirement. Despite repeated requests FCI has failed to provide any proof that we are mistaken. Mr Keatinge works full time with BIM; he is not a stock assessment expert. We have seen no evidence that he has authored papers covering the required subject matter; they are not in his CV. It is possible that he requested /reviewed such reports - he has not APPLIED the stock assessment techniques. FCI sent us ONE (not the required two) example of "peer reviewed" work - THIS DOES NOT INDICATE THAT HE WAS PRIMARY AUTHOR.
6. On that basis, our complaint is that FCI has FAILED to apply the MSC standard in relation to the selection of the experts that comprise the assessment team and has not provided justification for the team nominations. Furthermore FCI has FAILED to respond adequately to stakeholder comments.

Signed:

Date: 18/03/13

We appreciate feedback and are committed to resolving all complaints quickly and fairly.

2. FCI Complaint response

FOOD CERTIFICATION INTERNATIONAL LTD
Findhorn House, Dochfour Business Centre, Dochgarroch, Inverness, IV3 8GY, Scotland, UK
Tel: +44 (0) 1463 223 039 Fax: +44 (0) 1463 246 380 **www.foodcertint.com**

28th March 2013

Mr. John Burton,
IPNLF
2-6 Cannon Street
London
EC4M 6YH

Ref: Complaint regarding the team selection to undertake the MSC assessment of the Echebaster Indian Ocean tuna fisher.

Dear Mr. Burton

Thank you for completing and submitting the FCI Fisheries Complaint Form which has been passed to me for response.

It is quite clear that this particular full assessment is going to incur close scrutiny throughout the full assessment process from a wide range of stakeholders and FCI has an excellent track record of pro-actively engaging with stakeholders in a positive manner throughout the full assessment process and we look forward to that continuing in the case of this fishery.

It is in FCI's interest to put in place an experienced assessment team to ensure that the result of the assessment against the requirements of the MSC Sustainable Fishing Standard has been made in as professional, independent and un-biased way as possible regardless of the eventual outcome. This I can assure you we will aim to achieve.

I have reviewed in detail the correspondence and submissions that you have made to the FCI Fisheries team relating to the proposed composition of the assessment team selected to undertake the full assessment of the Echebaster Indian Ocean purse seine.

I am satisfied that the nominated assessment team meets the criteria set down in the MSC methodology in order to provide a strong blend of expertise both in the implementation of the MSC assessment methodology as well knowledge and understanding of the fishery under assessment.

A company incorporated in Scotland – No SC313289
Registered address: Findhorn House, Dochfour Business Centre, Dochgarroch, Inverness, IV3 8GY, Scotland, UK
Template Version 1.0 (19/09/10)

FOOD CERTIFICATION INTERNATIONAL LTD

I notice that you have agreed in your complaint details that the proposed P1 expert meets the criteria which we should, I believe, both consider to be of paramount importance in appointing an expert team member for an MSC full assessment and that is to be able to "demonstrate knowledge of, and ability to interpret, scientific information relating to the biological process of the target species, or species with similar population dynamics".

As we move along the assessment process there will be several opportunities to judge the abilities of the assessment team to interpret relevant information, assess and score the fishery against the scoring criteria of the MSC standard and to fully justify their conclusions.

Their conclusions will be independently peer reviewed and then opened to public comment from stakeholders such as yourself, I would urge you to accept the assessment team as proposed and to continue to participate throughout the process so that all parties are satisfied that due process has been followed when it comes to the outcome.

As you are aware should you disagree with my conclusions you are entitled to take this complaint to ASI as the accreditation body responsible for oversight of MSC CAB performance.

Best regards

Martin Gill
Managing Director
Food Certification International Ltd
Mail: martin.gill@foodcertint.com

A company incorporated in Scotland No SC313289
Registered address: Fathom House, Dochfour Business Centre, Dochgarroch, Inverness, IV3 8GY, Scotland, UK

3. ASI Complaint Investigation Report

asi Accreditation Services International GmbH, Bonn, Germany

ASI Complaint Investigation Report

IPNLF Complaint about the MSC Assessment of the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery by FCI

ASI Complaint Number: COMP201304105

Colin Brennan

25 April 2013

1 Summary

This report summarizes an ASI investigation into a complaint lodged by John Burton of the International Pole and Line Foundation (IPNLF) regarding the MSC assessment of the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery by the accredited certification body (CB) Food Certification International (FCI). In an email to ASI on the date of April 1, the complainant lodged a formal complaint against FCI on the basis that the nominated P1 expert for the fishery in question did not have the required background and experience specified in MSC CR Version 1.3. ASI examined IPNLF's concerns against relevant MSC scheme requirements to determine whether the CB was in compliance with certification and accreditation requirements or not. After reviewing information supplied by both the complainant and FCI, ASI found that the CB's certification activities were conducted in conformity with the relevant MSC scheme requirements that were in force at the time and specified in the initial fishery announcement.

2 Background

2.1 Complaint

The complainant is John Burton of the International Pole and Line Foundation, a non-profit organization based in London, United Kingdom. Mr. Burton initially submitted his complaint about assessment team qualifications to FCI on March 18th, 2013. FCI responded to the complaint on March 28th stating that the assessment team qualifications met MSC requirements but that Mr. Burton was entitled to lodge a formal complaint with ASI. Mr Burton was not satisfied with FCI's response and on April 1st filed an official complaint with ASI regarding FCI's assessment procedures.

2.2 Certification Body

Food Certification International (FCI) is a Certification Body (CB) based in Inverness, United Kingdom. FCI is accredited by ASI for the scope of MSC fishery certification and MSC chain of custody certification worldwide (ASI accreditation code: ACC-MSC-011).

2.3 Fishery

At the center of this complaint is the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery. The fishery entered into assessment on 22 January 2013. The proposed fishery is made up of 6 units of certification harvesting Skipjack, Yellow Fin and Bigeye tuna in FAO areas 51 & 57 in the Indian Ocean.

2.4 Role of ASI and Scope of Investigation

Accreditation Services International GmbH (ASI) is the designated accreditation body (AB) for the Marine Stewardship Council. As such, ASI is charged with oversight of CBs operating MSC certification programs for fisheries and chain of custody. Accreditation oversight includes regular auditing and evaluation of CB activities for conformity with MSC requirements. In addition to MSC scheme documents, ASI evaluates general accreditation requirements that MSC has incorporated into their scheme. For example, MSC has adopted the internationally recognized standards ISO Guide 65 and ISO Guide 19011. These normative references, together with MSC scheme documents, comprise the "scope" of ASI's complaint investigation.

The investigation was conducted in accordance with the ASI complaints procedure, ASI-PRO-20-104 Complaint v3.0. This procedure requires that ASI handle complaints independently of MSC's dispute resolution mechanism.

Ultimately, the goal of this investigation was to determine whether or not the CB complied with MSC certification and accreditation requirements. ASI looked for objective evidence of CB compliance. This was based primarily on review of documentation provided by the complainant and FCI. The focus of the complaint was on MSC CR version 1.3, Annex CM (Fishery Team Leader, Team Member, Team and Peer Reviewer Qualifications and Competencies). Specifically the qualifications required for Principle 1 experts.

3 Investigation

3.1 Qualifications of Nominated Principle 1 Expert

MSC establishes a rigorous set of requirements for fishery assessment teams. ASI evaluated the qualifications of the Principle 1 expert, Mr. Michael Keatinge, who was nominated and then confirmed by the CB for assessment of the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery.

The qualifications for Principle 1 experts laid out in Annex CM of MSC CR Version 1.3 are as follows:

Fishery Team (collectively)	Qualifications	Competencies	Verification Mechanisms
1. Fish stock assessment	Five years or more experience applying relevant stock assessment techniques being used by the fishery under assessment OR Primary authorship of two peer reviewed stock assessments of a type used by the fishery under assessment	Ability to undertake a stock assessment using stock assessment techniques relevant to the fishery	· CV with full publication list · Employer's reference letter · CAB witness audits

2. Fish stock biology / ecology	Five years or more experience working with the biology and population dynamics of the target or species with similar biology	Demonstrate knowledge of, and ability to interpret, scientific information relating to the biological processes of the target species, or species with similar population dynamics	· CV with full publication list · Employer's reference letter · CAB witness audits

Based on a review of Mr. Keatinge's CV as well as additional information provided by FCI, ASI concludes that Mr. Keatinge fulfills the requirements for Principle 1 experts set out in Annex CM of the MSC CR version 1.3. Specifically, he has five years or more experience applying relevant stock assessment techniques being used by the fishery under assessment AND five years or more experience working with the biology and population dynamics of the target or species with similar biology. ASI concludes that Mr Keatinge's 17 years with the Albacore stock assessment group of ICCAT including five years as chairman, in addition to his 10 years of work reviewing the stock of interest to this assessment for the primary advisory committee to the European Commission satisfies the requirement of 'Five years or more experience applying relevant stock assessment techniques being used by the fishery under assessment'.

3.2 Process for Appointing Fishery Experts

In terms of the process followed by the CB, ASI reviewed each of the steps associated with nomination and confirmation of fishery experts to the proposed assessment team for the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery. ASI found that FCI complied with all applicable MSC requirements. That is, the CB announced the proposed fishery experts on the MSC website, allowed for stakeholder input, and confirmed the final selection of fishery experts at the end of the process as stipulated in MSC CR Version 1.3.

Mr. Burton became a registered stakeholder for this assessment and made his initial complaint to FCI after the assessment team nomination announcement. FCI responded to his concerns in a timely and professional manner before confirming the assessment team after the 30-day stakeholder comment period. From a procedural point of view, ASI concludes that the CB complied with MSC requirements.

4 Conclusion

ASI's decision is that the complaint from John Burton of IPNLF regarding the qualifications of the Principle 1 expert for the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery is not justified in this case.

5 References

ISO/IEC Guide 65:1996 General requirements for bodies operating product certification systems.

IAF GD 6:2006 IAF Guidance on the of ISO/IEC Guide 65:1996 General requirements for bodies operating product certification systems Issue 2.

ISO/IEC 17065:2012(E) Conformity assessment — Requirements for bodies certifying products, processes and services.

ISO 19011:2002(E) Guidelines for quality and/or environmental management systems auditing.

MSC Certification Requirements, version 1.3, Marine Stewardship Council, 14 January 2013.

Guidance to the MSC Certification Requirements, version 1.3, 14 January 2013.

ASI Complaints Procedure, ASI-PRO-20-104-Complaints_v3.0, approved 11 August 2010.

8 Appendices

Appendix 1. Mr. Michael Keatinge's CV (FCI: Confirmation of Team Membership)

Appendix 2. Correspondence between Mr. Burton and FCI

Appendix 3. Letter from Mr. Keatinge to Antonio Hervas, 3 March 2013

Appendix 4. Standing Committee on Research and Statistics, Biennial Report 1998-1999 (ICCAT)

Appendix 5. Standing Committee on Research and Statistics, Biennial Report 2000-2001 (ICCAT)

Appendix 6. Standing Committee on Research and Statistics, Report 2001 (ICCAT)

Appendix 7. Standing Committee on Research and Statistics, Report 2002 (ICCAT)

Appendix 8. Standing Committee on Research and Statistics, Biennial Report 2003 (ICCAT)

Appendix 9. Peer Review Report of the 2003 meeting of the ICCAT Albacore Species Group

From: ASI
Sent: 26 April 2013 22:05
To: John Burton (IPNLF)
Cc: FCI Fisheries
Subject: Complaint - Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

Dear Mr. Burton,

After reviewing the evidence presented in this case, ASI has found the complaint submitted on 1 April regarding the qualifications of the Principle 1 expert for the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery not to be justified. Please see the attached report for a summary of ASI's decision. If you have any questions regarding this outcome I would be happy to discuss them with you.

Best regards,

ASI Lead Assessor – Fisheries
ASI - Accreditation Services International GmbH

From: John Burton (IPNLF)
Sent: 28 April 2013 19:56
To: ASI
Cc: FCI Fisheries
Subject: RE: Complaint - Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

Dear ASI,

We are both surprised and disappointed at the conclusions in regard to our complaint. We continue to insist that Mr Keatinge does not meet MSC requirements for a P1 expert. In the past, our companies have supported the MSC process to the extent of co-financing individual assessments and we find the acceptance of the CABs approach to raise doubts about the integrity and robustness of the MSC approach.

You disagree with our complaint. However, you found the need to refer back to the CAB for additional information (your previous email). What additional evidence did the CAB provide to persuade you that our complaint had no merit?

We have found no proof whatsoever that Mr Keatinge has five years or more experience applying relevant stock assessment techniques being used by the fishery under assessment and there is no indication that he has the ability to undertake a stock assessment using stock assessment techniques relevant to the fishery. Despite exhaustive research we have failed to identify any scientific paper authored by Mr Keatinge on albacore. We did find http://www.iccat.es/documents/cvsp/cv056_2004/no_4/CV056041223.pdf that deals with the 2003 ICCAT ALBACORE STOCK ASSESSMENT SESSION (*Madrid, Spain, 15-20 September 2003*) where it is clear that Mr Keatinge was chair of the session; however the referenced documents including the model used for the assessment (MULTIFAN) do not include his name. Further the actual paper presented on the MULTIFAN model (Garcia and others http://www.iccat.int/Documents/CVSP/CV056_2004/no_4/CV056041391.pdf) does not reference any work by Mr Keatinge.

In his CV, Mr Keatinge refers to the assessment he conducted in 2004 on albacore still forming the basis of the advice for management of that stock. We are unable to trace that assessment. Accordingly, we consider that the simple riposte to our complaint is for the CAB to provide stakeholders with a copy of the relevant report. We do not consider Chairmanship of a meeting to prove authorship.

In our opinion, the credibility of any assessment on a tuna fishery that moves forward with Mr Keatinge as P1 expert must be in doubt. MSC requirements will have been overlooked and an EU fishery in

distant waters will be audited by someone who is directly associated with the STECF which is an important integral part of the EU process. Credibility that has already been stretched by the assessment timeline http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/Indian-ocean/echebastar_indian_ocean_purse_seine_skipjack_yellowfin_and_bigeye_tuna/assessment-downloads-1/20130122_TLine_TUN393.pdf) that schedules "Certificate Awarded" for January 2014, and a previous response by the CAB that indicates that Spain is considered as part of the fishery area.

We will continue to maintain strong vigilance of this assessment.

We look forward to your further comments

Kind regards

John

John Burton

Trustee

IPNLF
INTERNATIONAL POLE & LINE FOUNDATION

Proposed Peer Reviewers

John Burton, IPNLF

Sent: Tue 12/12/2013 15.20
To: John Burton, IPNLF
From: Fisheries Department, FCI
Subject: Response to Peer Reviewer Nominations - EIOtuna 12 12 13

Thank you for your comments received on the 22nd November regarding the proposed Peer Reviewers for the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery.

You highlighted a possible conflict of interest with one of our nominated Peer Reviewers and a member of the assessment team. We have reviewed this situation and would concur with your findings and will be looking to appoint an alternative third Peer Reviewer for this fishery.

However FCI disagree with your comments relating to Alain Fonteneau. It is true that he was participating in scientific meetings with IOTC its scientific committees & WG's but simply as an EU Scientist. He has confirmed that he was never employed by IOTC directly or indirectly and can verify that he is totally independent of the IOTC.

Our new Peer Reviewer nomination will be announced in due course.

Regards

Carol Leiper, Fisheries Scheme Administrator, FCI

Intent to Review Fishery Information

John Burton, IPNLF

Sent: Thurs 04/12/2014 12.21

To: John Burton (IPNLF)
From: FCI Fisheries Department

Subject: FCI to JB – Response to comments for Intent to Review Fishery Information – EIOTuna – 04 12 14

Dear Mr Burton

Please see below the assessment team's response to the information you submitted during the 'Intent to Review Information' consultation period for the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery.

Please note that this will be included in the Public Comment Draft Report and published on the MSC website for consultation in due course.

FCI Response: the assessment team have considered the report commissioned by IPNLF and sent to in by IPNLF on foot of the Intent to Review phase of the assessment. Having read the submission and given it due consideration, the following points are made by way of response:

1) The IPNLF report considers the interactions between tuna fisheries and cetaceans (whales and dolphins) in the Western and central Indian Ocean.

2) In the context of EU tuna purse seine fisheries, the IPNLF report points to evidence of interaction between purse seine fisheries and baleen whales and dolphin species in freeschool tuna fisheries where sets may be made on or in association with whales and or dolphins

3) The report suggests that a minimum of 14 whale mortalities may occur annually in freeschool tuna fisheries in the IO

4) The report suggests that additional numbers of whales may be impacted through unrecorded post capture mortality associated with escaping from gears

5) The report notes suggests that there is greater association between dolphins and tuna schools in the IO than is widely believed to be the case and that greater levels of interaction and impact on dolphin populations is likely or possible. Evidence appears to be largely anecdotal in this regard and does not concur with much of the evidence provided to the team in relation to this issue previously.

6) The IPNLF report considers freeschool tuna to be those tunas that are not captured using FADs but which may still be associated with whales and dolphins and floating objects. This interpretation of freeschooling tuna differs from the interpretation used in the UoC's under assessment.

7) The present assessment report relates only to UoC's based on purse seine sets made on freeschools of SKJ, YFT and BET. Freeschool tuna in the context of the assessment is considered only to relate to those schools that at time of capture are not associated with any natural or artificial floating objects, or seamounts and/or oceanic megafauna including whales and or dolphins. The IPNLF report makes no significant findings in relation to impacts on ETP species of purse seine sets that are made in on freeschools that are not associated with cetaceans or megafauna

8) The assessment team have fully considered the role of the freeschool fishery in terms of impacts on cetceans. The assessment is based on a variety of data including many of the sources referred to in the IPNLF report, but also data from Echebaster group going back over several years in relation to type of sets. Detailed consideration of information and data in relation to whale and dolphin interaction was made during the assessment and scoring of the UoC's being reported on. The data do not indicate that the freeschool fishery interacts significantly with either dolphin or whale species in the Indian Ocean.

9) Despite the foregoing, the assessment team have imposed a requirement on the fishery to carry out monitoring and reporting of all interactions of the fishery with ETP species (including cetaceans) (Condition 8). The aim is provide greater and more specific data in relation the fleets operations and levels of interaction with cetaceans as well as to allow for greater monitoring of levels of risk to cetacean species.

10) The assessment team appreciate that this raises a significant issue in relation to traceability and the verifiability that catches landed as MSC eligible product were captured in freeschool sets. However this is an issue for the fishery to resolve prior to any tuna being labelled as MSC product

or being allowed to enter into Chain of Custody and is not an issue that should prevent certification. This has been clarified with MSC.

Kind regards

FCI Fisheries Department

Appendix 3.1 Amendments made to the PCDR following stakeholder consultation

Greenpeace - Cat Dorey

From: Cat Dorey [mailto:cat.dorey@greenpeace.org]
Sent: 23 December 2014 09:22
To: Rupert Howes; melissa.appel@msc.org; FCI Fisheries
Cc: Oliver Knowles; Sebastian Losada

Subject: Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna fishery.

Dear Rupert and FCI

Please find attached our letter regarding Greenpeace's opposition to the recommendation by Food Certification International (FCI) to certify the Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna fishery.

As are team is much reduced due to the holiday period, we will be unable to make a more detailed submission at this time.

Sincerely

Dr Cat Dorey

--

Dr Cat Dorey

*International **Co-ordinator – Sustainable Seafood Project*
Greenpeace
Level 2, 33 Mountain St, Ultimo
Sydney, NSW 2007, Australia.
E: cat.dorey@greenpeace.org
P: +61 (0) 2 9263 0359
M1: +61 (0) 425 368 323 (in Australia)
M2: +61 (0) 466 924 683 (when travelling in Europe, US)
Skype: catdorey

From: FCI Fisheries
Sent: 23 December 2014 13:23
To: 'Cat Dorey'; Rupert Howes; melissa.appel@msc.org; FCI Fisheries
Cc: Oliver Knowles; Sebastian Losada
Subject: FCI to Greenpeace - Acknowledgement of PCDR comments - EIOTuna - 23 12 14

Dear Dr Dorey

This is to acknowledge receipt of your comments during the consultation period for the Public Comment Draft Report.

Your comments will be passed to the assessment team for consideration and they will respond following the conclusion of the consultation period.

Kind regards

Lesley Hamilton
Scheme Administrator
Food Certification International Ltd

GREENPEACE Greenpeace Australia Pacific t +61 2 9281 6100 greenpeace.au@greenpeace.org greenpeace.org.au
Level 2, 33 Mountain St, Ultimo NSW 2007 Post GPO Box 2622, Sydney NSW 2001 ABN 61 002 643 852

23 December 2014

Rupert Howes

CEO, Marine Stewardship Council

and Food Certification International

(by email)

Dear Rupert

It was with great dismay that, while attending the Scientific Committee meeting for the Indian Ocean Tuna Commission in the Seychelles last week (SC17), we received notification of the recommendation by Food Certification International (FCI) to certify the Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna fishery as "sustainable" in the Marine Stewardship Council (MSC) program.

Due to the release of the Public Report and the consultation period falling in the Christmas and New Year period, our team is significantly reduced so we are unable to make a detailed submission on behalf of Greenpeace. Please accept this letter as an indication of our opposition to the certification of this fishery.

Greenpeace has been working on seafood sustainability for over 10 years, with a focus on driving changes in the sourcing policies of major global retailers and seafood brand owners to provide market incentives that will in turn drive fisheries improvement. Greenpeace has been an Official Observer for many years at the International Commission for the Conservation of Atlantic Tunas (ICCAT) and the Western and Central Pacific Fisheries Commission, (WCPFC), and more recently at the Indian Ocean Tuna Commission (IOTC).

The certification of a tuna purse seine fishery, in the most poorly managed tuna RFMO with the highest rate of use of the highly problematic fish aggregating devices (FADs) will be of great concern to all those who are currently working to improve tuna and billfish fisheries. Unlike the situation in the WCPFC where there is at least a 4-month FAD ban in place, and only about 30% of sets are on FADs, in the IOTC as many as 90% of sets are on FADs (80% of sets by the Echebastar fleet) and there are no limits on FAD use.

The vast list of issues discussed by scientists at the SC17, and clearly laid out in the meeting report, make it very clear that at this time no tuna fisheries in the Indian Ocean can be currently considered as sustainable or well-managed because of the overall failure of the management regime (although to be clear, there are examples of fisheries that are working hard to deliver sustainable tuna from the Indian Ocean). Here we highlight the key issues raised by the SC17.

Overcapacity

The IOTC, like all tuna fisheries, already has a massive problem with overcapacity, and the fleets continue to grow. For example, this year, India reported the development of new coastal longline/trolling fishery targeting yellowfin and skipjack tuna from around 2011, and seven new purse seine vessels from Mauritius commenced fishing in 2014. Just last week, the French fishing company, Sapmer, announced the delivery of a new purse seiner, to be flagged in the Seychelles, with another sister vessel due to be delivered in early 2015.

This is not a problem that is going away. At SC16 last year, we heard that if the national fleet development plans are completed in the proposed timeline, and countries already fishing in the area keep their current levels of capacity, then "the fleets fishing for tuna and tuna-like species in the Indian Ocean by the year 2020 will be 251% over the baseline capacity from 2006, obviously an untenable position for stocks of tuna and tuna-like species in the area."

IOTC tuna stocks cannot be considered 'healthy'

The poor availability and quality of data for stock assessments in this region creates considerable uncertainty in stock assessments. Importantly, the SC17 discussed the fact that the stock assessment for skipjack is "overly optimistic" and that indicators such as a decrease in skipjack tuna catch-per-set rate and a decline in catch-per-unit-effort (CPUE) for free school sets point to possible problems in this fishery.

The biomass levels and fishing mortality rates for yellowfin and bigeye are only relatively healthy with regard to MSY levels (which should be limit, not target, reference points), due to the fact that Somalian pirates chased tuna vessels out of their key fishing grounds in 2008–2011. Some fleets shifted to targeting albacore in the south, while other moved to other oceans. However, the SC17 reported that both longline and purse seine vessels from some fleets have moved back into the western Indian Ocean in 2012 and 2013, and that the fishing patterns in 2013 were similar to the pre-piracy period. The next round of stock assessments is likely to show a return to the pre-piracy trends of increasing effort and declining biomass. It will be interesting to see how the MSC can justify piracy as a model for sustainable fisheries management.

FAD use is out of control

FAD use continues to increase and is confounding the ability of scientists to produce good stock assessments. The SC17 noted that:

"the number of drifting FADs deployed by purse seine vessels has dramatically increased over the past 10 years which may reach around 10,000 monitored in 2013, for the EU and Seychelles purse seine fleets only. This figure does not include the FADs deployed by purse seine vessels of other fleets, such as Rep. of Korea (4 vessels), Sri Lanka (8 vessels) and Mauritius (6 vessels which entered the fleet in 2014). Efficient strategies have been developed to fish on drifting FADs (e.g. electronic buoys to track the FADs, some of these buoys being equipped with echo-sounders for acoustic estimation of biomass around it, the use of support vessels for the monitoring and technical maintenance of FADs and buoys). The use of FADs has increased the fishing efficiency of the fleets using FADs; however, the scientists are still unable to estimate with accuracy the magnitude of this increase, and the impact this has on the distribution and abundance of tuna and CPUE standardisation."

Moreover, some worrying trends have appeared in the behaviour of tuna, especially skipjack, that are now essentially caught on FADs as free schools have become very rare and with their average size getting smaller in the recent years.

There is little data available to assess bycatch and ecosystem impacts

SC continues to highlight the absence of data to establish the ecosystem impacts of the fishery, particularly with regard to shark bycatch. The SC17 notes that: "information on retained catches and discards of sharks contained in the IOTC database remains very incomplete for most fleets despite their mandatory reporting status, and that catch-and-effort as well as size data are essential to assess the status of shark stocks."

Very few members have even developed National Plans of Action (NPOAs) for sharks (12/35) and seabirds (6/35), or even carried out assessments to ascertain if the development of a Plan is warranted. Similarly, few members have implemented of the FAO guidelines to reduce marine turtle mortality in fishing operations (6/35).

While the Echebastar fleet claims to be using the so-called eco- FADs to reduce the risk of entanglement of sharks and turtles beneath the FADs, this design does not reduce the impact the rate of bycatch in the purse seine nets, and nor does it prevent these FADs from being entangled on, or damaging, coral reefs. ,

Basic management practices are not in place

The IOTC has not yet agreed the basic elements of a good fisheries management – limit reference points (LRPs), target reference points (TRPs), and the harvest control rules that define in advance what actions must be taken to ensure that there is a very low risk that the fishery will exceed the LRPs.

The SC17 does not even support the current set of agreed interim LRPs (in Resolution 13/10). The SC noted that the LRPs are not consistent with FAO and UNFSA guidelines, as in those agreements the fishing mortality rate which generates MSY (FMSY) is considered as the LRP, not the TRP. The SC also noted that currently MSY-based reference points cannot be robustly estimated for IOTC stocks,

and has recommended that the IOTC follows the WCPFC in using depletion-based biomass LRP of 20% of unfished levels (BLIM = 0.2B0) and the corresponding fishing mortality LRP (FB20%).

If the experience of the WCPFC in agreeing management plans for tuna is anything to go by, the review of the possible reference points and harvest control rules by the SC, their agreement by the Commission, their application to tuna fisheries, and the evidence of their suitability through recovery of tuna stocks to precautionary and eco-system based levels, is many, many years away.

Certifying this fishery as “sustainable” is the equivalent of a doctor diagnosing a patient with cancer, then declaring them healthy before they have even begun treatment, let alone demonstrated a response to treatment, or any sign of recovery.

If this fishery is certified, it will be a major blow to global tuna fisheries conservation efforts, and will undermine the whole premise of driving change through market forces. It will also be the final blow to the credibility of the MSC.

We hope you reconsider this decision.

Sincerely

Dr Cat Dorey

Technical & Science Advisor – Tuna Project

Greenpeace

Mr Oliver Knowles

Team Leader – Tuna Project

Greenpeace

FCI Response to Greenpeace

The FCI assessment team offers the following response to the key concerns noted in the letter submitted by Dr. Cat Dorey and Mr. Oliver Knowles of Greenpeace.

Overcapacity

The IOTC was established at the 105th Session of the Council of the Food and Agriculture Organization of the United Nations (FAO) in 1993. As such the IOTC Members can make decisions concerning the management of tuna and tuna-like resources and their associated environment binding on all Members and Cooperating non-Contracting Parties.

And while the agreement was signed in 1993 it did not enter into force until March 27th 1996 on the accession of the tenth IOTC Contracting Party. This latter point is important for when, at the 6th session of the IOTC in 2001, the first resolution setting out management measures designed to limit fishing effort was introduced, it was a mere 5 years later. Resolution 01/04 sought to limit the fishing effort of vessels fishing bigeye tuna, and requested non-Members of IOTC to reduce their fishing effort in 2002 in relation to 1999 levels. It also provided for a review, at the 2002 Session, of the measures taken by non-Members to implement these reductions. Other resolutions followed. At the 8th session of the IOTC in 2003, resolution 03/01 was introduced. Once again this was concerned with limiting the fishing capacity but this time of all contracting parties and cooperating non-contracting parties alike. In its introduction, resolution 03/01 noted the recommendation from the Scientific Committee “that a reduction in catches of bigeye tuna from all gears should be implemented as soon as possible; that the stock of yellowfin tuna is being exploited close to, or possibly above MSY; and that the level of fishing effort of swordfish should not be increased”. This resoluiton also cited the FAO International Plan of Action for the Management of the Fishing Capacity (IPOA) which provides that "States and Regional Fisheries Organisations confronted with an overcapacity problem, where capacity is undermining achievement of long-term sustainability outcomes, should endeavour initially to limit at present level and progressively reduce the fishing capacity applied to affected fisheries". It is thus very clear that resolution 03/01, when

introduced, was intended as a tool to control harvest rates (i.e. fishing effort). In that sense, therefore, it must be considered a tool to implement a harvest control rule.

The principle measure introduced in the 2003 resolution was a limit, applicable in 2004, 2005 and 2006, on the number of fishing vessels larger than 24 meters length overall. This was based on the number of such vessels registered in 2003 as a reference year. It applied to both contracting and cooperating non-contracting parties with more than 50 vessels on the 2003 IOTC Record of Vessels. It also ensured that the limitation on the number of vessels was commensurate with the corresponding overall tonnage expressed in both GRT (Gross Registered Tonnage) or GT (Gross Tonnage) and specified that, where vessels are replaced, the overall tonnage shall not be exceeded. In this resolution the IOTC also sought to take note of the interests of developing coastal States, in particular 'small island' developing States and territories whose economies depend largely on fisheries. Special provision was made for such contracting and cooperating non-contracting parties which had the objective of developing their fleets above the authorisations foreseen. These were required to draw up fleet development plans in accordance with the provisions of Resolution 02/05 and to submit these plans to the IOTC for information. The FDPs defined, inter alia, the type, size and origin of the vessels and the programming of their introduction into the fisheries. …cont
Three years later, in 2006, at the 10th session of the IOTC, resolution 06/05 extended the reach of the 2003 resolution to vessels less than 24 metres if they fished outside their flag state EEZ. Specifically in the years 2007, 2008 and 2009, both contracting and cooperating non-contracting parties were now required to limit (by gear type) the number of their vessels of 24 m overall length and over, and under 24 metres if they fished for tropical tunas in the IOTC Area outside their EEZ, to the number of their vessels notified to IOTC for 2006 in accordance with IOTC Resolution 05/04. The link with capacity in GRT (Gross Registered Tonnage) or in GT (Gross Tonnage) was maintained as were the special provisions for contracting parties which had the objective of developing their fleets above the authorisations foreseen; that is the Commission took note of the interests of the developing coastal States, in particular 'small island' developing States and territories whose economies depend largely on fisheries.

Three years later, in 2009, resolution 06/05 (which only applied until 2009) was duly superseded by resolution 09/02. This new resolution applied to the years 2010 and 2011. It also introduced two new concepts. The first of these required that, within the period of application of the Resolution (2009 and 2010), CPCs could only change the number of their vessels, by gear type, provided that they could either demonstrate to the Commission (under the advice of the Scientific Committee) that the change in the number of vessels, by gear type, did not lead to an increase of fishing effort (E) on the fish stocks involved, or, that they were directly limiting catches using individual transferable quotas under a comprehensive national management plan which has been provided to the Commission. There is therefore now, for the first time, a link to F (from F = qE). The second new provision introduced by resolution 06/05 required CPCs to ensure that, where there was a proposed transfer of capacity to their fleet, the vessels to be transferred had to be on either the IOTC Record of Vessels or on the Record of Vessels of another tuna Regional Fisheries Management Organizations. Specifically, no vessels on the List of IUU Vessels of any Regional Fisheries Management Organization could be transferred. Finally, in 2012, resolution 09/02 (which only applied in 2010 and 2011) was itself superseded by resolution 12/11, this time applicable during the years 2012 and 2013. This kept all the key terms of the 2009 resolution (09/02) and critically retained the 2006 baseline for tropical tunas.

It specifies (paragraph 3) that within the period of application of the Resolution, CPCs may only change the number of their vessels, by gear type, provided that they can either demonstrate to the Commission, under the advice of the IOTC Scientific Committee that the change in the number of vessels, by gear type, does not lead to an increase of fishing effort on the fish stocks involved or where they are directly limiting catches using individual transferable quotas under a comprehensive national management plan which has been provided to the Commission. CPCs are further required to ensure that where there is a proposed transfer of capacity to their fleet that the vessels to be transferred are on the IOTC Record of Vessels or on the Record of Vessels of other tuna Regional Fisheries Management Organisations. No vessels on the List of IUU Vessels of any Regional Fisheries Management Organisation may be transferred. Specific provision was also made for the implementation of fleet development plans. For CPCs which fail to introduce vessels in accordance with their Fleet Development Plans, the IOTC Compliance Committee and the Commission will give annual consideration to the related problems. In addition the IOTC Compliance Committee is required to verify, at any IOTC Plenary Session, the compliance of CPCs with the provisions of this Resolution, including the implementation, according to the notified programming, of the Fleet Development Plans.

(In relation to the latter, the Commission is also required to give due consideration to the interests of the developing coastal States, in particular small islands developing States and territories within the IOTC area of competence).

Finally, the limitation established by resolution 12/11 was to be applicable during the years 2012 and 2013. The IOTC undertook to review its implementation at the 2014 IOTC Session. This review (see section 3.3.4.2) was prepared by the IOTC Secretariat, and presented on 26th April 2014 as document IOTC-2014-CoC11-05 Rev1[E] Report on the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating Non-Contracting Parties. The report summarised the information available to the Secretariat (in accordance with IOTC Resolution 12/11) to assist CPCs in assessing compliance with the limitation on fishing capacity, in particular with the provisions of paragraph 1 of the Resolution. Specifically it included tables that indicate the reference limits on fishing capacity based on the tonnage and number of vessels declared as active in 2006 for tropical tunas.

The report concluded "In relation to tropical tunas, the results indicate that the active capacity in 2013 (516,233 tons) has decreased relative to the baseline capacity of 2006 (576,163 tons), and it was just over half the reference limit capacity of 993,662 tons, that was expected for 2013. The lower than expected value is the results of reductions in capacity of most fleets, and also the failure of the majority of CPCs with a fleet development plan, to implement the plan".

Recalling that Paragraph 6 of resolution 12/11 allowed other CPCs develop their fleets in compliance with a properly introduced fleet development plan; this was IOTC taking note of the interests of the developing coastal States, in particular 'Small Island' developing States and territories whose economies depend largely on fisheries. However these plans were only valid if introduced to the IOTC by 31 December 2009 and were required to include inter alia, the type, size, gear and origin of the vessels intended as well as the programming (precise calendar for the forthcoming 10 years) of their introduction into the fisheries. As a consequence it is possible to calculate the total capacity increase envisaged in these fleet development plans: this amounted to 418,749 tonnes. As a consequence, the Reference Capacity for 2013 was no longer 576,163 tonnes but, instead, 993,662; or a total increase in the reference capacity (relative to the 2006 baseline) of some 172%. Against a backdrop of an increasing trend in F and a declining trend in B for the 3 main tropical species, yellowfin, skipjack and bigeye, such an increase seems incompatible with the principles of fisheries management. That being said, it is important to recall that 1) not alone did the active capacity not increase to the new reference capacity of 993,662 tonnes, on the contrary it declined by 10% relative to 2006 to 516,233 tonnes, and 2) further, had the capacity increased during the interval and had, as a consequence, the fishing mortality increased in any of the year after 2006 such that Fyear>2006 > FMSY then under the terms of resolution 13/10 the IOTC Scientific Committee were required to apply the interim reference points in the provision of advice on the status of stocks as well as when making recommendations for management measures. In respect to the latter the IOTC Scientific Committee was required to take account of the specific objectives, namely that it aimed at ending overfishing with a high probability in as short a period as possible. In other words, had the increase in capacity envisaged in the fleet development plans come about and had this resulted in overfishing then the IOTC Scientific Committee were required to make recommendations aimed at ending overfishing with a high probability. Recalling that IOTC-2014-CoC11-05 Rev1[E] Report on the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating Non-Contracting Parties concluded "In relation to tropical tunas, the results indicate that the active capacity in 2013 (516,233 tons) has decreased relative to the baseline capacity of 2006 (576,163 tons), and it was just over half the reference limit capacity of 993,662 tons, that was expected for 2013. Further recalling that the latest assessment of the status of IOTC tropical stocks. And noting that in each case the diagram shows the temporal trend in the ratios Bcurrent /BMSY (x-axis) and Fcurrent /FMSY (y-axis). Purple circles represent the annual median values over time. Dots indicate uncertainty in the current status estimated from models that make different assumptions.

The Report of the Seventeenth Session of the IOTC Scientific Committee, Seychelles, 8–12 December 2014, [IOTC–2014–SC17–R[E], concluded:

Bigeye Tuna: "on the weight-of-evidence available in 2014, the bigeye tuna stock is determined to be not overfished and is not subject to overfishing."

Skipjack: "on the weight-of-evidence available in 2014, the skipjack tuna stock is determined to be not overfished and is not subject to overfishing."

Yellowfin: "on the weight-of-evidence available in 2014, the yellowfin tuna stock is determined to be not overfished and not subject to overfishing."

IOTC tuna stocks cannot be considered 'healthy':

FCI Response: This statement is refuted in its entirety in the latest report of the IOTC Scientific Committee.

The Report of the Seventeenth Session of the IOTC Scientific Committee, Seychelles, 8–12 December 2014, [IOTC–2014–SC17–R[E], concluded:

Bigeye Tuna: No new stock assessment was carried out for bigeye tuna in 2014, thus, stock status is determined on the basis of the 2013 assessment and other indicators presented in 2014. The 2013 stock assessment model results did not differ substantively from the previous (2010 and 2011) assessments; however, the final overall estimates of stock status differ somewhat due to the revision of the catch history and updated standardised CPUE indices. All the runs (except 2 extremes) carried out in 2013 indicate the stock is above a biomass level that would produce MSY in the long term (i.e. SB2012/SBMSY > 1) and in all runs that current fishing mortality is below the MSY-based reference level (i.e. F2012/FMSY < 1). The median value of MSY from the model runs investigated was 132,000 t with a range between 98,000 and 207,000 t. Current spawning stock biomass was estimated to be 40% of the unfished levels. Catches in 2013 (≈109,000 t) remain lower than the estimated MSY values from the 2013 stock assessments. The average catch over the previous five years (2009–13; ≈106,000 t) also remains below the estimated MSY. In 2012 catch levels of bigeye tuna increased markedly (≈26% over values in 2011), but have declined in 2013 by 9% from 2012 levels. **Thus, on the weight-of-evidence available in 2014, the bigeye tuna stock is determined to be not overfished and is not subject to overfishing.**

Skipjack The 2014 stock assessment model results did not differ substantively from the previous (2012 and 2011) assessments; however, the final overall estimates of stock status differ somewhat due to the revision of the input parameters and updated standardised CPUE indices. All the runs carried out in 2014 indicate the stock is above a biomass level that would produce MSY in the long term (i.e. SB2013/SBMSY > 1) and in all runs that the current proxy for fishing mortality is below the MSY-based reference level (i.e. Ccurrent/CMSY < 1) (Table 1 and Fig. 1). The median value of MSY from the model runs investigated was 684,000 t with a range between 550,000 and 849,000 t. Current spawning stock biomass was estimated to be 57% of the unfished levels. Catches in 2014 (≈424,000 t) remain lower than the estimated MSY values from the 2014 stock assessments. The average catch over the previous five years (2009–13; ≈401,000 t) also remains below the estimated MSY. **Thus, on the weight-of-evidence available in 2014, the skipjack tuna stock is determined to be not overfished and is not subject to overfishing.**

Yellowfin: No new stock assessment was carried out for yellowfin tuna in 2014, thus, stock status is determined on the basis of the 2012 assessment and other indicators presented in 2014. The stock assessment model results from 2012 did not differ substantively from the previous (2011) assessments; however, the final overall estimates of stock status differ somewhat due to the refinement in the selection of the range of model options due to increased understanding of key biological parameters (primarily natural mortality). Two trajectories are presented that compare the Kobe plots obtained from the MFCL and ASPM assessments. While the MFCL assessment indicates that fishing mortality is below the limit and target reference points during the whole time series, the ASPM model run indicates that the target reference points may have been exceeded during the period of high catches in the mid 2000's (2003–2006). However, estimates of total and spawning stock biomass show a marked decrease from 2004 to 2009 in both cases, corresponding to the very high catches of 2003–2006. Recent reductions in effort and, hence, catches resulted in a slight improvement in stock status in 2010. Spawning stock biomass in 2010 was estimated to be 38% (31–38%) of the unfished levels. Total catch has continued to increase with 400,292 t and 402,084 t landed in 2012 and 2013, respectively, well in

excess of previous MSY estimates (≈17% above the MSY level of 344,000 t; in comparison to 327,453 t landed in 2011 and 299,713 t landed in 2010. Catches in 2010 (299,713) were within the lower range of MSY level and the last assessment indicated that catch of about the 2010 level were sustainable in the longer term. The previous assessment showed that the stock was unlikely to support substantially higher yields based on the estimated levels of recruitment from the last 15 years although higher yield would be expected if recruitment corresponds to the long term average. However, catch rates have improved in the purse seine fishery while remaining stable for the Japanese longline fleet. Therefore it is difficult to know whether the stock is moving towards a state of being subject to overfishing. **Thus, on the weight-of-evidence available in 2014, the yellowfin tuna stock is determined to be not overfished and not subject to overfishing**

FAD use is out of control:

The assessment team has noted in the report that FAD use accounts for a major portion of the tuna catch in the Indian Ocean, and that there are concerns with the ecosystem impacts of FAD use. However the team notes that the fishery addressed in this report uses only “free school sets” and does not apply to tuna captured with purse seine sets in association with FADs and/or seamounts, and/or oceanic megafauna including whales and or dolphins.

There is little data available to assess bycatch and ecosystem impacts: As noted in the team response to the previous concern, this assessment report addresses the “free school set” tuna purse seine fishery, not the FAD associated set fishery. The Greenpeace concern related to data available to assess bycatch and ecosystem impacts is directed to shark bycatch in the FAD associated fishery and to the habitat impacts of FADs on corals, etc. As described in the report, the team believes that the data available is adequate to assess bycatch and ecosystem impacts in the “free school” fishery, and that these impacts are minimal and acceptable.

Basic management practices are not in place:

Given that resolution 13/10 establish interim target (BMSY and FMSY) and limit (BLIM and FLIM) reference points, then resolution 12/01 may be taken to provide context for an overall harvest strategy including the intention that management responses ultimately be guided by HCRs once determined using MSE.

The overall effect, therefore, of resolutions 12/01 and 13/10 is to provide interim elements of the final harvest strategy that are clearly intended to ensure that the stocks are maintained around the target reference points (BMSY and FMSY).

In that sense then, the intention of resolutions 12/01 and 13/10 are consistent with appropriate management; they provide a framework that is well known from other fisheries where it has proven effective. There is no reason to believe that it would be any less effective here if strictly applied.

ISSF (International Seafood Sustainability Foundation) - Ana Justel

From: Ana Justel [mailto:ajustel@iss-foundation.org]
Sent: 14 January 2015 08:21
To: FCI Fisheries
Cc: Susan Jackson; Victor Restrepo

Subject: MSC announcement release of PCDR for Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

Dear Sirs/ Madams,

In reference to the above matter, enclosed please find ISSF's comments.

Please, do not hesitate to ask if you have any questions.

Kind regards,

Ana Justel
ISSF
Scientific and Administrative Assistant
ajustel@iss-foundation.org
www.iss-foundation.org

From: FCI Fisheries
Sent: 14 January 2015 12:16
To: 'Ana Justel'
Subject: FCI to ISSF - Acknowledgement of comments on PCDR - EIOtuna 14 01 15

Dear Ms Justel

FCI would like to acknowledge receipt of your comments on the Public Comment Draft Report for this fishery assessment and thank-you for your input.

Your comments have been passed to the assessment team for this fishery and are currently being considered in light of the points that you have raised.

We will come back to you on this as soon as we can.

Kind regards.

Fisheries Department

International Seafood Sustainability Foundation 805 15th Street NW, Suite 650, Washington, DC 20005 P: 703-226-8102
www.ISS-Foundation.org

Susan Jackson ISSF President 805 15th Street NW, Suite 650
Washington DC 20005 United States

Nick Pfeiffer
Food Certification International Ltd.
Findhorn House
Dochfour Business Centre
Dochgarroch
Inverness, IV3 8GY
Scotland, UK

January 14, 2015

SUBJECT: PCDR Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

Dear Mr. Pfeiffer:

The International Seafood Sustainability Foundation (ISSF) is a registered stakeholder in the MSC assessment of the Echebastar Indian Ocean Purse Seine skipjack, yellowfin and bigeye tuna fishery. We do not have specific comments about the scores in the Public Comment Draft Report that was posted in December 2014. However, we do have two concerns that we believe need to be addressed.

(1) The Harvest Method (UoC)

As one Reviewer noted (p. 284 of the PCDR), the original assessment requested by the Client was for six units of certification (the three target tuna species, caught in either free schools or associated with floating objects.) The PCDR is, however, limited to three UoCs, those pertaining to free school sets only.

ISSF is concerned that these three remaining UoCs prescribe an artificial fishery solely to meet minimum MSC standards without consideration of the ecological footprint of the fishery operation as a whole. With the exception of one or two months in the year, in order for a vessel-trip to be profitable, both FAD and free school sets must be made. ISSF is concerned that the risk of mixing catches from associated and unassociated sets on board might jeopardize the final product's traceability. In order for the fishery to achieve certification, it must be verified that the Chain of Custody is strong and starts at sea. Besides, the evaluation should encompass the impacts of the whole operating fishery on the stocks and ecosystem and not just those elements of the fishery that have been pre-selected to only include those aspects of the operating fishery that have minimal impact.

ISSF recognizes that the PNA Skipjack Free School Purse Seine Fishery, which suffers from the same artificial fishery definition, established a precedent since it received MSC certification. Therefore, the Echebastar fishery should also be eligible for certification by MSC, provided that its Chain of Custody certification is as strong as the PNA one.

(2) Relationship between Echebastar and ISSF

While it is true that Pesqueras Echebastar's vessels are listed on ISSF's Proactive Vessel Register (PVR), it is not correct to define Pesqueras Echebastar as a member of ISSF, as it is stated in the Client Action Plans of Conditions 2, 4 and 6 (PCDR p. 261, 263 and 265). We suggest the following wording: "Pesqueras Echebastar shares the ISSF opinion that the adoption of HCRs is a key aspect of modern fisheries management."
In addition, the text in pages 194 and 207 (last bullet points) suggests that there are ISSF observers. This is incorrect. The text should be revised to say "... carriage of observers from SFA."

Thank you for considering our position on this issue.

Sincerely,

Susan S. Jackson

President International Seafood Sustainability Foundation

FCI Response to ISSF

The FCI assessment team offers the following response to the key concerns noted in the letter submitted by Susan Jackson, President, International Seafood Sustainability Foundation.

(1) The Harvest Method (UoC): The ISSC comments accurately describe that evolution of the Echebastar Indian Ocean Purse seine Skipjack, Yellowfin and Bigeye Tuna Fishery assessment process. During the assessment process, it became clear to the assessment team and the fishery client, that separation of the units of certification into those that would potentially meet MSC standards at this time, and those that were more problematic was the best approach. At that point, the units of certification were separated into skipjack, yellowfin and bigeye tuna captured with "free school sets" of a purse seine and those species of tuna captured with purse seine sets associated with FADs, seamounts and marine mammals.

The assessment of tuna captured with sets other than "free school" still requires additional information and evidence gathering to take place before these additional units of certification (UoC) can progress further under MSC assessment.

As per MSC certification requirements the assessment of of the "free school" set tuna fishery was able to continue to scoring and the preparation of the PCDR report. This report addresses only the "free school" Esebastar tuna purse seine fishery.

This report duly notes the need for separation of "free school" and all other set tuna after capture, and traceability of the "free school" set tuna catch. Section 5 of the Assessment Report covering Traceability has been amended to clarify that free school caught tuna will not be eligible to enter MSC chains of custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels.

(2) Relationship between Echebastar and ISSF: The ISSC comments are noted and the suggested corrections have been made in the text of the assessment report.

PNA Tuna - Maurice Brownjohn

From: Maurice Brownjohn [mailto:maurice@pnatuna.com]
Sent: 11 December 2014 19:28
To: FCI Fisheries
Subject: Re: FCI to Stakeholders - Public Comment Draft Report published - Echebastar Indian Ocean Tuna Fishery - 06 12 14

Lesley thank you.

I am surprised that the stakeholder interview i had with the team is not apparently represented.

Maurice

From: FCI Fisheries
Sent: 19 December 2014 15:25
To: 'Maurice Brownjohn'
Subject: RE: FCI to Stakeholders - Public Comment Draft Report published - Echebastar Indian Ocean Tuna Fishery - 06 12 14

Dear Maurice

I will pass your comments to the assessment team.

Kind regards
Lesley Hamilton
Scheme Administrator
Food Certification International Ltd

FCI Response to Maurice Brownjohn

The FCI assessment team offers the following response to the comment noted in the e-mail submitted by Mr. Maurice Brownjohn.

The following is the transcript of the stakeholder meeting via Skype held with Mr. Brownjohn during the Seychelles site visit, Mr Brownjohn's input is highlighted in blue:

Dear Maurice

Here at last are the meeting notes. Could you please track in (shown in blue) any additional comments or points or information that you would like the team to be aware of.

Meeting Record – Maurice Brownjohn

Skype Conference

Attendees:

1. Maurice Brownjohn in the Marshall Islands
   In Seychelles
2. Martin Gill, FCI
3. Nick Pfeiffer – P2 7 Team Leader
4. Michael Keatinge – P1
5. Luis Ambrosio – P3
6. Colin Brannen - ASI

Date: 25.09.13

Time / Location: 08.30, Skype Conference - 4.30pm RMI time

1. Introduction round table
2. Standard introduction read by NPf
   - MB - encouraged by ASI presence
   - Day 2 of site visit, 1st or 2 site visits
   - How many stake holders registered? - In Seychelles visit couples vessels, Seychelles Fish Authority, IOTC, WWF, etc. and skype. Second visit will be in Madrid, Spanish authorities [EU contracting party to IOTC], additional client meetings

Main points noted

1. Clarified the ownership of the vessels plus the UoCs, then discussed the UoCs that were considered under the PNA assessment.
   - client group 6 vessels - 4 EU [ES], 2 Seychelles flag
   - 6 units of cert - be, yf, sk, and free school / fad
   - MB expressed concern over status of stocks on Kobe plot. - all stocks fine in IOTC advise Concern over level of science in IOTC. Target and bycatch for each species e.g. be. PNA split free school, anchored FADs, drifting fads, natural logs. 4 for each species.
2. Main concern is to ensure there is harmonisation and equivalence between the 2 assessments (PNA & Echebaster) e.g. take into account that the PNA fishery had 100% observer coverage, 100% VMS, mitigation strategies, transshipment procedures, 100% transshipment, catch retention, etc.
   - IPNLF had to prove validity of 100% coverage, 50 years science, mitigation strategies, FAD measures,
   - IPNLF - note IOTC has reference points, but note PNA building these, and has never been needed before.
   - IPNLF - PNA forced to harmonise with other assessments. Expect same in Echebastar.
   - IPNLF - note PNA had many stake holder objections, these appear absent in this case, perhaps reflecting commercial interests. IPNLF expect same issued addressed and equivalence.
3. IPNLF want assurance that this will occur and the assessment report will reflect how this harmonization of scoring has been achieved. - assured it will be.
   - PNA / Echebastar same gear, same species, same issues
   - IPNLF - EU FPA in region have no control or limit on effort, how do you propose to deal with this in regards to managing effort in a well-managed fishery? - Capacity control by EU by vessel numbers. - So no limit on effort?
   - IPNLF - CAB will take up with IOTC today "in absence of effort control, are IOTC science advisory satisfied that it sufficiently managed?"
   - CAB Somali pirates reduced capacity/effort 25%, - will effort return? - CAB will question IOTC concern over hcr, and political vs science advice.
   - Concern on EU significance as a dwfn in IOTC.
   - Our understanding MSC - FADs cannot be certified as a distortion of environment. We ran natural logs as natural, but failed on high bye catch, be, ETP etc. these issues do not exist with free school.
   - CAB view on environmental friendly fads? - No such thing, what is an environmental friendly fad? It minimizes ghost fishing but not bycatch issues. So the issue remains. Being bio degradable had no impact. Logs are biodegradable!
   - Free school spp and fad spp reflect speed they can swim.
4. Discussed concern over management of effort - confirmation that we understand this concern and will discuss today with IOTC scientific advisors.

5. Followed up with discussion around P2 issues and when scoring may take place. Request when come to scoring that the team considers PNA report and scoring outcomes
6. Habitat modified PI does not allow use of artificial fads, PNA only had natural logs assessed but these had issues with by-catch implications which meant that only free school UoCs could be certified. This is an issue that the team needs to give consideration to.
7. The % proportion of by-catch depends on the number of tuna caught but the amount of by-catch remains similar.
8. Mortality of vulnerable species does not change - it is the fact that FADs are used is the problem.
   - CAB will reducing ghost fishing significantly shark mortality? no - many fads use coconut fronds, etc logs etc don't have net, but mortality issues remain., CAB " IOTC 82,353 mt, NEI estimate 55,000mt silky shark - ghost fishing is not reason for difference, it is primarily it is the purse seine that kills bycatch ,
   - There is concern over data in EU fpa assessments. CAB OWT 388mt / 55,435mt also a concern. Question validity of statistics with IOTC.
9. Observer, MCS data needs scrutinised, also concerned with accuracy of data

Principle 3 - opinion in relation to overall tuna management in the Indian Ocean?

10. Does not have 100% observer coverage so unsure of validity of any data, is it sufficient to have confidence? Catch data (is there evidence or policy on high grading - EU caught doing this in Pacific. Trashing small fish distorts mortality.)
11. IUU fishing is an issue, is there evidence of transshipping in high seas, if so IUU is a concern. If in port what is level of coverage?
    - Note reference to Somali pirates being prime conservation measures, are there other cmm in place and what about history and validity of science in IOTC
12. Management Plans for EEZ's and High Seas? and compatibility
13. What is the impact of various subsidies and the effects on this fishery - this will be addressed specifically. What about funding for boats and boat building by EU, Spain, various regions etc.? - CAB this is now against EU Regulations art 26/27. EU will now assist in control, and surveillance but not building subsidy. EU rules now illegal to subsidize in Spain to builds or modernise fleets.
    - CAB UOC is not exclusively EU fleet, will research if Seychelles boats were subsidized.
    - Is there any policy on fad numbers, in PNA we found fads deployed increased and use of sonar buoys negated and benefit of fad closures
14. urge that similar rationale is taken when scoring the Indian Ocean fleet as taken with the PNA assessment, all gears and vessels identical, just different ocean
    - CAB using same assessment tree as PNA. note tree has changed, some significance.
15. Pre-assessment recommended not to proceed until certain P1 issues were addressed.
    - CAB - no obligation to follow pre assessment findings.
16. Traceability - CoC must start from the net. Observers on board, wells nominated and segregated for free schools, both on purse seiners and separated on carriers and factories - this applies to the transshipment element as well. Really no different to IATTC handling of dolphin interactions under ADICP programme. Kept segregated in factory, when reaches factory the species composition is worked out as final check and mass balance.
    - All this data was already collected by PNA observer programs. Species and mass balances through process. CoC starts at net, not discharge, otherwise no validity to coc if based on self-declarations which are worthless.
    - Will look to have further inputs to process.
    - Request written transcript from CAB.

Connectivity is very bad - ended up texting confirmation of our understanding of the need for harmonisation - 6th October in UK - if we want to follow up - MG contact.

Would they put their concerns in writing? Time seems to be an issue in terms of finding time to write this down therefore agreed that MG would circulate these notes to Maurice for him to add additional relevant comment and information – team agreed.

End

From: Wetjens Dimmlich [mailto:wdimmlich@wwf.panda.org]

Sent: 19 January 2015 15:45

To: FCI Fisheries

Cc: Daniel Suddaby

Subject: WWF Comments on Echebastar purse-seine fishery

Dear Sir/Madam,

Please find attached the MSC stakeholder input form and associated attachment presenting WWF's comments on the Public Comment Draft Report for the Echebastar purse-seine fishery.

WWF is an environmental organisation working on marine conservation and fishery improvement projects around the world. WWF openly promotes Marine Stewardship Council's (MSC) certified products and works to improve market access for those fisheries that are certified and to enable more fisheries to improve to a standard where certification is possible. WWF considers that the full application of the MSC's rigorous and robust standards and procedures are critical to ensuring the MSC maintains its leading position, as well as providing WWF the confidence to promote MSC certified products.

WWF has been, and continues to be fully supportive of fisheries which can demonstrate a commitment to improving the management of Indian Ocean tuna resources by the Indian Ocean Tuna Commission (IOTC).

WWF provide these comments in support of all producers, consumers, communities and industry stakeholders which place their trust in FCI and other certification bodies to apply the MSC Certification Requirements impartially and with full rigour in all their assessments.

Regards,

Dr Wetjens Dimmlich | Tuna Programme Manager - Indian Ocean

World Wide Fund For Nature (WWF) | Smart Fishing Initiative

From: Carol Leiper, Food Certification International Ltd

Sent: 20 January 2015 10:10

To: 'Wetjens Dimmlich'

Subject: FCI to WD - Acknowledgement of Comments on PCDR - EIOtuna 20 01 15

Dear Wetjens

FCI would like to acknowledge receipt of your comments on the Public Comment Draft Report for this fishery assessment and thank-you for your input.

Your comments have been passed to the assessment team for this fishery and are currently being considered in light of the points that you have raised.

We will come back to you on this as soon as we can.

If you do not wish to be kept informed of the progress of this fishery assessment, please contact FCI and we will remove your details from the stakeholder list.

Kind regards.

Fisheries Department

WWF – (World Wide Fund for Nature)

Stakeholder Input into an MSC Fishery Assessment

Echebastar Purse-seine yellowfin, bigeye and skipjack tuna

Comments submitted by World Wide Fund for Nature (WWF)

Summary:

WWF raises a number of critical issues relating to the proposed certification of the Echebastar purse seine yellowfin, bigeye and skipjack tuna fishery.

There is a lack of objective evidence provided by the assessment team to provide a convincing case that the tuna stocks are managed sustainably, in conformance with the MSC requirements. In fact the evidence to date indicate that the fishery lacks a harvest strategy as defined by the MSC, any harvest control rules as defined by the MSC, and, of greater concern, there is no evidence of a precautionary approach to management, in spite of projected declines of some stocks resulting from overcapacity and a demonstrated and repeated lack of management response to catch levels recommended by the IOTC Scientific Committee.

The most at-risk stock, yellowfin tuna, is believed to be currently in an relatively positive state due mainly to the effects of piracy in the Indian Ocean and to negative economic conditions during the years of the global financial crisis which slowed ambitious and potentially disastrous fleet development plans by many Indian Ocean states. This is hardly the basis on which to certify a fishery as “sustainable”. Although the members of the IOTC have taken positive steps in recent months, actively discussing and moving toward addressing some of the management shortfalls, until these are formally adopted through IOTC Resolution, this fishery cannot make claims of being sustainably managed.

In conclusion, the risk in certifying this fishery is not confined only to these tuna stocks. There is risk also to the people of the Indian Ocean coastal states who depend on these stocks for their livelihoods, there is risk to the credibility of the MSC programme itself and there is significant risk to all those whose commercial interests would be damaged by suspension of the certification should the IOTC fail to respond appropriately to any decline in stock status. It should be noted that IOTC stock assessment scientists consider this scenario likely for yellow fin tuna within the period of certification.

NB. Comments are not species-specific unless indicated.

Comments on P1:

RESPONSE: The response is provided in the following section at the end of these comments

PI 1.1.1 The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing

Scoring Issue	Assessment Team Rationale	Comment
SG60 It is likely that the stock is above the point where recruitment would be impaired.	No direct reference made to this issue by the team or rationale provided	No comment able to be made.
SG80 It is highly likely that the stock is above the point where recruitment would be impaired	No direct reference made to this issue by the team or rationale provided	No comment able to be made.
SG100 There is a high degree of certainty that the stock is above the point where recruitment would be impaired.	... Therefore, taking account of the uncertainty associated with the base case status estimates, there is a high degree of certainty (i.e. greater than 95%, as set out in MSC CR CB2.2.1.3) that the stock is above the point where recruitment would be impaired – the default value for this being around 50% of the BMSY level. This meets SG100.	● The comments below are for yellow fin ● The team make their conclusions on the current state of the stock based on results of assessment conducted in 2011. It is a very big assumption to claim 95% certainty in the current stock levels, several years hence, particularly in justification of a 100 score. (CB2.2.1.3 High degree of certainty means greater than or equal to the 95th percentile.) ● The Kobe plots referred to by the team indicate clear downward trajectory of biomass (up to 2010) toward an overfished state, with one plot suggesting biomass had fallen below B_{targ}, approaching B_{lim} before recovering (believed to be due to piracy excluding vessels from a key fishing area). This is not the biomass trajectory of a fishery where it could be said with 95% certainty that the stock IS above any specific point. Likely, or perhaps even highly likely, but not with a high degree of certainty. A maximum score of 80 would be justified.

		● From the Report of the 16th Scientific Committee we have these notes: ○ "it is difficult to know whether the stock is moving towards a state of being subject to overfishing." ○ "annual catches of yellowfin tuna should not exceed the lower range of MSY (300,000 t) in order to ensure that stock biomass levels could sustain catches at the MSY level in the long term. Catches have exceeded this level in 2011 and 2012" ○ "The current assessment indicates that catches of about the 2010 level are sustainable, at least in the short term" (Catches since 2010 have been in excess of 2010 levels and it is not known with any certainty what effect this is having on current spawning biomass.) ○ The report of the 16th Session of the Working Party on Tropical Tunas further notes that catches in 2013 also exceed the recommend catch by approximately 17%, also noting that recruitment estimated by MFCL is considerably lower than the whole time series average and catches below MSY would be needed to maintain stock levels. ○ "The problems identified in the catch data from some fisheries, and especially on the length frequencies in the catches of various fleets, **a very important source of information for stock assessments**. Length frequency data is almost unavailable for some fleets, while in other cases sample sizes are too low to reliably document changes in abundance and selectivity by age" ○ IOTC are still evaluating periods of recruitment to feed into assessment models, attempting to overcome data deficiencies. "The resulting estimates of MSY (380,000–450,000 t) are considerably higher than levels of catch sustained from the fishery and are considered to be overly optimistic. Similarly, the corresponding **estimates of stock status are considered to be highly uncertain or unreliable**." ● With lag of several years in assessments and reported increasing levels of fishing effort, there is no way to state with the required level of certainty the current situation. In the light of the number of

		years that have passed since the last full stock assessment, the poor quality of data available to stock assessment scientists, and the uncertainties inherent in the models being used based on the available data, we do not feel the assessment team has provided strong enough justification for a 100 score, a score that is earned only in the most exemplary fisheries. ● Finally we note that although the PI refers to the current status of the stock, all the CAB's rationale for their scores are based on projections forward from the last stock assessment, several years ago. We do not see how they can arguably claim to have knowledge, at greater than 95% confidence level, of the current status of the fishery based on their projections of old stock assessments of a heavily fished stock.
SG80 The stock is at or fluctuating around it target reference point	No direct reference made to this issue by the team or rationale provided	No comment able to be made.
SG100 There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its reference point, over recent years	The current estimate of SB2010/SBMSY = 1.24 [0.91– 1.40]. And while the ASPM model run indicates that the target reference points may have been exceeded during the period of high catches in the mid 2000's (2003–2006), the WPTT agreed that the MFCL assessment, which indicates that fishing mortality is below the limit and target reference points during the whole time series, represents the best view of the stock. Also there is a low risk of exceeding the SBMSY in the next 6 years if catches are maintained at 2010 (8.3 % risk that SB2020 < SBMSY). However the risk that F2020 > FMSY = 8.3).	● There is no evidence that the team has considered the biology of the species and the scale and intensity of both the fishery and management system and other relevant issues in determining relevant time periods over which to judge fluctuations. (MSC CR CB2.2.2). ● We do not feel that a generally unidirectional decline in stock abundance over many years, with a possible dip below B_{targ} and a return above B_{targ}, attributed by the IOTC Scientific Committee mainly to the exclusion of fishing vessels by piracy, rather than effective management of the stock is sufficient justification for a 100 score. ● The intent of this scoring issue is to demonstrate the sustainability of a stock through appropriate management practice over a relevant time period. The rationale provided by the assessment do not support this, in fact demonstrating a fishery in steady decline under increasing fishing pressure with no management system in place to address the decline. It is understood that future audits may have this to address should the situation continue the trend, following IOTC Scientific Committee projected stock trajectories.

	Hence there is a "high degree of certainty" that the stock has been above the MSY reference points in recent years. Thus, this meets SG100.	• At SG100 the team shall present evidence that the stock has fluctuated around the target reference point for longer periods (than demonstrated for SG80). We do not feel sufficient evidence has been provided for the current stock status (noting the length of time since the last assessment). We do not have a defined longer period of time than that in SG80, we do not have a defined period of time in SG80 either.

Nonconformance with MSC requirements

There is not apparent evidence to demonstrate conformance with the following certification requirements:

CB2.2.2 The team shall consider the biology of the species and the scale and intensity of both the fishery and management system and other relevant issues in determining relevant time periods over which to judge fluctuations.

CB2.2.2.1 At SG80, there shall be evidence that the stock is at the target reference point **now** or has fluctuated around the target reference point for the past few years.

CB2.2.2.2 At SG100, there shall be evidence that the stock has fluctuated around the target reference point for longer periods.

PI 1.2.1 There is a robust and precautionary harvest strategy in place

WWF's comments on the assessment team conclusion for PI 1.2.1 issues are based on the MSC definition of a harvest strategy as, "The combination of monitoring, stock assessment, harvest control rules and management actions, which may include a management procedure (MP) or an MP (implicit) and be tested by management strategy evaluation (MSE). Further, in the Guidance to the MSC Certification Requirements (GCB2.5) the control rules and tools in place are considered key elements of a harvest strategy. There are no defined harvest control rules for this fishery at this time.

Currently there are no harvest control rules and subsequent management actions that are tested by management strategy evaluation

WWF also would like to see the assessment team present evidence of Harvest Control Rules as per MSC definition "A set of well-defined pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points."

Scoring Issue	Assessment Team Rationale	Comment

SG60 The harvest strategy is expected to achieve Stock management objectives reflected in the target and limit reference points.	No direct reference made to this issue by the team or rationale provided	• No comment able to be made.
SG60 The harvest strategy is likely to work based on prior experience or plausible argument.	No direct reference made to this issue by the team or rationale provided	• No comment able to be made.
SG60 Monitoring is in place that is expected to determine whether the harvest strategy is working.	The work of the WPTT provides clear evidence that monitoring of this stock is adequate to determine whether the harvest strategy is working. The different parts of the strategy include maintaining both B/BMSY and F/FMSY. Data are collected to estimate these quantities and updates and assessments conducted. The latter reports best estimates of biomass, which indicates whether management is achieving its objectives or not. That being said there is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible. Therefore, although the fishery clearly meets the SG60, it does not meet the SG100.	• no comment

SG80 The harvest strategy is responsive to the state of he
 	
stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.
	Scientific advice has been formulated relative to a harvest strategy which is, in turn, relative to MSY reference points. This is responsive to that state of the stock and to limit and target reference points commonly used for bigeye and other tropical tunas, meeting the SG80.	• In order to satisfy this PI to the 80 level (which by title calls for a **robust and precautionary harvest strategy in place)**, where there are no conditions, it assumed that a harvest strategy is actually in place that meets the MSC definition. Therefore we ask the questions:
		  ○ Is there a system of monitoring in place? Yes
		  ○ Are assessments of stock made? Yes
		  ○ Are there well-defined pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points? **No**
		  ■ the assessment team **must** provide objective evidence of **well-defined pre-agreed rules or actions** used by IOTC for determining a management action in response to changes in indicators of stock status with respect to reference points
		• In IOTC RES 12/01 the initial approach is outlined to developing reference points as a step on the pathway toward developing harvest control rule and ultimately a harvest strategy at some future time. The IOTC itself does not consider there to be a harvest strategy in place at this time.
		• RES 12/01 is limited to committing the members of the IOTC to consider the advice supplied by the IOTC Scientific Committee relating to reference points and associated harvest control rules. It does not commit the IOTC to adopting any reference points or harvest control rules. MSC requirements call for some objective evidence of a harvest control strategy, not expectations that one may possibly be developed at some indeterminate time in the future.
		• IOTC RES 13/10 notes that the IOTC Scientific Committee has initiated a process leading to a management strategy evaluation which in turn will complement the work on harvest control rules. Again it is acknowledged that the first steps are being taken on the path to developing the components necessary to satisfy the MSC definition of harvest strategy.

		• In 2012 the management advice provided by the Scientific Committee indicated that annual catches of yellowfin tuna should not exceed the lower range of MSY (300,000 t) in order to ensure that stock biomass levels could sustain catches at the MSY level in the long term. Catches have exceeded this level in 2011 and 2012. The evidence available shows that there are no responses taken to the state of the stock, and no elements in fact work together to achieve any management objective. The onus is on the CAB to provide objective evidence otherwise. This evidence is not apparent. • Information collection and stock assessments do not equate to there being a harvest strategy, contrary to what the assessment team seem to be suggesting.
SG80 The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	It is clear from the report of the WPTT that while the harvest strategy may not have been fully tested, none the less, monitoring is in place. Further It is evident from the most recent assessment that for this stock a) the catch is below MSY, b) the stock is overfished. This indicates that overall controls on the exploitation of this stock has been adequate to date and the harvest strategy is achieving its objectives. This meets the SG80.	• As this is an important point, please outline in detail the measures in currently in place to constrain effort. • We submit that the only evidence available indicates that advice from the Scientific Committee is ineffective in controlling harvest of the yellowfin tuna stocks, ie advice provided by the IOTC Scientific Committee is not actioned by the IOTC. In fact the only effective mechanism demonstrated to date has been the exclusion of fishing vessels from the fishing areas off Somalia by pirate activity. • Furthermore, striped marlin, a species which is also under the management mandate of the IOTC has been overfished and subject to overfishing and in the red quadrant of the Kobe plot for a number of years (eg. Report of the 16th Scientific IOTC Committee; Report of the 17th IOTC Scientific Committee) clearly demonstrates the inability of the IOTC, in the absence of any harvest strategy supported by defined harvest control rules to respond effectively to a stock under severe pressure. ○ We maintain that the only evidence which currently exists demonstrates that whatever harvest strategy may be in place, implicit or otherwise, is clearly unable to meet its objectives.

		• To conform with MSC CR CB2.5.1.2 the CAB shall provide evidence of the involvement of some sort of structured logical argument and analysis that supports the choice of strategy.
SG100 The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.	N/A	no comment
SG100 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.	N/A	no comment
SG100 The harvest strategy is periodically reviewed and improved as necessary.	N/A	no comment

Nonconformance with MSC requirements

The CAB failed to use the definition of harvest strategy and harvest control rules required by the MSC Certification Requirements v1.3 in the scoring of PI 1.2.1 (MSC-CR-v1.3 - Annex AA: MSC-MSCI Vocabulary – Normative)

PI 1.2.2 There are well defined and effective harvest control rules in place

Scoring Issue	Assessment Team Rationale	Comment
SG60 Generally understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Harvest control rules for this stock are not well-defined and there is no specific plan of control if the stock size falls below the trigger point (MSY). There is, however, evidence of an intention to end overfishing and rebuild this stock should depletion occur and the scientific committee is called on to provide such advice. Therefore there are generally understood harvest rules in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached meeting the SG60.	● We would expect to see the assessment team present evidence of Harvest Control Rules as per MSC definition "A set of well-defined pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points." ○ There currently are no well-defined pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points. If there are well-defined pre-agreed rules or actions <u>in place</u> the CAB must provide objective evidence of these. ● IOTC Resolution 13/10 presents a range of interim figures and a decision framework for use by the IOTC Scientific Committee in their work to develop reference points and **eventually** recommend a harvest strategy and associated harvest control rules for the **consideration** of members of the IOTC. Until those are adopted as a binding resolution by the IOTC, there are **no harvest control rules in place** (generally understood or otherwise) for yellow fin tuna or any other species in the Indian Ocean under the management mandate of the IOTC. This is a simple statement of fact.

SG60 There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Limiting Fishing Effort: The CAB refers to a number of IOTC Resolutions which they claim represent tools available to the IOTC in achieving exploitation levels required under the (future) harvest control rules. These include 01/04, 03/01, 06/05, 12/11 Area Closure: "Overall, the IOTC has demonstrated the ability via resolution to use spatial/temporal closures and intent to understand how these can be effective at controlling exploitation. This constitutes some evidence of use of an appropriate tool to control exploitation and to understand the efficacy of the tool." Catch Allocation: "In addition, the IOTC has an ongoing process to develop a catch allocation scheme and has already developed allocation principles. IOTC RES 13/10 and the MSE research planning and contracting, and IOTC MSE workshop reports (C2_WK_MSE_REPORT), together with work on allocation (IOTC-2011-SS4-PropA[E], IOTC-2011-SS4-	• Limiting Fishing Capacity and Effort ○ As you would expect, the preamble of Resolution 12/11 (On the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating Non-Contracting Parties) states its intent, "RECOGNISING the need.....to allow the stabilisation of the level of fishing capacity active on the stocks of high commercial value under the IOTC responsibility…", however <u>crucially</u>, the Resolution <u>does not contain a single paragraph limiting capacity to any particular level, stock, fleet, or other unit of management</u>. Instead the clauses relate to the provision of information to the IOTC Secretariat, transfer of capacity, and fleet development plans. ○ The only vague reference to limiting capacity is in the the narrow scope of Paragraph 4, which is where CPCs may change the the number of their vessels, by gear type, where the change "does not lead to an increase of fishing effort on the fish stocks involved". However, even this paragraph is immediately voided by the existence of fleet development plans. ○ Each year the Compliance Committee assess CPCs' level of compliance by IOTC CPCs "to some of the more prominent IOTC resolutions adopted in past sessions". Compliance is generally low, although gradually improving. For example, in 2013, compliance with Resolution 12/11 (Limitation of fishing capacity and fleet development plans) had improved to only 59%, compliance with the Bigeye Tuna Statistical Document Programme (Resolution 01/06) improved slightly to 45%, and the Reporting of Mandatory Statistics on IOTC Species (Resolution 10/02) remained the same at 39% (IOTC-2014-CoC1-03 Rev1 [E]). These are measures that underpin the basic management of IOTC species. "There are still many CPCs not meeting their obligations to provide information under the various CMMs covered in the paper" IOTC–2014–CoC11–R[E] in spite of intervention from the IOTC Secretariat, yet the CAB suggests that "rules" in place in the

	PropB[E], IOTC-2013-TCAC02-R[E]) clearly demonstrates the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction, though as of Nov 2013 these have not yet been used." "The IOTC-2011-SC14-40 report concluded that "It would therefore be precautionary to supplement closures with additional management measures, either to reduce fishing effort, ... , or to apply catch controls such as the quota allocation system required in Resolution 10/01."	IOTC are effective in controlling effort. Measures/rules can only be effective if implemented. ● Effects of Piracy The Scientific Committee has clearly stated over the last few years that any decreases and shifts in effort or capacity are most likely due to piracy in the western Indian Ocean (e.g. IOTC–2014–WPTT16–R[E]). Thus it is not the result of the IOTC having implemented any management measures that are considered to be controlling harvest. In fact the latest scientific reports of the Scientific Committee and its working parties throughout 2014 clearly documented that as a result of the decline in piracy in the western Indian Ocean in the last one to two years, effort has returned and/or exceeded previous levels. The most recent advice for tropical tunas shows "...that since 2011, there has been an increase in the number of active longline vessels in the Indian Ocean for Japan (68 in 2011, 72 in 2012 and also in 2013), China (15 in 2011, 36 in 2012 and also in 2013), Taiwan,China (132 in 2011, 138 in 2012 and 147 in 2013) and the Philippines (2 in 2011, 14 in 2012 and 9 in 2013) (Fig. 13a). Similarly, there has been an overall increase in the number of active purse seine vessels in the Indian Ocean for the European Union and assimilated fleets (34 in 2011, 37 in 2012 and 35 in 2013) and for all other purse seine fleets combined (23 in 2011, 31 in 2012 and 48 in 2013) (Fig. 13c)." (IOTC–2014–WPTT16–R[E]). ● Fleet development plans ○ Fleet Development Plans provide an exemption to any capacity constraints. All that is required is for the Fleet Development Plan is written in accordance with the provisions of Resolution 02/05. ○ As the CAB itself quotes from IOTC-2014-CoC11-05 REV1[E] (Report on the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating non-Contracting Parties) "In relation to tropical tunas, the results

		indicate that the active capacity in 2013 (516,233 tons) has decreased relative to the baseline capacity of 2006 (576,163 tons), and it was just over half the reference limit capacity of 993,662 tons, that was expected for 2013. The lower than expected value is the results of reductions in capacity of most fleets, and also the failure of the majority of CPCs with a fleet development plan, to implement the plan". Table 1 in IOTC-2014-CoC11-05 Rev1 (Report on the Implementation of a limitation of fishing capacity of CPCs) clearly shows an estimated (due to lack of reporting by a number of countries) 2013 total capacity which is 172% that of the 2006 baseline if the Fleet Development Plans were realised. If this capacity is realised, the resulting fishing pressure on the tropical tuna will clearly exceed sustainable limits, noting that yellowfin tuna is already on the cusp of being overfished. Further, following amendments to some countries Fleet Development Plans, the capacity for tropical tunas in 2020 will be 249% that of the 2006 baseline. ○ Table 2 in IOTC-2014-CoC11-05 Rev1, demonstrates that while capacity may not yet be higher than the 2006 reference level, the number of vessels is: 5,502 vessels active in 2013, when the 2006 reference level is 3,799 vessels. 145% of the 2006 baseline. If the proposed Fleet Development Plans were fully realised for 2013, the number of active vessels would have been 5,574, 147% of the 2006 baseline. No recommendation was forthcoming to the Commission from the 2014 Compliance Committee as a result of these numbers even as a precautionary management response to projections of overfishing of the yellowfin tuna stock by IOTC stock assessment scientists. ● Of the 32 Cooperating Parties, 22 countries now have Fleet development Plans (IOTC-2014-CoC1 -05 Ad_1[E], Collection of Fleet Development Plans). The list of countries that have fleet development plans includes China and India - the world's two largest countries by population, equalling 35% of the world's population - and Indonesia - the world's largest tuna fishing nation, and countries with large gillnet fisheries for which

		unreported catches and data uncertainty are extremely high (e.g. IOTC–2014–WPTT16–R[E]). ○ Compounding the concerns regarding availability and quality due to gillnet fishery take, the most recent Working Party on tropical Tunas mirrored previous meeting statements about concerns with the increasing scale of the gillnet fishery(IOTC–2014–WPTT16–R[E]). In addition to the lack of data available. For example: "...in recent years the catches of bigeye tuna by gillnet fisheries are likely to be higher, due to major changes experienced in some of these fleets (e.g., Sri Lanka and I.R. Iran) - notably changes in boat size, fishing techniques and fishing grounds, with vessels using deeper gillnets on the high seas in areas where catches of bigeye tuna by other fisheries are important."; and for skipjack, "the SC NOTED that spatial distribution of catch and effort and length frequency sampling in gillnets (especially in the eastern Indian Ocean) are incomplete which does not allow to proper configuration of gillnet catches in the stock assessment model (as they are currently aggregated into the 'Other' fleet category). The increase in the relative importance of the gillnet fishery for skipjack tuna, requires that those countries involved in skipjack tuna gillnet fisheries, as a matter of priority, collect the data as requested by IOTC.". Also, scientific observers are not being deployed under the IOTC Regional Observer Scheme on board large-scale gillnet vessels operating in the Indian Ocean. Despite all of these concerns, and in light of the deteriorating state of the yellowfin stock, the gillnet fishery remains essentially unmanaged. There has been no management response, no rules put in place to restrain capacity or catch, and no tightening of enforcement of existing rules around data collection. ■ In addition, countries may flag their vessels to other countries, therefore the viewing the current economic situation of a CPC is not necessarily a good indicator of whether or not it realise its Fleet Development Plan aspirations.

		■ The lack of constraint of capacity in either Resolution 12/11 or any other IOTC Resolution, and the fleet development plans are clear evidence that there is currently no recorded intent to implement an effective harvest control rule in the IOTC. ○ The CAB incorrectly states "13/10 the IOTC Scientific Committee were required to apply the interim reference points in the provision of advice on the status of stocks as well as when making recommendations for management measures. In respect to the latter the IOTC Scientific Committee was required to take account of the specific objectives, namely that it aimed at ending overfishing with a high probability in as short a period as possible." Resolution 13/10 says that the "IOTC Scientific Committee should apply" the references points, not that they must. There is nothing in resolution 13/10 that even implies "In respect to the latter the IOTC Scientific Committee was required to take account of the specific objectives, namely that it aimed at ending overfishing with a high probability in as short a period as possible.". Even if the Scientific Committee does apply the reference points, and determine there is a need to cease overfishing, there is no evidence of how the Commission would respond. ● Area Closures ○ Unfortunately the sole spatial/temporal controls agreed to by the Commission relating to the conservation of yellowfin tuna stocks were removed from RES 12/13 by members of the IOTC at the 18th Session of the Commission. ○ This is not surprising as the closed area defined by the Resolution 12/13 was created off Somalia which was not a member at the time, and therefore in no position to object to the proposal. When Somalia became a member of the IOTC the closed area was removed and no further closed areas or spatial limitation of fishing effort have been, or are likely to be, agreed to by the IOTC members.

		○ While it may appear that there was the intention to use spatial closures as an effective management tool for juvenile bigeye and yellowfin tunas, when provided with options to potentially improve the closures, the Commission decided not to modify the closure. You would expect adaptive management if time-area closures were actually a (pseudo) harvest control rule. The Commission has previously requested research into time-area closures in the Indian Ocean. There has been no formal testing of the effectiveness of time area closures, therefore it can not be considered a harvest control rule. The likely effectiveness and appropriateness of time-areas closures would need to be assessed in a process, such as a Management Strategy Evaluation. That said, there was an initial assessment in 2012. The SC NOTED paper IOTC–2011–SC14–39, "which provided an evaluation of the IOTC time-area closure by estimating what the maximum potential loss of catches would be under different scenarios of time-area closure, as estimated from the catch statistics of the IOTC". "The results of the study indicated that the current network including an IOTC closure of only two, one month closures (one month for purse seine and one month for longline), is likely to have little impact on stock status, whether effort is eliminated or redistributed". However, "some benefits to the status of yellowfin tuna stocks were predicted if it is assumed that effort (and catch) is eliminated [in variations of the closure of the current IOTC time-area closure], but where effort is redistributed such a closure had negligible impact on stock status". The SC "NOTING the lack of research examining time-area closures in the Indian Ocean by the WPTT in 2011 and 2012, as well as the slow progress made in addressing the Commission request, the SC reiterated its RECOMMENDATION that the SC Chair begins a consultative process with the Commission in order to obtain clear guidance from the Commission about the management objectives intended with the current or any alternative closure. This will allow the SC to address the Commission request more thoroughly." This has not occurred.

		• Quota Allocation • MSC certification should not be based on somewhat hopeful projections of what may be implemented at some undefined future date. • The CAB attests that Resolution 13/10 and MSE planning and contracting "...clearly demonstrates the intent to adopt catch limitation measures for all tunas under IOTC jurisdiction, though as of Nov 2013 these have not yet been used.". Intent is not any sort of "evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation". Again, this is about future speculation, without any precedence of action having previously occurred. The IOTC precedence has been inaction. • Resolution 10/01 mentioned by the team required an allocation system be adopted by 2012. Resolution 05/01 (On Conservation and Management Measures for Bigeye Tuna, paragraph 5) states: "During this three year period the Commission shall develop a mechanism to allocate, for specific time periods, bigeye tuna quotas for all CPC"s." Both of these failed to occur and provides evidence that when the IOTC attempted to implement a tool is has been ineffective, failing to justify the 60 level score. (In Resolution 14/02 the date of implementation for an allocation system or alternative methods has been removed altogether). • The CAB states "In addition, the IOTC has ... already developed allocation principles." These principles were endorsed by the Commission in 2011, however they are fairly rudimentary. A sub-group of parties at the TCAC in 2013 attempted to refine them in 2013, but failed to obtain consensus (IOTC–2013–TCAC02–R[E]). • Unfortunately the IOTC discussions of allocation as a control mechanism has not been continued for 2014 and it remains to be seen whether it is revived in 2015.

		Evidence suggest that this tool is unlikely to become available to manage the fishery for the foreseeable future. ● Despite a request from second Technical Committee on Allocation Criteria (TCAC) meeting in 2013 to not been convene a third TCAC, this has not occurred. At the most recent TCAC meeting, the TCAC "AGREED to organise the next Session in the first quarter of 2014. The exact dates and meeting venue will be confirmed and communicated by the Secretariat at a later date (IOTC–2013–TCAC02–R[E])." The Commission noted this agreement (IOTC–2013–S17–R[E]). On 27 September 2013 a request was sent to members "...to invite interested CPCs willing to hosting the TCAC03 to contact the Executive Secretary not later than the 29 November 2013" in order to hold a meeting in the first quarter of 2014 (Circular IOTC CIRCULAR 2013–86). No member has indicated willingness to host at any time since this request, so no meeting has occurred. The Circular also notes "I recommend that sufficient time be set aside to also discuss other management options based on the Scientific Committee recommendations". Even if a TCAC03 had met, no other management options have been developed by the Scientific Committee. ○ We therefore note with some concern that although this issue at the 60 level can be satisfied by providing evidence that tools used to implement harvest control rules are (present tense) appropriate the assessment team only discusses a range of tools and other control mechanisms that have only been proposed or will only (perhaps) be implemented in the future and therefore this does not meet SG60. ● Comparison to Albacore ○ Most importantly, the CAB provides a list of CMMs throughout this scoring rationale, which it says show intent to use harvest control rules. The same or very similar rules

		apply for the albacore stock, however when that species was deemed subject to overfishing, no management actions were taken. Albacore was 'subject to overfishing' for 3 years (catch data years 2010-2012). In 2014 the Scientific Committee determined the stock as not subject to overfishing, “although considerable uncertainty remains in the SS3 and ASPIC assessments, indicating that a precautionary approach to the management of albacore should be applied by reducing fishing mortality or capping total catch levels to those taken in 2012” (IOTC-2014-SC17-R[E]). This change in stock status was not due to management actions. The change was a result of a change in approach to assessing the relative merit of the different stock assessment models used, and the fleets moving back to the areas where piracy was a previously problem.
SG80 Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.		no comment
SG80 The selection of the harvest control rules takes into account the main uncertainties.		no comment
SG80 Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation		no comment

levels required under the harvest control rules.		
SG100 The design of the harvest control rules take into account a wide range of uncertainties.		no comment
SG100 Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.		no comment

Nonconformance with MSC requirements

The CAB failed to use the definition of harvest strategy and harvest control rules required by the MSC Certification Requirements v1.3 in the scoring of PI 1.2.2 (MSC-CR-v1.3 - Annex AA: MSC-MSCI Vocabulary – Normative)

PI 1.2.3 Relevant information is collected to support the harvest strategy

Scoring Issue	Assessment Team Rationale	Comment
SG60 Some relevant information related to stock structure, stock productivity and fleet	No direct reference made to this issue by the team or rationale provided	● no comment able to be made

composition is available to support the harvest strategy.		
SG60 Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	No direct reference made to this issue by the team or rationale provided	no comment able to be made
SG80 Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.		no comment
SG80 Stock abundance and fishery 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.		no comment
SG80 There is good information on all other	"It is apparent that IOTC has put considerable effort into the recording and reporting of catches and that	Satisfying the SG80 is not conditional, ie. it is immaterial that there is a number of small countries involved and that the task is difficult to monitor certain vessels. Also, there are countries which are not 'small' and which

fishery removals from the stock.	the current level of reporting is adequate given the large number of small countries involved and the difficult task of monitoring small vessels often far away or on the high seas. Overall, data are sufficient to meet the SG80. “	operate industrial scale vessels which are not providing data in compliance with the IOTC Resolutions. To justify scoring this fishery to 80 level the CAB must include a discussion of levels of compliance with the IOTC Resolutions cited. According to the report of the 16th IOTC Scientific Committee: ● catches of yellow fin tuna are less certain for: ○ many coastal fisheries, notably those from Indonesia, Sri Lanka, Yemen, and Madagascar the gillnet fishery of Pakistan non-reporting industrial purse seiners and longliners (NEI), and longliners of India. ● From the same report, catch-and-effort are not available for some important fisheries or they are considered to be of poor quality for the following reasons: ○ no data are available for the fresh-tuna longline fishery of Indonesia, over the entire time series, and data for the fresh-tuna longline fishery of Taiwan,China are only available since 2006 ○ insufficient data for the gillnet fisheries of Iran and Pakistan ○ the poor quality effort data for the significant gillnet/longline fishery of Sri Lanka ○ no data are available from important coastal fisheries using hand and/or troll lines, in particular Yemen, Indonesia, and Madagascar.
SG100 A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the	N/A	no comment

current harvest strategy, is available.		
SG100 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.	N/A	no comment

Comments on P2:

CAB: Principle two on the ecosystem background explicitly mentions about purse seine tuna fishery based on sets made on free schools whereas the purse seine sets made on FADs or floating objects are not included in the report.

Issue: There is no clarity on whether these two operations take place within proximity of the fishing area.

CAB: 3.4.1 (page 70) highlights the discard of tuna catches according to size, however it is also said that it is negligible but no quantity is mentioned. It is said that matter of discards is part of principle 1 and not 2 so no further attention is given.

Issue: In terms of science a weightage or tonnage of discards and its class size should be documented. The matter of discards and its class size are a topic of minimizing environmental impact.

CAB: 3.4.1 It is highlighted in this section that a wide range on non-tuna catches may be associated with the fishery, and the Echebastar group has limited data on the unwanted catch.

Issue: References are provided for purse seine EU fleets operating in the area, and it seems vague to generalize by catch data of the Indian Ocean with the Echebastar purse seine fishery. Robustness of the data is emphasized in this regard.

CAB: 3.4.1 The number of observed sets from EU purse seine sardine fishery are well documented.

Issue: The observations on the Echebastar purse seine fishery is lacking. These gaps need to be filled to take into account the by catch species and its composition.

CAB: 3.4.1 (Figure 3.4.1) documents about the catches of FADs by catch and provides comparison with free school catches of non-target species.

Issue: While the catches of free schools are lower, it is suggested to include the number of FAD operations and free school operations as a whole in the area which accounts to high fishing effort and high by catch, similarly for operations of gillnet gear are also responsible for catches of sharks. A NPOA for sharks and its implementation is recommended or must be set as a condition. SG80 score is unclear as scientific data is lacking for management and conservation of shark species resolution 13/06.

CAB: 3.4.1 The stock status for some of the by catch species of sharks and billfish is not clear and the IOTC has not provided the status of the species.

Issue: It is suggested to apply the precautionary approach and work on providing data on the by catch species in particular sharks and billfish. The SG80 score is unclear in the absence of stock status of sharks and billfish species caught.

CAB: 3.4.1 Around 65% of billfish are discarded.

Issue: This maybe a significant quantity considering that this can cater to food security. Also considering the stock status of billfish it is suggested to land all billfish species caught in purse seine fishery.

CAB: 3.4.1 Rays: “While useful for identifying which species or species groups are theoretically at risk, the study does not take into account the actual number captured and is therefore of limited direct significance in estimating outcomes status for the fishery under assessment for data deficient scoring elements under 2.1”.

Issue: This is a clear gap in the assessment and needs to be further addressed.

CAB: 3.4.1 for SG80 the requirement is to consider the effect of the fishery only on ‘main’ retained species, and no further consideration is given to any other species then tuna.

Issue: It is highlighted in this context that these could potentially include ETP species and some consideration must be given while conducting the risk based framework.

CAB: 3.4.1 Principle one scores SG80 for target tuna stocks thus the principle two also scores SG80 for 'main' retained species. There is reference to IOTC stock assessment data for Albacore, Bigeye, Yellowfin and skipjack from 2011 and 2010 is below MSY except for albacore where MSY is higher.

Issue: There is some confusion in these statements and the justification is not clear.

CAB: 3.4.1 There is a mention of YFT stocks recovering due to piracy, whereas previous assessments indicated YFT stocks as over-exploited.

Issue: I turn the attention to table 3.4.1 Echebastar total catch tuna species for free school sets by vessels for the fishing years 2010-2012 the YFT accounts for 19,327 Kg for selected vessels. Taking into account the numbers of YFT caught by purse seine vessels in the IOTC area of competence this number goes even higher, even when piracy was at a high during 2008 – 2012.

CAB: 3.4.1 The SICA analysis for the data deficient species such as oceanic white tip and silky sharks still account for SG80 score while the text refers to reproductive capacity impacts on the species.

Issue: Taking into account the number of gillnet operations and the purse seine FAD fisheries operating in the IOTC area of competence there needs to be a more robust strategy in place and a more robust management plan for sharks.

Suggestion: 3.4.1 The adoption of the harvest control rules and reference points along with ban on discards of YFT, BET and SKJ measures adoption should be considered as a condition for certification.

CAB: 3.4.1 The Echebastar fishing fleets have observers on 100% of its vessels.

Issue: Is there any comment/report from the chair of the working party on ecosystem and by catch from this fishery?

Suggestion: 3.4.5 Ecosystem: It is suggested to include limiting of capacity for fisheries. This is in direct relation with having harvest control rules and limit reference points. A management strategy evaluation would help determine management objectives for this fishery.

Comments on P3:

PI 3.1.2 SG80b: **Cannot make sense of the justification for SG80. Language is jumbled. The CAB will need to re-submit this for further review once it has been redrafted. e.g. "The information for management system is provided for each part agrees to protocols and rules of the organization. Riverine countries to seek and accept relevant information, including local knowledge to nourish the management system."; "The management system demonstrates consideration of the information obtained specially with scientific information. The scientific report is based in the best scientific information available but this is not the case with other information as socioeconomic issues between others."**

PI 3.1.2 SG80c: **Cannot make sense of the justification for SG80. Language is jumbled. The CAB will need to re-submit this for further review once it has been redrafted. eg. "IOTC done the opportunity for participation in key meeting for all interested and affected parties involves in the fishery but not all the parties are interested in participating actively."**

CAB: PI 3.1.3 SG80a: "Resolution 13/10 and Recommendation 12/14 establishes limit reference points as part of a precautionary approach"

Issue: Note that IOTC Recommendations can't be used as objective evidence in any scoring rationale. These are non-binding and have no real relevance to ensuring sustainability of stocks or minimising impact on ecosystem.

Issue: Resolution 13/10 did not in fact establish limit reference points or any other reference points for use in the managment of the tuna stocks. Interim reference points were identified for the use of the Scientific Committee in developing and assessing harvest strategies and harvest control rules.

CAB: "Furthermore, there are evidences to apply precautionary approach and ecosystem based management in IOTC resolutions including by catch reduction program or monitoring of ecosystem indicators."

Issue: The CAB needs to provide the evidence mentioned. It's not sufficient merely to say there is "evidence". Please provide clear evidence of an effective application of the precautionary approach to management of tuna or tuna-like species under IOTC mandate. Please provide clear evidence of an effective application of ecosystem based management practices to management of tuna or tuna-like species under IOTC mandate

CAB: "The precautionary approach includes the adoption of interim target and limit reference points and IOTC Recommendations13/10 and

12/14 on interim target and limit reference points. These measures establish clear and explicit requirements though being considered "interim" can be understood as "partially required".

Issue: No - 'interim' cannot possible be understood as "partially required"

CAB: "Furthermore, the IOTC are implementing the analytical tool Management Strategy Evaluation (MSE) which integrates inter alia, the precautionary principle and will serve to establish new HCR better adapted to current management objectives."

Issue: No the IOTC are not implementing this at this stage. They are currently developing operating models for the stocks for which MSE will later be taken. This highlights a common theme in the assessment of this fishery against MSC requirements where possible future implementations of tools are presented as being in current use.

PI 3.2.2 SG80a: Cannot make sense of the justification for SG80. Language is jumbled. The CAB will need to re-submit this for further review once it has been redrafted.

PI 3.2.2 SG80b Cannot make sense of the justification for SG80. Language is jumbled. The CAB will need to re-submit this for further review once it has been redrafted.

PI 3.2.2 SG80c:

CAB: "IOTC take into account the precautionary approach and this is used in practice under most circumstances intake of decisions."

Issue: The CAB needs to outline which resolutions have been adopted since the adoption of Resolution 12/01. They also need to outline the Proposals for conservation measures which were deferred due to lack of scientific data.

We remind that the precautionary approach, as defined by the UNFSA and adopted by the IOTC, require the IOTC to "determine, on the basis of the best scientific information available, stock-specific reference points and the action to be taken if they are exceeded". Neither of these conditions have been met and therefore it most certainly cannot be stated that the approach is being used in practice.

We remind that Resolution 12/01 states

"In applying the precautionary approach, the Commission shall adopt, after due consideration of the advice supplied by the IOTC Scientific Committee,

a) stock-specific reference points (including, but not necessarily limited to, target and limit reference points), relative to fishing mortality and biomass, and

b) associated harvest control rules, that is, management actions to be taken as the reference points for stock status are approached or if they are breached. "

We point out that to date, the Commission is waiting on advice from the Scientific Committee on both reference points and associated harvest control rules, therefore it cannot be stated that the precautionary approach has been implemented by the IOTC.

Conditions:

Conditon 2.

CAB: By year 4: An appropriate Harvest Control Rule should be tested and agreed by IOTC.

Issue: The 'should' must be a 'shall', otherwise the entire condition becomes non-mandatory and may be essentially ignored by the fishery. Note: similar comment for Conditions 4 & 6

CAB: The milestones conclude with a requirement that an HCR be adopted by the IOTC by Year 4.

Issue: At no time prior to this are any proposals to the IOTC required or support for such proposals by the client required. The condition must outline the pathway a HCR will take through the IOTC process, including the inputs and contributions to this process by the client in a visible and measurable way. During which year of the certification can it be expected that the EU will make, or contribute to a proposal on an HCR? Note: similar comment for Conditions 4 & 6

Issue: There are no milestones relating to development of HCR proposals to the IOTC. Proposals should be presented to the IOTC as soon as possible, acknowledging that it may be several years between a proposal and a Resolution being adopted.

Issue: There is no part of the action plan requiring the client to collaborate with other MSC fisheries in the promotion and development of appropraite HCRs for skipjack tuna.

Condition 7

CAB: Pesqueras Echebastar has 100% observer coverage on board of their vessels during 100% of time (one observer by vessel). The observers of SFA and internal staff will undertake survey of bycatch and discards, with sufficient detail (species, sex, capture location, size and fate) to enable quantification of species composition and total catch and vulnerable species bycatch. It will be recommended to engage with research entities (AZTI and IEO) for the analysis of these data collected by the observers.

Issue: Observer coverage for both EU-SPain and Seychelles has been recorded as 0% for all years 2010,2011,2012,1013 (Appendix B IOTC–2014–SC17–08). The milestones should measure progress against this condition by requiring this figure increase above a reported zero percent observer coverage by the first year.

Condition 9:

Issue: At no point in the action plan or milestones is the client's contribution toward an EU backed IOTC proposal or support for the appropriate scheme of incentives and penalties detailed.

Condition 10:

Issue: It is not sufficient for something to be 'discussed'. The milestones must be quantifiable and measurable.

CAB: Evidence that… "that Pesqueras Echebastar and representatives of the Government of Seychelles in the IOTC have posed this situation to the IOTC."

Issue: This requires clarification. Do you mean submitted as a proposal to the IOTC?

General:

The report in general does not conform with the MSC requirement 27.10.6.2 The rationale shall make direct reference to every scoring issue and whether or not it is fully met.

In most PI's a number of scoring issues were not referenced or justification provided, and no stakeholder comment was able to be made.

FCI Response to WWF

The FCI assessment team offers the following response to the key concerns noted in the letter submitted by Mr. Wetjens Dimmlich of WWF.

P1 response

SG100 There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
... Therefore, taking account of the uncertainty associated with the base case status estimates, there is a high degree of certainty (i.e. greater than 95%, as set out in MSC CR CB2.2.1.3) that the stock is above the point where recruitment would be impaired – the default value for this being around 50% of the BMSY level. This meets SG100.

The comments below are for yellow fin

- The team make their conclusions on the current state of the stock based on results of assessment conducted in 2011. It is a very big assumption to claim 95% certainty in the current stock levels, several years hence, particularly in justification of a 100 score. (CB2.2.1.3 High degree of certainty means greater than or equal to the 95th percentile.)
  RESPONSE: The conclusions on the current state of this stock were based on results available at the time of writing the original report. Since then the report of the Seventeenth Session of the IOTC Scientific Committee (IOTC–2014–SC17–R[E]) have become available.
  For Yellowfin tuna that report notes that as "*No new stock assessment was carried out (for yellowfin tuna) in 2014, (thus,) stock status is determined on the basis of the 2012 assessment and other indicators presented in 2014. The stock assessment model results from 2012 did not differ substantively from the previous (2011) assessments; however, the final overall estimates of stock status differ somewhat due to the refinement in the selection of the range of model options due to increased understanding of key biological parameters (primarily natural mortality)".*
  With respect to management reference points, the report notes: "*While the MFCL assessment indicates that fishing mortality is below the limit and target reference points during the whole time series, the ASPM model run indicates that the target reference points may have been exceeded during the period of high catches in the mid 2000's (2003–2006)".*
  While "*estimates of total and spawning stock biomass show a marked decrease from 2004 to 2009 in both cases, corresponding to the very high catches of 2003–2006. Recent reductions in effort and, hence, catches resulted in a slight improvement in stock status in 2010. Spawning stock biomass in 2010 was estimated to be 38% (31–38%) of the unfished levels.*
  The report concludes "on the weight-of-evidence available in 2014, the yellowfin tuna stock is determined to be not overfished and not subject to overfishing"
  Further, in the 2014 report, SB_{cur}/SB_{MSY} = 1.24 with the 80% confidence interval given as 0.91, 1.40. The estimated 95% confidence interval (one sided as we are only concerned with the likelihood that SB_{cur} could be as low as 40% SB_{MSY}) for SB_{cur}/SB_{MSY} = 0.82. Thus we can conclude, on the basis of the most recent report on the state of this stock, that the probability that $SB_{cur}/SB_{MSY} \leq 0.4$ is less than 5%

- The Kobe plots referred to by the team indicate clear downward trajectory of biomass (up to 2010) toward an overfished state, with one plot suggesting biomass had fallen below B_{targ}, approaching B_{lim} before recovering (believed to be due to piracy excluding vessels from a key fishing area). This is not the biomass trajectory of a fishery where it could be said with 95% certainty that the stock IS above any specific point. Likely, or perhaps even highly likely, but not with a high degree of certainty. A maximum score of 80 would be justified.

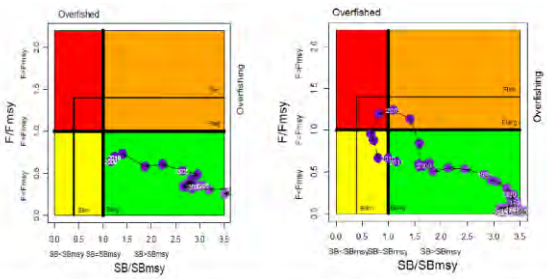

Fig. 1. Yellowfin tuna: MULTIFAN-CL and ASPM Indian Ocean yellowfin tuna stock assessment Kobe plots. Blue circles indicate the trajectory of the point estimates for the SB ratio and F ratio. The left panel is output obtained from the base case run in MFCL for each year 1972–2010 for a steepness value of 0.8. The right panel is obtained from the ASPM base case model run for each year 1972–2011 with steepness value of 0.9.

RESPONSE: Rather than a downward trajectory of biomass toward an overfished state, the Kobe plots indicate a clear trajectory of biomass toward *the chosen target for this fishery, namely; SB/SB_{MSY} =1 and F/F_{MSY} = 1.* This is consistent with the management strategy for the fishery, where, in a long term sense, SB_{MSY} is the expected average biomass that will result from fishing constantly at F_{MSY} (the chosen target).
The results obtained using an age structured production model (ASPM) do indeed indicate that biomass fell below the biomass target B_{TARGET} (*SB/SB_{MSY} =1*) in the years 2007 – 2009. However, given that there is variability in the stock-recruitment relationship, in practice stock biomass will fluctuate above and below the equilibrium B_{MSY} level when fished at F_{MSY}. Therefore, if F_{MSY} is set as a target, which it is, it **is** problematic to also set B_{MSY} as a limit because the latter will be exceeded 50% of the time. Instead the biomass limit that corresponds to F_{MSY} should be lower than B_{MSY} by an amount that depends primarily on recruitment variability and estimation error (Restrepo 2008, Red, Green and Yellow: Thoughts on stock status and the ICCAT convention objectives. SCRS, 172, 1–11). For this stock IOTC has set an (interim) limit of 0.4 B_{MSY}. If a stock's biomass falls between B_{MSY} and an adequate B_{LIM}, while being fished at F_{MSY} or less, it will likely be within safe biological limits; that is recruitment is unlikely to be impaired.

- From the Report of the 16th Scientific Committee we have these notes:
  "it is difficult to know whether the stock is moving towards a state of being subject to overfishing."
  "annual catches of yellowfin tuna should not exceed the lower range of MSY (300,000 t) in order to ensure that stock biomass levels could sustain catches at the MSY level in the long term. Catches have exceeded this level in 2011 and 2012"
  "The current assessment indicates that catches of about the 2010 level are sustainable, at least in the short term" (Catches since 2010 have been in excess of 2010 levels and it is not known with any certainty what effect this is having on current spawning biomass.)
  The report of the 16th Session of the Working Party on Tropical Tunas further notes that catches in 2013 also exceed the recommend catch by approximately 17%, also noting that recruitment estimated by MFCL is considerably lower than the whole time series average and catches below MSY would be needed to maintain stock levels.
  "The problems identified in the catch data from some fisheries, and especially on the length frequencies in the catches of various fleets, **a very important source of information for stock assessments**. Length frequency data is almost unavailable for some fleets, while in other cases sample sizes are too low to reliably document changes in abundance and selectivity by age"
  IOTC are still evaluating periods of recruitment to feed into assessment models, attempting to overcome data deficiencies. "The resulting estimates of MSY (380,000–450,000 t) are considerably higher than levels of catch sustained from the fishery and are considered to be overly optimistic. Similarly, the corresponding **estimates of stock status are considered to be highly uncertain or unreliable**."
  RESPONSE: The most recent report on the status of this stock considered all of these issues and concluded that, on the weight-of-evidence available in 2014, the yellowfin tuna stock is determined to be not overfished and not subject to overfishing.

- With lag of several years in assessments and reported increasing levels of fishing effort, there is no way to state with the required level of certainty the current situation. In the light of the number of years that have passed since the last full stock assessment, the poor quality of data available to stock assessment scientists, and the uncertainties inherent in the models being used based on the available data, we do not feel the assessment team has provided strong enough justification for a 100 score, a score that is earned only in the most exemplary fisheries.
- Finally we note that although the PI refers to the current status of the stock, all the CAB's rationale for their scores are based on projections forward from the last stock assessment, several years ago. We do not see how they can arguably claim to have knowledge, at greater than 95% confidence level, of the current status of the fishery based on their projections of old stock assessments of a heavily fished stock.
  RESPONSE: Every stock assessment is based on data in the years preceding the assessment and it is now quite normal in many RMOs to undertake assessment at intervals of more than 1 year. ICCAT for example, carries out full assessments of stock every 3 – 5 years. Thus the 'lag of several years' while true is not exceptional or unusual. It should be noted that the scientific committee does do a full review/update using available data on an annual basis.

SG100 There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its reference point, over recent years.

The current estimate of SB2010/SBMSY = 1.24 [0.91– 1.40]. And while the ASPM model run indicates that the target reference points may have been exceeded during the period of high catches in the mid 2000's (2003–2006), the WPTT agreed that the MFCL assessment, which indicates that fishing mortality is below the limit and target reference points during the whole time series, represents the best view of the stock. Also there is a low risk of exceeding the SBMSY in the next 6 years if catches are maintained at 2010 (8.3 % risk that SB2020 < SBMSY). However the risk that F2020 > FMSY = 8.3). Hence there is a "high degree of certainty" that the stock has been above the MSY reference points in recent years. Thus, this meets SG100.

There is no evidence that the team has considered the biology of the species and the scale and intensity of both the fishery and management system and other relevant issues in determining relevant time periods over which to judge fluctuations. (MSC CR CB2.2.2).
RESPONSE: The 'relevant time periods over which to judge fluctuations' is not applicable in this case (MultifanCL assessment) as this stock has been above its reference point, over recent years; the second option available at the SG 100 level. For the ASPM model, this demonstrates that while the stock did fall below the target SB_{MSY} between 2006 and 2009, the fishing pressure fell during each of these years and the stock returned to a level greater than SB_{MSY} in 2010 and 2011. In the ASPM Kobe plot this 'fluctuation around its target reference point' is abundantly clear.

We do not feel that a generally unidirectional decline in stock abundance over many years, with a possible dip below B_{targ} and a return above B_{targ}, attributed by the IOTC Scientific Committee mainly to the exclusion of fishing vessels by piracy, rather than effective management of the stock is sufficient justification for a 100 score.
RESPONSE: The 'unidirectional decline in stock abundance' is, rather, a trajectory of biomass toward *the chosen target for this fishery, namely;* $SB/SB_{MSY} = 1$ *that is MSY.* This is consistent with the management strategy for the fishery, where, in a long term sense, SB_{MSY} is the expected average biomass that will result from fishing constantly at F_{MSY} (the chosen target).

- The intent of this scoring issue is to demonstrate the sustainability of a stock through appropriate management practice over a relevant time period. The rationale provided by the assessment do not support this, in fact demonstrating a fishery in steady decline under increasing fishing pressure with no management system in place to address the decline. It is understood that future audits may have this to address should the situation continue the trend, following IOTC Scientific Committee projected stock trajectories.
  RESPONSE: Again, the 'unidirectional decline in stock abundance' is, rather, a trajectory of biomass toward *the chosen target for this fishery*. According to the most recent assessment fishing pressure has *declined* each year since 2005 to most recent year estimated, 2010 (ASMP) and each year since 2008 to most recent year estimated, 2010 (Multifan-CL).

- At SG100 the team shall present evidence that the stock has fluctuated around the target reference point for longer periods (than demonstrated for SG80). We do not feel sufficient evidence has been provided for the current stock status (noting the length of time since the last assessment). We do not have a defined longer period of time than that in SG80, we do not have a defined period of time in SG80 either.
  RESPONSE: the SG100 requires that there is a high degree of certainty that the stock has been a) fluctuating around its target reference point, **or** b) has been above its reference point, over recent years. The two assessment results presented by the scientific committee indicate clearly that in the case of the Multifan-CL model the stock has been has been above its reference point, over recent years. The ASPM demonstrates that while the stock did fall below the target SB_{MSY} between 2006 and 2009, the fishing pressure fell during each of these years and the stock returned to a level greater than SB_{MSY} in 2010 and 2011. In the ASPM Kobe plot this 'fluctuation around its target reference point' is abundantly clear.

PI 1.2.1 There is a robust and precautionary harvest strategy in place.

SG80 The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.

RESPONSE: While accepting that there is no formally agreed Harvest strategy the argument detailed in section 3.3.3.5 of the report remains valid. Namely that in resolution 12/01 the IOTC agreed to apply the precautionary approach in accordance with relevant internationally agreed standards, in particular with the guidelines set forth in the UNFSA, and to ensure the sustainable utilisation of fisheries resources as set forth in Article V of the IOTC Agreement. Further, in applying the precautionary approach, the IOTC has agreed:

1. That the Commission shall adopt, after due consideration of the advice supplied by the IOTC Scientific Committee, a) stock-specific reference points (including, but not necessarily limited to, target and limit reference points), relative to fishing mortality and biomass, and b) associated harvest control rules, that is, management actions to be taken as the reference points for stock status are approached or if they are breached.

2. That reference points and harvest control rules shall be determined so that, according to the best available science, the risk of a negative impact on the sustainability of Indian Ocean resources of tuna and tuna-like species is minimised.

3. That in the determination of appropriate reference points and harvest control rules, consideration must be given to major uncertainties, including the uncertainty about the status of the stocks relative to the reference points, uncertainty about biological, environmental and socio-economic events and the effects of fishing activities on non-target and associated or dependent species.

4. That if an unanticipated event, such as a natural phenomenon has a significant adverse impact on the status of a stock or its associated environment, the Commission shall adopt Conservation and Management Measures on an emergency basis to ensure that fishing activity does not exacerbate such adverse impacts.

5. That initially and as an interim measure, the Commission may adopt provisional reference points and harvest control rules, taking into account the advice of the IOTC Scientific Committee; such measures would remain current until such time as the Commission chooses to update them.

6. That it will instruct the IOTC Scientific Committee to assess, through the management strategy evaluation process, the performance of reference points, including any interim reference points, and of potential harvest control rules to be applied as the status of the stocks approaches the reference points.

7. And that after completion of the management strategy evaluation, the IOTC Scientific Committee should provide the Commission with recommended reference points for all major stocks, and cast future advice on the status of the stocks relative to the adopted reference points, on the basis of the best available scientific evidence.

8. Finally, that the IOTC Scientific Committee will report on the progress of the management strategy evaluation process

Given that resolution 13/10 set interim target (BMSY and FMSY) and limit (BLIM = 0.50 BMSY and FLIM = 1.30 FMSY) reference points, then resolution 12/01 may be taken to provide context for an overall harvest strategy including the intention that management responses ultimately be guided by HCRs once determined using MSE. For example, the 12/01 framework specifies that consideration must be given to major uncertainties, including the uncertainty about the status of the stocks relative to the reference points, uncertainty about biological, environmental and socio-economic events and the effects of fishing activities on non-target and associated or dependent species and that if an unanticipated event, such as a natural phenomenon has a significant adverse impact on the status of a stock or its associated environment, the Commission shall adopt Conservation and Management Measures on an emergency basis to ensure that fishing activity does not exacerbate such adverse impacts.

The overall effect, therefore, of resolutions 12/01 and 13/10 is to provide interim elements of the final harvest strategy that are clearly intended to ensure that the stock is maintained around the target reference points (BMSY and FMSY).

In that sense then, the intention of resolutions 12/01 and 13/10 are consistent with appropriate management; they provide a framework that is well known from other fisheries where it has proven effective. There is no reason to believe that it would be any less effective here if strictly applied.

Similarly, scientific advice has been formulated relative to a harvest strategy which is, in turn, relative to MSY reference points. This is responsive to that state of the stock and to limit and target reference points commonly used for bigeye and other tropical tunas, meeting the SG80. However, because the strategy is not clearly defined but, rather is "implied." and it is unclear whether the harvest strategy will be successful. Therefore, the designed aspect of the strategy to change overall selectivity cannot be given full credit in the assessment.

SG80 The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.

RESPONSE: It is clear from the most recent reports of the IOTC Scientific Committee that while a harvest strategy may not have been fully tested, none the less, monitoring is in place. Further it is evident from the most recent report on the status of this stock that having considered all of issues the scientific committee concluded that, on the weight-of-evidence available in 2014, the yellowfin tuna stock is determined to be **not overfished and not subject to overfishing**. Further the Scientific Committee estimated the SB relative to its target, SB_{MSY} and determined that

SB_{cur}/SB_{MSY} (80% CI) yellowfin = 1.24 (0.91 – 1.40) and for ASPM 1.35 (0.96 – 1.74)

while F relative to its target, F_{MSY} was determined as

F_{cur}/F_{MSY} (80% CI) yellowfin = 0.69 (0.59 – 0.90) and for ASPM 0.61 (0.31 – 0.91).

On the basis of the foregoing the Scientific Committee of the IOTC has determined that the stock clearly **does** meet its management objectives.

Further whereas the ASPM model indicates that F exceeded its target in two years (2004 and 2005), immediately thereafter it reduced and by 2007 was once again within its target, where it has remained.

During the reference period 2006 – 2013 the amount of 'active capacity' present within the IOTC was reduced by more than 10%

PI 1.2.2 there are well defined and effective harvest control rules in place

SG60 Generally understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.

RESPONSE: The assessment team accepts that Harvest control rules for this stock are not explicitly well-defined, nor is there a specific plan of control if the stock size falls below the trigger point (MSY). That being said there is clear evidence of an intention to 1) end overfishing and 2) to rebuild this stock should depletion occur and the scientific committee is explicitly called on to provide such advice.

In these cases we contend that there are g*enerally understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached*.

1. In each case the harvest strategy incorporates target reference points (SB_{MSY} and F_{MSY}) as well as interim limit reference points. These are set in resolution 13/10: interim target reference points, B = B_{MSY} and F = F_{MSY}; and interim limit reference points, e.g. for yellowfin, B_{LIM} = 0.50 B_{MSY} and F_{LIM} = 1.30 F_{MSY}.

2. It is clear from resolution 12/01 that these reference points are recognised by IOTC. Resolution 12/01 establishes this: "*initially and as an interim measure, the Commission may adopt provisional reference points and harvest control rules, taking into account the advice of the IOTC Scientific Committee; such measures would remain current until such time as the Commission chooses to update them*. In other words once resolution 13/10 was agreed the provisional reference points and HCR *remain current.*

3. This is further evidenced by the report of IOTC Scientific Committee which reports annually on the performance of the stock against these metrics:

   SB_{cur}/SB_{MSY} (80% CI) yellowfin = 1.24 (0.91 – 1.40) and for ASPM 1.35 (0.96 – 1.74)

   F_{cur}/F_{MSY} (80% CI) yellowfin = 0.69 (0.59 – 0.90) and for ASPM 0.61 (0.31 – 0.91).

4. Other aspects of the implicit harvest strategy are also established in resolution 12/01. The resolution states that "*the IOTC agreed to apply the precautionary approach in accordance with relevant internationally agreed standards, in particular with the guidelines set forth in the UNFSA, and to ensure the sustainable utilisation of fisheries resources as set forth in Article V of the IOTC Agreement".* Therefore both the target and limit reference points, notwithstanding that they are interim until otherwise changed, nonetheless have the meaning established in '*relevant internationally agreed standards', 'the guidelines set forth in the UNFSA',* and are intended to *'ensure the sustainable utilisation of fisheries resources as set forth in Article V of the IOTC Agreement'.*

5. UNFSA sets a general intention on limit and target reference points as well as providing some guidance for the limit. "*Limit reference points set boundaries which are intended to constrain harvesting within safe biological limits".* Safe biological limits are interpreted as relating to highly undesirable states that are irreversible or slowly reversible, such as impaired recruitment (recruitment fishing). Avoiding irreversible or slowly reversible impacts in the context of uncertainty is also the objective in applying the Precautionary Approach.

6. A general target in UNFSA is to "*maintain or restore stocks at levels capable of producing maximum sustainable yield*" while also recognizing uncertainty in understanding and variability of biological systems. The associated target is recognised as being a management related issue. Thus, the overall all intention is to maintain the highest long-term average catch (the target) with a low chance of being outside safe biological limits (the limit).

7. It is quite clear that *to apply the precautionary approach in accordance with relevant internationally agreed standards etc* the IOTC is bound to take steps to restore the biomass of this stock to B_{MSY} (its current – until otherwise updated - target biomass) and, the fishing pressure on the stock should, *on average* be F_{MSY} (its current – until otherwise updated - target F).

8. Likewise it is clear that *to apply the precautionary approach in accordance with relevant internationally agreed standards etc* the IOTC is bound to take steps to avoid the biomass of this stock falling below B_{LIM} (its current – until otherwise updated - limit biomass) and, the fishing pressure on the stock exceeding F_{LIM} (its current – until otherwise updated - limit F).

9. Similarly if an unanticipated event, such as a natural phenomenon has a significant adverse impact on the status of a stock or its associated environment, the Commission is required to adopt Conservation and Management Measures on an emergency basis to ensure that fishing activity does not exacerbate such adverse impacts.

10. It is a fact too that the IOTC has introduced a number of measures to 1) manage the fishing capacity (effort management) and 2) close specific areas to fishing.

11. Fishing capacity was reduced by 10% between 2006 and 2013

    RESOLUTION 14/02 recognising that during the 12th IOTC scientific meeting the IOTC Scientific Committee recommended that yellowfin tuna and bigeye tuna catches should not exceed the MSY levels which have been estimated at 300,000 tonnes for yellowfin tuna and at 110,000 tonnes for bigeye tuna; adopted, in accordance with the provisions of Article IX, paragraph 1 of the IOTC Agreement, a resolution (14/02) wherby CPCs **shall** implement an action plan to e**stablish an allocation system (Quota) or any other relevant measures based on the IOTC Scientific Committee recommendations for the main targeted species under the IOTC competence;**

12. Finally it is evident from the current report of the scientific committee that this strategy is being complied with and the most recent report concludes "on the weight-of-evidence available in 2014, the yellowfin tuna stock is determined to be not overfished and not subject to overfishing"

Thus it remains the case that there are *generally understood harvest control rules* in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.

SG60 There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.

RESPONSE: Whilst noting all of the points raised it remains the case that there is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation. In its most recent assessment the scientific committee have determined that "on the weight-of-evidence available in 2014, the yellowfin tuna stock is determined to be not overfished and not subject to overfishing". In coming to this conclusion the scientific committee estimated the SB relative to its target SB_{MSY} and determined that SB_{cur}/SB_{MSY} (80% CI) yellowfin = 1.24 (0.91 – 1.40) and for ASPM 1.35 (0.96 – 1.74) while F relative to its target, F_{MSY} was determined as F_{cur}/F_{MSY} (80% CI) yellowfin = 0.69 (0.59 – 0.90) and for ASPM 0.61 (0.31 – 0.91). That external factors, for example, piracy, partially explain this present situation is not relevant. What is relevant is the inappropriate conclusion that *because* piracy partially explained the current situation that the reverse is true, *i.e.* had there ***not*** been piracy and ***had*** the biomass of the stock fallen below its target or had the fishing intensity exceeded its target that IOTC would ***not*** have acted appropriately. In resolution 12/01 the IOTC agreed *"to apply the precautionary approach in accordance with relevant internationally agreed standards, in particular with the guidelines set forth in the UNFSA, and to ensure the sustainable utilisation of fisheries resources as set forth in Article V of the IOTC Agreement".*

In addition RESOLUTION 14/02 recognising that during the 12th IOTC scientific meeting the IOTC Scientific Committee recommended that yellowfin tuna and bigeye tuna catches should not exceed the MSY levels which have been estimated at 300,000 tonnes for yellowfin tuna and at 110,000 tonnes for bigeye tuna; adopted, in accordance with the provisions of Article IX, paragraph 1 of the IOTC Agreement, a resolution (14/02) wherby CPCs **shall** implement an action plan to e**stablish an allocation system (Quota) or any other relevant measures based on the IOTC Scientific Committee recommendations for the main targeted species under the IOTC competence;**

PI 1.2.3 Relevant information is collected to support the harvest strategy

SG80 There is good information on all other fishery removals from the stock.

RESPONSE In relation to all 3 stocks the scientific committe has reported that retained catches are either generally well known or thought to be wll known for the major fleets. That they are 'less certain' for some coastal or specific fleets is not the same as saying there is NOT good information on all other fishery removals from the stock. On the contrary most fisheries have data gaps and it is costomary to address such gaps statistically or through other external data including trade data etc.. What is most important is that overall there is good infomation on all other fishery removals as indicated by the scientific committee.

RESOLUTION 14/02 recognises that the tuna artisanal fisheries sector needs strengthening in terms of catch statistics reporting in order to more closely follow the catch situations and notwithstanding improvement in the industrial fishery catch statistics reporting requirements; adopted in accordance with the provisions of Article IX, paragraph 1 of the IOTC Agreement, the following:
1. CPCs shall implement the following action plan:
a) Establishment of an allocation system (Quota) or any other relevant measures based on the IOTC Scientific Committee recommendations for the main targeted species under the IOTC competence;
b) Advise on the best reporting requirement of the artisanal tuna fisheries and implementation of an appropriate data collection system.

P2 response

The report does not address the question of spatial separation or proximity between "free school" and FAD sets. The definition of each type of set implies that free school set are not made in association with FADs by definition.

Comments related to Section 3.4.1

The first comment questions the statement in the report that it is possible that the specific mix of tuna (and size grade) leads to occasional discarding of the entire catch. All evidence available to the team is that this is a rare occurrence and overall volumes of tuna discarded in this manner are negligible. This is an unfortunate use of the word "discard". These fish are usally released alive from the purse seine when it is determined that there are suitable for retention. As the catch is not brailed aborad the fishing vessel, they are not technically discarded. The assessment report clearly describes this release process, and notes that the survival of released fish is high.

The available data on the catch distribution of the Echebaster purse seine fleet has been presented in this report. It is adequate, but will be better in the future due to the proposed enhanced observer program,

With regard to sharks, as noted in the WWF comment, Figure 3.4.1 present the total bycatch of sharks and other species, however the more important question for the comparison is the rate of bycatch for free school and FAD sets. The text of section 3.4.1 clearly notes that Delgado de Molina *et al* (2005) and Sarralde *et al* (2006) analyse bycatch rates in both freeschool and FAD sets using purse seine for the Spanish Indian Ocean fleet, based on data obtained over 336 fishing days and 11 fishing trips between 2003 and 2004. The study findings are consistent with those of Amande *et al* (2008) and also indicate that freeschool sets generally result in very low levels of bycatch, by both weight and numbers.

With regard to the stock status of sharks and billfish bycatch species, note that in the MSC scoring, these are referred to as minor retained species because of their very low percentage of the catch, unless they are considered ETP species. As such, they have been scored appropriately in the report.

The text of the report states that the majority of the incidental capture is associated with the FAD based fishery (Amande *et al.,* 2008). The majority of billfish are either discarded dead (65%) or retained for consumption (20%). A small number estimated to be 7% are released alive. Note that this statement is based on the Amande et al reference. The report also states that in the Echebaster free school pruse seine fishery almost all the catch in retained and processed, other than very large sharks and marine mammals (ETP species).

As with sharks and billfish, the catch of rays and the stock status of ray are referred to as minor retained species because of thier very low percentage in the catch, unless they are considered ETP species. As such, they are scored appropriately in the assessment.

With regard to that comment concerning P1 scores for the tuna stocks meeting the SG80, and since the main retained species are the same as the target species, therefore the score for PI 2.1.1 is also 80. This follows the MSC guidance. The minor retained species include albacore tuna, and it is indicated in the text of section 3.4.1 that the albacore stcok is primarily fished by the longline fishery, and in the most recent IOTC stock assesmnet, it was concluded that the stock in experiencing overfishing, $F/F_{MSY}>1$. The draft report text has been edited to clarify this situation.

The comment regarding YFT stocks recovering due to priacy, whereas previous assessments indicated YFT as over-exploited. The text in the report is not as clear, and was edited as follows. . "The previous assessments had indicated that yellowfin tuna stocks were heavily exploited but, possibly as an indirect result of piracy in the western Indian Ocean. This affected both purse seine and longline targeting and the resulting catches, The stock has since recovered."

The comment regarding the SICA analysis for data deficient fisheries specifies an issue relating to the number of gillnet operations and purse seine FAD fisheries operating in the IOTC area and the further states that there should be a more robust strategy and management plan for sharks. Unfortunately, the relation between the comment, the issue, and ultimately the scoring of PI 2 is not clear, so FCI can not respond.

The commentor offers a suggestion that the adoption of harvet control rules and reference points along with a ban on discards of YFT, BET and SKJ measure should be considered as a condition for certification. The report clearly states that in section 3.4.1 that YFT, BET, and SKJ tuna are not

discarded. In fact that is why they are considered under retained species. Admittedly, on rare occasion some tuna are released alive if it is discovered that a set of the purse seine has resulted in a catch of tuna that are too small, however as noted previously these tuna are not brought aboard the fishing vessel, and are released alive. With regard to the suggestion that there be a harvest control rule and reference point for these species, conditions 1-6 specifically address the reference points and harvet control rule issue for YFT, BET, and SKJ.

The commentor questions the statement that the Echebaster fishing fleets have observers on 100% of its vessels? It has made made clear in the assessment report that the Echebaster tuna purse seine boats have 100% observer coverage. There is an issue indicated following this comment related to a report from the chair of the working party, but this does not make sense, so FCI can not provide a response.

Finally the commentor offeres another suggestion related to ecosystem issues, and indicates that there be some effort to limit the capacity for fisheries. In fact this is considered indirectly with precautionary management that seeks to match fishing effort and the resulting mortality with the capacity of the stock to provide sustainable yield.

P3 response

PI 3.1.2 SG 80 b

According to the commentary on the jumbling language, paragraphs referenced have been rewritten as follow:

Original text: “The information for management system is provided for each part agrees to protocols and rules of the organization. Riverine countries to seek and accept relevant information, including local knowledge to nourish the management system.”

New text: The necessary information that feeds Management System is provided by the countries that constitute the IOTC according to protocols and rules of the Organization. Coastal countries take into account all relevant information for the management of the fishery and include local knowledge.

Original text: The management system demonstrates consideration of the information obtained specially with scientific information. The scientific report is based in the best scientific information available but this is not the case with other information as socioeconomic issues between others.

New text proposed: The management system takes into account existing information about the status of the fishery including the best scientific information available. However, not always socio-economic information is analyzed and included in the management system regularly.

PI 3.1.2 SG80 c

According to the commentary on the jumbling language, paragraphs referenced have been rewritten as follow:

Original text: IOTC done the opportunity for participation in key meetings for all interested and affected parties involves in the fishery but not all the parties are interested in participating actively.

New text proposed: IOTC gives the opportunity for all stakeholders involved in the fishery to participate in key meetings. However, not all parties are interested to participate actively

PI 3.1.3 SG80 a

Agree with MSC CR CB4.4.1: The team shall interpret management policy to mean outside the specific fishery under assessment (i.e. at a higher level or within a broader context than the fishery-specific management system).

Therefore, the CAB considers that, in the context of the overall policy of management of the fishery, there are long-term management objectives in accordance with what is established in MSC CR CB4.4.1

This is not related to the fact that currently reference points and harvest control rules of the three species considered not reach the minimum of SG80 in the evaluation of the principle 1. The IOTC, through resolution 13/10 considered the need to establish reference points and Control harvest rules from an interim reference point identified

Therefore, the mechanism of management of the fishery itself provides the necessary measures to establish long term objectives (RP and HCR) for the management of the same, according to the MSC criteria.

The same way, through the IOTC Resolution 12/01, is established as management policy of the Organization, the adoption of a precautionary approach to the management of the fishery and the need for RP and set according HCR the advice of scientists

PI3.2.2 a

According to the commentary on the jumbling language, paragraphs referenced have been rewritten as follow:

Old text: The fishery-specific management system has established decision-making processes that result in measures and strategies to achieve the fishery specific objectives. IOTC Rules and procedures specified the mechanism for each member can vote to adopt news measures and strategies. If well, some decisions are obtained for consensus because non-contracting parties cannot vote but are stakeholders involved in the fishery.

SFA has established decision making processes that result in measures and strategies to achieve the fishery specific objectives if well, the measures and strategies for this fishery are approved within IOTC. For this, SFA has 4 sections directly involve with implementation of IOTC resolutions. The channel among IOTC and SFA is fast and clean.

New text proposed: The specific management system for this fishery has established decision-making processes that result in measures and strategies to achieve specific objectives. The rules and procedures of the IOTC establish the mechanisms by which each member may vote to adopt new measures and strategies, as well as, approval, objection procedure, implementation and compliance.

In reference to National context, the Government of Seychelles, through SFA, has a long-term policy of for the fishing industry based in the "promotion of sustainable & responsible fisheries development & optimization of the benefits from this sector for present and future generations". The SFA works in close collaboration with Ministry Natural Resources, Ministry of Environment and Energy, Seychelles Coast Guard, Seychelles Ports Authority, other Government institutions, fishermen and boat owners associations, NGO's as well as overseas partners. Stakeholder consultations are held on a regular basis regarding the development of the sector.

New text added to clarify the rationale:

In IOTC context, from the available scientific information, the process of decision making is organized as follows:

- Report of the Scientific Committee is circulated to all Members, who initiate a period of internal consultation with their scientists
- Recommendations are considered and translated, when necessary, to proposals for CMMs
- Briefings are prepared by national administrations (internal consultation), to define the positon of the delegations on various maters
- Necessity for action on other areas (e.g. Compliance, combat of IUU fishing) are also included in the briefings consolidating the positon of the national delegations
- At the Annual Session, maters are raised and negotiated seeking, when possible, consensus in the action
- Binding Resolutions are adopted during the Session, as well as non-binding recommendations

There are two Types of Decisions (Article IX):

- Recommendations (voluntary and/or transitional)
- Resolutions (binding) – after 120 days following the Executive Secretary's notification

Approval Process:

- Consensus process or majority consensus approach
- Voting Process – two thirds majority of those present and voting
- Voting Process (Rule IX of Rules of procedure)
- Show of hands

- By roll call (requested by a member)
- Secret ballot (requested by a member and seconded by another member)

Objection process (Article X)

- Any member of the Commission may, within 120 days object to a Management measure and shall not be bound by the measure.
- Any other member may within 60 days from the expiry of the 120 days object to any management measure
- If objections to a measure adopted under above is more than a 1/3, the other members shal not be bound but shall not preclude any other members from giving it effect.
- Any member can withdraw its objection and be bound by the measure at any time.

- Implementation and compliance:
  - Upon return from the Annual Session, each delegation briefs higher authorities on the outcomes
  - The ned for changes in the domestic legislation arising from any agreed measure is evaluated, and action is taken to modify legislation as necessary
  - Contacts are established with other agencies and institutions that could be responsible for implementation of some of the actions (e.g. Port Authority, provincial authorities)
  - Meeting with stakeholders are scheduled to brief them on the outcomes of the Commission Session and their consequences at the domestic level
  - Monitoring and reporting of activities to the IOTC
  - Secretariat proceeds inter-sessional according to the agreed schedule of reporting
  - Level of compliance is indicative of the effectiveness of the Commission

PI3.2.2 b

Old text: IOTC decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation and are through of their Resolutions. These Resolutions are based in the best scientific information available. The decision making is transparent. IOTC resolves most disputes at its annual meetings by consensus.

The Decision-making processes in Seychelles responds to serious and other important issues, but not on all issues. Research, Monitoring, Control and Enforcement, Fisheries management and evaluation and information are the main issues included in SFA responsibilities.

New text proposed: The difficulty to rate this SI is based on the effective implementation of resolutions and recommendations adopted within the IOTC by all parties.

The mechanisms of the IOTC support the conclusion that all issues identified in the fishery are taken into account in the decision making process.

However, effective implementation of the same does not always occur at 100%. The IOTC is able to respond effectively to all problems arising from the management but the degree of implementation is not always complete.

Therefore, we do not consider this SG reaches the PI 100 but if the SG80 according to the provisions of MSC CR CB4.8

For the Europe Union Seychelles and it is considered that the decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions but not the case for all parts of the IOTC and therefore this SI only reaches SG80

PI3.2.2 c

The IOTC has repeatedly stressed the importance of using best available scientific information, in conjunction with sound and clear scientific advice in support of the IOTC decision making process for

the conservation and management of tuna species. IOTC use the best scientific information as basis for making decisions and to elaborate the management fishery Resolutions.

We believe that the decision-making process IOTC is always based on the best scientific information available. The application of the precautionary principle should be considered from the IOTC Resolution 12/01.

Resolutions 12/01 on the implementation of the precautionary approach and 13/10 on interim target and limit reference points and a decision framework, make possible the implementation of the precautionary approach thanks to the adoption of interim target and limit reference points.

Different Resolutions and recommendation were adopted within the IOTC, from Resolution 12/01, which refers to the application of this principle.

- Resolution 14/02 For the conservation and management of tropical tunas stocks in the IOTC area of competence
- Resolution 14/03 On enhancing the dialogue between fisheries scientists and managers
- Resolution 13/04 On the conservation of cetaceans
- Resolution 13/05 On the conservation of whale sharks (Rhincodon typus)
- Resolution 13/06 On a scientific and management framework on the Conservation of sharks species caught in association with IOTC managed fisheries
- Resolution 13/08 Procedures on a fish aggregating devices (FADs) management plan, including more detailed specification of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species
- Resolution 13/09 On the conservation of albacore caught in the IOTC area of competence
- Resolution 13/10 On interim target and limit reference points and a decision framework
- Resolution 13/11 On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna and non-targeted species caught by purse seine vessels in the IOTC area of competence

Conditions response

Condition 2

CAB: By year 4: An appropriate Harvest Control Rule should be tested and agreed by IOTC. Issue: The 'should' must be a 'shall', otherwise the entire condition becomes non-mandatory and may be essentially ignored by the fishery.

Response: Agreed, the 'should' is changed to shall.

Ccndition 7. The commentor notes that the assessment report states that observer coverage for the Echebaster fishing fleet is 100%, but in an IOTC report the level of observer coverage for years 2010-2013 is indicated at 0%. The WWF suggests that a first year milestone for this condition be that the level of observer coverage be reported. The assessment team agrees that this is a reasonable request, and the text of the report for this condition has been edited to include this requirement.

General comments response

The justification text for the PI issue scoring has been edited throughout the report to specifically relate the facts presented in the text to the elements in the Scoring Guideposts (SGs).

From: John Burton (IPNLF) [mailto:john.burton@ipnlf.org]

Sent: 19 January 2015 11:24

To: FCI Fisheries

Cc: Emily Howgate (ipnlf)

Subject: Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna fishery

Dear Sirs,

Please find herewith our letter and attachments regarding the public comment draft report of the Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna fishery.

I would be grateful if you could confirm safe receipt.

I look forward to hearing from you in due course.

Kind regards,

John

John Burton

Chairman

IPNLF
INTERNATIONAL POLE & LINE FOUNDATION

From: Carol Leiper

Sent: 20 January 2015 10:09

To: 'john.burton@ipnlf.org'

Subject: FCI to JB - Acknowledgement of Comments on PCDR - EIOtuna 20 01 15

Food Certification International Ltd

Findhorn House, Dochfour Business Centre, Dochgarroch, Inverness, IV3 8GY, UK

Tel: +44(0)1463 223 039 Fax: +44 (0)1463 246380 www.foodcertint.com

Dear Mr Burton

FCI would like to acknowledge receipt of your comments on the Public Comment Draft Report for this fishery assessment and thank-you for your input.

Your comments have been passed to the assessment team for this fishery and are currently being considered in light of the points that you have raised.

We will come back to you on this as soon as we can.

If you do not wish to be kept informed of the progress of this fishery assessment, please contact FCI and we will remove your details from the stakeholder list.

Kind regards.

Fisheries Department

FCI is a Specialist Division of Acoura Tel: +44 (0)1463 223 039

Fax: +44 (0)1463 246 380

Email: fisheries@foodcertint.com

Food Certification International Ltd

Findhorn House

Dochfour Business Centre

Dochgarroch

Inverness IV3 8GY

www.foodcertint.com

IPNLF
INTERNATIONAL POLE & LINE FOUNDATION

Dear Sirs,

Review of Draft Report on Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery

I am writing on behalf of the International Pole and Line Foundation, a Stakeholder in this process, setting out our concerns regarding the PCDR and the recommendation to certify the fishery.

Our impression is that the team has been selective with evidence to support certification. The report is poorly written and repeatedly states that evidence supports its position but then does not identify that information. It makes many general statements about bycatch being minor, or impacts being insignificant, when other authors might have said the opposite.

Furthermore we find it most surprising that the CAB has ignored the views of the Peer reviewers in reaching their conclusion that the fishery should be certified.

Unfortunately we have found the MSC template section 5 for Stakeholder input to be unusable therefore our detailed comments are set out below in the body of this letter.

Major Concerns

We have major concerns in relation to units of certification and P3, which in our opinion should lead to the process being nullified and/or failure of the assessment, a) and b) below.

a) Units of Certification.

1. The Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery is the fishery under assessment.

2. MSC CR 1.3 Para 27.4 covers *Confirmation of Scope* and the Unit of Certification is described under para 27.4.2 *The CAB shall confirm the proposed unit of certification for the assessment to include: 27.4.2.1 The target stock (s); 27.4.2.2 The fishing method or gear, and 27.4.2.3 Practice (including vessels) pursuing that stock.*

3. Para 27.4.3 states that "*The CAB shall note that once defined, the unit of certification cannot be changed during the assessment unless: 27.4.3.1 The CAB submits a variation request to this requirement to MSC by following the procedure set out etc*".

4. The announcement on the MSC web site dated 22 January 2013 http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/indian-ocean/echebastar_indian_ocean_purse_seine_skipjack_yellowfin_and_bigeye_tuna/assessment-downloads-1/20130122_AAMNT_ANMT_TUN393.pdf] lists 6 units of certification.

5. Clarifications to the UoC were posted on the MSC web site on 31 October and 6 November 2013. These continued to define 6 UoC – three each for FAD and free school sets.

6. No variation request has been posted to change the UoC as would be required by CR 27.4.3.

1 Lander Street, Reading, RG1 4QW, United Kingdom
Registered Charity no. [illegible]

2nd Floor, Kanakia Wells, Kurnool Greens, Malad [illegible]
Registered Charity no. [illegible]

info@ipnlf.org www.ipnlf.org

7. PCDR Executive Summary states *"This report provides details of the MSC assessment process for the Pesqueros Echebastar Indian Ocean skipjack, yellowfin and bigeye freeschool purse seine tuna fishery. The assessment process reported on does not include those catches of tuna made that are made using FAD's"*.

8. PCDR Section 3.1 Page 6 states *"This report presents the findings of the assessment team in relation to three Units of Certification that have been entered into assessment. These UoC's are based on purse seine sets made on freeschools of tuna – so called unassociated sets. In this context, sets made on drifting objects or drifting Fish Aggregating Devices (FAD's) are excluded from the assessment and are not reported on"*. Also *"Please note that whilst the Unit of Certification details the full extent of what is being assessed, it is the full and complete Public Certification Report that precisely defines the exact nature of certification for this fishery. This Unit of Certification was used as it is compliant with client wishes for assessment coverage and in full conformity with MSC criteria for setting the Unit of Certification"*.

9. It is clear that the CAB has failed to follow the required process. It is not possible to exclude a UoC without MSC approval of a formal variation request. The CAB has failed to follow the MSC requirements as defined in the CR v1.3.

10. On the basis of the evidence provided the only conclusion possible is that the Echebastar Indian Ocean Purse Seine Skipjack, Yellowfin and Bigeye Tuna Fishery as defined by the CAB in their announcements to stakeholders cannot be certified.

11. The CAB failed to follow MSC CR 27.15.1 *"The team shall include a draft determination on whether or not the applicant will be recommended for certification"*. Accordingly, it is, at best, highly presumptuous to declare *"Following this decision by the assessment team, and review by stakeholders and peer-reviewers, the determination will be presented to FCI's decision-making entity that this fishery has passed its assessment and should be certified"*.

12. On the basis of this the assessment process should be considered null and void.

b) Principal 3

The fishery **fails** the assessment in relation to 3.1.4, 3.2.2 and 3.2.3

3.1.4

1. The PCDR p 97 states *"In reference to EU, currently the European Maritime and Fisheries Fund (EMFF) 10 is the fund for the EU's maritime and fisheries policies for 2014-2020. This fund has, among other goals, helped fishermen in the transition to sustainable fishing. In the past, EU incentives were used to increase capacity through the construction of new fishing vessels. But, currently, this possibility is forbidden"*. The scoring rationale seems to assume that the European Union fleet operating in these fisheries currently don't have economic subsidies except only in some cases for project related to improving fisheries sustainability.

2. It is common knowledge that EU purse seine vessels operating under FPAs in the Indian Ocean pay a lower fee for fishing rights than would have been the case if the licenses had been bought privately. The PCDR does not analyse this situation.

3. There is no analysis of the potential for subsidies related to the FPA.

4. http://fishsubsidy.org/off/?sort=amountTotalPaymentEuro&query=projectDescription%3A%22ELAI ALAI%22 confirms that the vessel Elai Alai received a benefit of €557,928.00 from the EU.

5. http://ec.europa.eu/competition/elojade/isef/index.cfm confirms that in January 2014, Spanish companies, including Echebastar, fishing the Indian Ocean received €1.4 million State aid to guarantee security. The report does not note this payment.

6. In scoring, the CAB fails to respond to the MSC CR *"27.10.6 To contribute to the scoring of any PI, the team shall verify that each scoring issue is fully and unambiguously met. 27.10.6.1 Rationale shall be presented to support the team's conclusion"*.

7. The rationale is far from clear. PCDR p 243 clearly shows that the fishery was not considered to have met PI3.1.4 SIA at SG60 and SG80. As there is only one SI for PI 3.1.4 there is clearly a mistake in the score – based upon the CAB's own rationale, the score should be 60 and not the 75 noted. Applying the correct score would reduce the P3 score from 80.5 to 78.6 implying that the three UoCs would **fail** the assessment.

3.2.2

1. This PI should relate to the decision making processes at the company level, the Seychelles and the EU, including the FPAs. While the main text refers to decision making rules at the EU level, there is no mention of this in the scoring rationale.

2. In scoring SI C at the very least the rationale should refer to EU policy.

3. In scoring, the CAB fails to respond to the MSC CR *"27.10.6 To contribute to the scoring of any PI, the team shall verify that each scoring issue is fully and unambiguously met. 27.10.6.1 Rationale shall be presented to support the team's conclusion"*.

4. The rationale for SID only refers to the IOTC process. There is no justification at the fishery specific level to conclude that the three UOCs meet SG100 (Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity), SG80 (Information on fishery 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) and SG60 (Some information on fishery performance and management action is generally available on request to stakeholders).

5. SI E does not refer to the fishery. The evidence presented means the fishery does not meet SG60 and the fishery **fails** the assessment.

3.2.3

1. We consider that the IOTC has limited relevance to Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with. In fact IOTC does not maintain records of individual vessels of a CPC. In terms of compliance with

the Regional Observer Scheme IOTC is using observer trip reports to monitor whether the 5% coverage of operations/sets is achieved across the gear type by fleet and CPC, not by individual vessel. The observer data are also subject to the confidentiality agreement in Resolution 12/02 so are only publically available in aggregate form without distinguishing individual vessels. These issues will make it difficult to check whether the those Echebastar vessel are fully complying with IOTC regulations

2. In scoring, the CAB fails to respond to the MSC CR "*27.10.6 To contribute to the scoring of any PI the team shall verify that each scoring issue is fully and unambiguously met. 27.10.6.1 Rationale shall be presented to support the team's conclusion*".

3. In our opinion, scoring of this PI should refer explicitly to the records of Echebastar. While there is some coverage of this aspect in the main text there is nothing in the scoring rationale. The evidence presented means the fishery does not meet SG60 and the fishery <u>fails</u> the assessment.

<u>IOTC - SC17</u>

1. We are most surprised that the PCDR was published in advance of SC meeting 17, which took place December 8-12 last year, the dates of this were known back in May 2014.

2. It is widely acknowledged that the IOTC is probably the most poorly managed RFMO for many reasons, one of which being the highest rate of use of FADs. FAD use is out of control.

3. In the IOTC 90% of sets are on FADs, 80% of sets by Echebastar are on Fads and there are no limits of FADs use. The IOTC has a massive problem with growing fleets and over capacity.

4. SC16 reported that fleets fishing for tuna and tuna like species in the Indian Ocean would be 251% over the 2006 base line capacity by 2020.

5. The SC17 noted that:

   "the number of drifting FADs deployed by purse seine vessels has dramatically increased over the past 10 years which may reach around 10,000 monitored in 2013, for the EU and Seychelles purse seine fleets only. This figure does not include the FADs deployed by purse seiner vessels of other fleets, such as Rep. of Korea (4 vessels), Sri Lanka (8 vessels) and Mauritius (6 vessels which entered the fleet in 2014). Efficient strategies have been developed to fish on drifting FADs (e.g. electronic buoys to track the FADs, some of these buoys being equipped with echo sounders for acoustic estimation of biomass around it, the use of support vessels for the monitoring and technical maintenance of FADs and buoys). The use of FADs has increased the fishing efficiency of the fleets using FAD; however, the scientists are still unable to estimate with accuracy the magnitude of this increase, and the impact this has on the distribution and abundance of tuna CPUE standardisation." (paragraph 68)

6. Worrying trends have appeared in the behaviour of tuna, especially Skipjack, which are now virtually caught on FADs in total, with little being caught in free schools. It appears that large numbers of FADs have effectively depressed and fragmented the school formation with their average sizes getting smaller and loss of larger sized skipjack in recent years. (Paragraph 69)

7. There is little data available to assess bycatch and ecosystem impacts of the fishery, in particular with regard to shark bycatch. "*information on retained catches and discards of sharks contained*

in the IOTC database remains very incomplete for most fleets despite their mandatory reporting status, and that catch-and-effort as well as size data are essential to assess the status of shark stocks." (Paragraph 44)

8. Very few members have even developed National Plans of Action (NPOAs) for sharks (12/35) and seabirds (6/35), or even carried out assessments to ascertain if the development of a Plan is warranted. Similarly, few members have implemented the FAO guidelines to reduce marine turtle mortality in fishing operations (6/35). (Paragraph 58)

General Comments

1. Something approaching 80% of the tuna caught by Pesqueras Echebastar is taken in association with FADs. Only about 20% of the catch is from unassociated free-schools. It makes no sense to certify the 20% while effectively turning a blind eye to the 80%. Both exploit the same tuna stocks, and both use the same fishing gear. It is therefore stretching the MSC's own guidelines to treat them separately. In addition, it would be economically unsustainable to fish the 20% without the income generated by the 80%. In other words, the certified 20% would be subsidised by the uncertified 80%. Furthermore, the uncertified, and presumably uncertifiable, 80% would in effect be subsidised by any increased income resulting from MSC certification of the 20%.

2. If certification were granted, there is no clear, unambiguous and verifiable plan in place for the separation of certified and non-certified catch. Traceability is a key issue, and should be addressed prior to possible certification, not tacked on as an afterthought.

3. There are numerous references throughout the report to the legal framework in which the fishery will operate. However, there is scant discussion of compliance, monitoring and enforcement. This is particularly relevant since EU fishing companies have been implicated in fraudulent financial activities and illegal fishing practices in African waters (e.g. EJF, 2012; Greenpeace, 2012; Africa Progress Panel, 2014). It is not sufficient to invoke future aspirations for 100% observer coverage; there needs to be a clear distinction between observer and inspector functions.

4. The report is not very well written, and there are several mistakes and inconsistencies. For example, it talks about the fleet being composed of 'factory processing vessels' and having a 'processing manager ... in charge of fish processing operations' (page 9) and yet the vessels quite clearly 'are not equipped for processing at sea (page 11). As another example, the report states erroneously that tuna catches are 'stored in super chilled sea water brine at temperatures down to -60C' (page 11). These are not especially significant errors on their own, but they do suggest that the report's authors have not taken sufficient care in production of the report and that they do not have a sufficiently detailed understanding of the fishery. The report, page 69, refers to Echebastar data (2008-2012) If this data does exist then for reasons of transparency it should be included in the report.

5. The CAB repeatedly confuses the terms "retained" and "bycatch"

6. Condition 7 notes that Pesqueras Echebastar is carrying one observer per vessel (page 266). However in the body of the report is noted that two observers are required (page 80).

7. The draft report fails to mention interactions with seabirds, some species of which are endangered. The purse seiners frequently locate free-swimming tuna schools by the presence of seabirds (which feed on small fishes and other marine life driven to the surface by the tunas). The PS regularly use special bird radar to locate the seabird flocks. The impact of the PS fishery on the number of tuna schools, and therefore the number of feeding opportunities for seabirds has not been considered in the report. There may be significant impacts on some seabird populations (eg Danckwerts et al, 2014).

Principal 1

1.2.2

1. Nb all comments relate to all species

2. While we would agree with the rationale given here, to support a score of 60, this ignores the latest MSC instruction (MSC CAB Update - 24 November 2014). According to this instruction, the rationale given on the Echebastar fishery is incorrect for all three species. Without reference to CR v2.0 requirements and associated guidance, a score of 60 cannot be maintained for this fishery.

Principle 2 General Comments

1. There is ambiguity with definitions. The report states that it is seeking certification of tuna catches from sets on free-swimming schools (page 6). Later (page 11) it defines freeschool sets as 'those that are made on schools of tuna that are not associated with any floating object'. But it also defines a separate category of unassociated sets as 'those that are not made on oceanic megafauna or within several nautical miles of natural or artificial floating objects'. Later still (page 69) the report states that the assessment considers 'sets made on freeschool (unassociated) schools'. The assessment should presumably be of unassociated free-swimming schools, but this needs to be clarified. This lack of clarity on what the report's authors themselves recognise to be a fundamental point requiring clear definition (page 6) is particularly ironic and reinforces point 4, above.

2. Perhaps more importantly, if Pesqueras Echebastar were allowed to certify tuna catch from any unassociated free-swimming school, then by definition it will not certify any tuna catch that is associated with anything else. Therefore its unassociated free-swimming schools will have no bycatch. That is tautology, not science.

3. Another problem with definitions: the report uses data from the wider purse seine fishery (e.g. Amandé et al., 2008) in its analysis. Those data distinguish FAD sets and free-school-sets, but their free-school-sets include sets associated with whales and seamounts. The report excludes sets associated with whales and seamounts from its definition of free-school-sets. The authors of the report appear to have confused data categories, and as a result the true extent of genuinely free-school-sets is uncertain. It should be pointed out that the SC of the IOTC does not have an agreed definition of 'FAD-caught' fish and 'Free school' fish. Without clear and accepted definitions within the IOTC of FAD-caught and Free School fish recording what is what must be problematic to say the least.

4. Section 5.2 recognises that current levels of traceability/segregation are not sufficient to ensure FAD-caught and unassociated catches are not mixed, and so cannot enter into subsequent chain

6

of custody. However, Section 5.2 allows that entry into CoC may occur with full traceability. As the traceability systems are not defined, they cannot be evaluated by peer reviewers or stakeholders. According to CR 27.12.3, the report should clarify that product is not eligible to carry the MSC label until revised by the CAB at the next re-assessment.

5. The report states that Pesqueras Echebastar is committed to the long term sustainability of Indian Ocean tuna fisheries as 'demonstrated through the companies [sic] active involvement in fisheries research projects aimed at improving the sustainability of the fisheries by reducing levels of overall bycatch through changes to fishing practices, improved data recording, increased transparency ...' (page 1). The report also notes that an observer programme started in August 2013 (page 79) with a commitment to 100% observer coverage on Pesqueras Echebastar vessels by January 2014 (page 78). However, Pesqueras Echebastar apparently has no data on bycatch or even on retained non-tuna species (section 3.4.1). These statements appear incompatible.

6. Sharks. The report states that there are no fishery indicators for silky sharks in the Indian Ocean (page 75). That is not true: there are several CPUE time series indicating consistent declines in relative abundance (e.g. IOTC, 2009). The report does acknowledge that 'oceanic whitetip shark abundance has declined significantly over recent decades' (page 75). The report also cites Coelho et al. (2012) as an example of a paper demonstrating increasing CPUE suggestive of stable or increasing abundance of shark stocks. However, the data of Coelho et al. (2012) is limited to 1999-2011, a period following decades of earlier exploitation of shark stocks, and therefore is not a good indication of stock status. In short the data that is available suggest that the status of pelagic sharks in the Indian Ocean is worse than implied by the report's authors.

7. Turtles (and FADs). The report does mention turtle captures in FAD sets (page 81) but fails to mention the high mortality of turtles entangled in netting deployed under drifting FADs, and in particular the potential impact of 'ghost fishing' by lost FADs (see e.g. IOTC, 2009). The extent to which Pesqueras Echebastar employed and has now phased out the use of netting under drifting FADs is not discussed. Since this application portrays Pesqueras Echebastar as a progressive, environmentally conscious company, it would be helpful to have this as an indication of the extent of its environmental commitment.

8. Dolphins. The report notes that in 'some areas, i.e. eastern Pacific, larger fish ... frequently school with porpoises' (page 28; see also page 82). The implication is that yellowfin tuna do not associate with dolphins in the tropical Indian Ocean. That is not correct. There is clear evidence that yellowfin tuna do associate with dolphins in the tropical Indian Ocean (e.g. Anderson, 2014). However, this association and its implications for this assessment are not discussed in the main report, despite the fact that it was raised in a public comment (page 350). FCI's response (page 351), that there is prior contrary evidence, is disingenuous and inadequate. (While in no way suggesting that the examples are of comparable significance, prior to Copernicus there was plenty of 'evidence' that the Sun rotated around the Earth). The extent to which purse seiners in the WIO set on dolphin schools is uncertain. However, if a precautionary approach is taken (as appears to be endorsed throughout the report, e.g. page 96) it should be assumed that at least some sets are made on dolphins. That is completely unacknowledged in the report.

9. Whales. The discussion of interactions between whales and the purse seine fishery (page 81) is particularly poor, and fails to take account of the recent review by Anderson (2014). Historically, roughly 10% of purse seine sets (i.e. roughly 20% of non-FAD sets) were whale-associated. There is no satisfactory explanation for the decline in reported numbers of whale-associated sets in recent years, although one likely explanation is deliberate under-reporting by purse seine

skippers. The possibility of inaccurate data reporting, and its implications, has not been adequately considered in the report.

10. Whale sharks. The report states that there 'is no direct evidence to suggest that animals are directly harmed or killed' by the purse seine fishery (page 83). That is not true (e.g. Rowat and Brookes, 2012).

11. PCDR p 74 states "*The CR (v1.3) considers 'main' retained species to be those species that comprise 5% or more of the total catch, or, where less than 5% maybe vulnerable to fishery related impacts through retention as bycatch*".

12. That statement is incorrect. MSC GCR v 1.3 states "*GCB3.5.2 Both SG60 and SG80 use the qualifier 'main retained species'. 'Main' allows consideration of the weight, value or vulnerability of species caught. For instance, a species that comprises less than 5% of the total catch by weight may normally be considered to be a minor species (i.e., not 'main') in the catch, unless it is of high value to the fisher or of particular vulnerability, or if the total catch of the fishery is large, in which case even 5% may be a considerable catch. A species that normally comprises 20% or more of the total catch by weight would almost always be considered a 'main' retained species*".

13. PCDR p 70 states "*Because of the likelihood that freeschool sets will generate varying and mixed catches of tuna because catches of any or all tuna species included in the assessment may be significant in terms of percentage of the total catch for any set, it is appropriate to consider yellowfin, skipjack and bigeye tuna all as main retained species, depending on the particular Unit of certification being scored*".

14. PCDR p 179 states "*In terms of other non-target tuna species that may be retained, data from Pesqueras Echebastar shows that Albacore tuna (Thunnus alalunga) may also be captured, occasionally in significant volumes – up to several tons in a freeschool set. However, albacore catches have not met with or exceeded the 5% main retained species threshold in a review of freeschool set catch data for the fleet under assessment going back to 2008*".

15. As the definition of main species used by the CAB is incorrert, the potential for albacore being considered main, due to its value has not been considered.

16. MSC CR V1.3 Page C167. CB3.5.1 "*The team shall interpret retained species in P2 as those parts of the retained catch that are not covered under P1 because they are not included in the Unit of Certification*".

17. MSC CR 11.3 defines Unit of Certification as The target stock(s) combined with the fishing method/gear and practice (including vessel/s) pursuing that stock. When the term "unit of certification" is used for fisheries that are in assessment, it refers to the "unit of assessment" or "unit of potential certification".

18. The announcement on the MSC web site dated 22 January 2013 (http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/indian-ocean/echebastar_indian_ocean_purse_seine_skipjack_yellowfin_and_bigeye_tuna/assessment downloads-1/20130122_AAMNT_ANMT_TUN393.pdf) lists 6 units of certification covering yellowfin, skipjack and bigeye.

19. PCDR Executive Summary states "*This report provides details of the MSC assessment process for the Pesqueras Echebastar Indian Ocean skipjack, yellowfin and bigeye*"

20. In scoring (and this is a general comment for all 3 Principles, the CAB fails to respond to the MSC CR *"27.10.6 To contribute to the scoring of any PI, the team shall verify that each scoring issue is fully and unambiguously met. 27.10.6.1 Rationale shall be presented to support the team's conclusion"*.

21. MSC CR 27.10.7 states *"In Principle 2, the team shall score PIs comprised of differing scoring elements (species or habitats) that comprise part of a component affected by the fishery"*.

Principle 2 PIs and scoring

2.2.1 SId All species

1. The assessment states that captured sharks are retained. No 'measures or practices ...in the fishery...not causing the retained species to be outside biologically based limits' are specified, and so a score of 60 is not justified.

2.1.2

1. No evidence is presented at SG80 that a partial strategy related to sharks and rays has been implemented in the fishery. There is no genuinely credible strategy for managing shark species.

2. Silky shark is considered as the most vulnerable species under the SICA analysis. Yet silky shark is not mentioned specifically in the rational for scoring of PI 2.1.2. While some shark is mentioned in the scoring of SIA it is not clear how this has contributed to the conclusion that the three UOCs meet SGB0 SIA.

3. The scoring rational for PI 2.1.2 SIB does not take into consideration shark – the score of 80 is awarded purely on consideration of the tuna species that should not be considered in the first place.

4. PI 2.1.2 SIC 80 requires *"There is some evidence that the partial strategy is being implemented successfully"*.

5. PCDR p196 claims that this requirement is met by *"In addition additional measures have been adopted through resolutions that specifically aim to manage impacts of tuna fisheries on a number of vulnerable species groups, including sharks, whale sharks, cetaceans and turtles. Growing support for enhanced management and agreement between contracting parties on implementation of a swathe of new resolutions is seen as evidence of growing commitment to improve Indian Ocean tuna stock management as well as impacts on non-target stocks/species. Adoption of resolutions is a basis for confidence that strategies (which have been designed to manage impacts) will ultimately work as they will have been agreed by and apply to all contracting parties. Adoption of resolutions further demonstrates co-operation, agreement and commitment amongst contracting parties to ensuring future sustainability of the fisheries."*

6. In our view this is not evidence that a partial strategy is being implemented successfully; rather it there is a partial strategy, with the rational used in scoring PI 2.1.2 SIA.

7. We conclude that insufficient evidence is provided to score PI2.1.2 at 80

2.1.3

1. PI 2.1.3 SIA - silky shark is not specified in the scoring rationale and the score of 80 is not justified, in our opinion is should score no more than 60.

2. PI 2.1.3 SID SG80 requires *"Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)"*

3. Part of the justification used by the CAB is (PCDR p 202) *"In the future, additional data in relation to shark bycatch may become available as a result of implementation of IOTC Resolution 13/06."* This is not relevant to the need for sufficient data continue to be collected.
   Availability of information to inform management of retained species. Inadequate for shark species. Should score no higher than SG60.

2.2

1. Bycatch species: To say that all 'bycatch' is covered under the categories of retained species of ETP species, and therefore there is no bycatch so 2.2.1 scores SG100, smacks of sleight of hand. Since bycatch species have been considered under 2.1 and 2.3 there should be no score for 2.2 (not an imaginative average of 90).

2.3.1

1. For SIa, the effects of the fishery on cetaceans have been called into question by the work of Anderson, 2014 (and references therein). There does not appear to be sufficient information to support the effects of the fishery being known (SG80), not that effects are 'highly likely' to be within limits of protection (SG60). Limits are not specified nor estimates of mortality in relation to these. The same issues also apply to SIb.

2. The scoring of PI 2.3.3 also calls this information into question.

3. Several of the ETP species considered are believed to have low population sizes; therefore low catches do not necessarily indict lack of impact on populations as suggested in the report. Furthermore the report underestimates interactions with cetaceans, and mortality of whale sharks and manta rays. Should score less than SG60.

2.3.2

1. For SIb, the lack of information highlighted above also calls into question whether there is actually an objective basis for confidence that a strategy would work (SG80).

2. For SIc, the evidence presented does not address whether the strategy is being implemented or not (SG80). The Strategies that are in place are far from comprehensive, should score no more than SG60.

2.3.3

1. For SIc, there does not appear to be sufficient information at present to measure trends - there is no time series of data. Available information is limited and is not sufficient to estimate mortality of all ETP species. Should score less than SG60.

2.5.1

1. Impacts on ecosystem. Knowledge of ecosystem structure and function is very limited. Should score no more than SG60.

2.5.3

1. Knowledge of impacts of fishery on ecosystem. There is very poor understanding of ecosystem impacts. Should score SG60 or less.

Principal 3 General Comments

1. PCDR p14 "*IOTC is the RFMO whose area of competence includes the Indian Ocean and stocks of highly migratory species. Within the area, the fishery may operate in the FEZ of a number of countries including the Seychelles, Kenya, Madagascar as well as other nations*".

2. "*A network of bilateral tuna fisheries agreements in the Indian Ocean boosting sustainable regional integration economy. The ongoing EU bilateral tuna fishing agreements in the south west of the Indian Ocean offer fishing opportunities for the European fishing fleet in the Exclusive Economic Zones (EEZ) of Madagascar, Mozambique, Comoros, Seychelles and Mauritius*". (http://eeas.europa.eu/delegations/mauritius/regional_integration/tuna/index_en.htm)

3. A number of ex-ante and ex-post reports evaluations have been prepared over recent years analysing the impact (potential and actual) of the various agreements. For example, Ex-post and ex-ante evaluation of the protocol to the fisheries partnership agreement between the EU and the Republic of Mozambique (07/05/2014), Ex-post evaluation of the current Protocol to the Fisheries Partnership Agreement between the European Union and Madagascar (12/03/2014), and Ex-post evaluation of the current Protocol to the Fisheries Partnership Agreement between the European Union and Comoros (15/05/2013).

4. We find it surprising that there is not a more detailed description of the EU FPAs with Indian Ocean countries and the extent to which Echebastar owned vessels have taken advantage of and benefited from the available opportunities.

5. 3.2 MSC GCB 4.0 states "*Fishery Specific Management System' focuses the team on the management system directly applied to the fishery undergoing assessment. The focus should be on the management system of the UoC, which for some fisheries will include both national and international components*".

6. PCDR p 8 (Section 3.2.1) states that the fishery under assessment is the Echebastar purse seine tuna fishery, some of which operates under the auspice of individual EU FPAs

7. We would anticipate that PIs 3.2.1 – 3.2.5 would refer to this fishery in the context of other parts of the management system. This is not the case.

Principle 3 PIs and scoring

3.2.1

1. In scoring, the CAB fails to respond to the MSC CR *"27.10.6 To contribute to the scoring of any PI, the team shall verify that each scoring issue is fully and unambiguously met. 27.10.6.1 Rationale shall be presented to support the team's conclusion"*.

2. There is no mention of the Echebastar fishery in the rationale.
   PCDR p 245 states *"Some objectives are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 are explicit within the fishery's management system"*. However, no evidence is provided to support that finding.

3. The scoring rationale goes on *"In the national context, there does not appear to be any short-term objectives explicit designed to achieve the outcomes expressed by MSC's Principles 1 and 2, Seychelles, as member of IOTC, adopts the management measures proposes by IOTC but don't have a management plan with short-terms objectives included."*

4. Our interpretation of the rationale provided fails to find support for the score of 70 i.e. that SIA SG80 (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's management system) has been partially met.

5. In our opinion the maximum score possible for PI 3.2.1 is 60

3.2.4

1. MSC CR v 3 CB4.10.3 states *"Teams shall interpret a "research plan" in both SG80 and SG100 to mean a written document that includes a specific research plan for the fishery under assessment, relevant to the scale and intensity and the issues requiring research"*.

2. In scoring, the CAB fails to respond to the MSC CR *"27.10.6 To contribute to the scoring of any PI, the team shall verify that each scoring issue is fully and unambiguously met. 27.10.6.1 Rationale shall be presented to support the team's conclusion"*.

3. The CAB fails to provide any evidence that the fishery meets the MSC requirement. There is not a research plan – the fishery does not meet SIA SG80, SIB SG100. On the basis of the evidence presented the maximum score possible is 70 and not the 90 allocated by the CAB.

3.2.5

1. No justification or rationale are presented that allow for a conclusion that the fishery scores 80.

Stakeholders Submissions - Communication to date and Outstanding Matters

During the process there has been communication between IPNLF, the CAB and also ASI which has not all been included in the PCDR;

i) Objection to selection of the team, in our opinion this matter was not addressed correctly by either FCI nor ASI and remains outstanding from our perspective.

ii) Objection to the peer reviewers

iii) Questions relating to observer work and a Greenpeace video. The last communication relating to this was an email from Lesley Anderson on 11/12/14 confirming receipt of my furthers comments advising she would be in touch in due course, at the time of writing this letter a response has not been received.
Please refer to appendices 1 to 3 for copies of this correspondence.

Yours faithfully,

John Burton

Chairman

cc Rupert Howes – MSC
cc Sonke Fischer - ASI

13

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FCI Response to John Burton – IPNLF

The FCI assessment team offers the following response to the key concerns noted in the letter submitted by Mr. John Burton of IPNLF

Major concerns

(a) Units of Certification – Six Units of Certification still remain under assessment as posted on the Notifications published on the MSC web site and as referred to in the IPNLF comments. Progress of the three Free School UoC's however has diverged in terms of the timeline from progress on the three FAD related UoC's, as a result and following clarification from MSC it was decided to take the Free School UoCs to scoring and reporting ahead of the FAD UoC's.

The FAD related UoC's remain in assessment and will progress to scoring and reporting separately in due course, an amended timeline for the FAD UoC's will be published clarifying the timeline for their expected progress through assessment.

The assessment team have amended the text in sections 1, 5 and 6.4 of the report to clarify the status and situation of the six units of certification included within the assessment of this fishery.

(b) Principal 3 (response required by P3 expert)

General comments

1. No response required
2. Section 5 of the Report has been amended to clarify the situation with regard to traceability and eligibility to use the logo, in essence Free School caught tuna will not be eligible to enter MSC chains of custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels.
3. As noted the assessment report provides numerous references to the legal framework in which the fishery operates, and documents the levels of observer coverage in the fishery.
4. The report is being edited prior to final publication
5. The report is clear on the definitions of retained, non-target species, and bycatch that is discarded and follows MSC distinctions as specified in CR v.1.3.
6. The level of observer coverage is two per vessel, and the correction in the language of Condition 7 has been made.
7. Seabirds are not addressed in the bycatch and retrained species sections of P2 in the report, as they are not captured in the free school purse seine fishery, or other purse seine fisheries. They are regularly captured in gillnet and longline fisheries. The Danckwerts, et al. 2014 report that is referred to in comment #7 addresses the potential secondary effect of all tuna fishery catches in the western Indian Ocean, reducing the feeding opportunities for breeding seabirds. Seabirds are also not addressed in the ETP or ecosystem sections of the report, as the stocks of tuna that are targeted by the free school purse seine fishery are considered to be within their respective reference points for biomass and fishing mortality. Additionally, the free school purse seine fishery represents a very small portion of the total removals from these tuna stocks, therefore the ecosystem impacts of the free school fishery are considered negligible on seabirds.

P1 general comments and PI scoring the point raised relates to the the use of CR V2.0. The approach used was appropriate at the time of writing

P2 general comments and PI scoring

General Comments

1. The report has been edited in an attempt to clarify the definitions in particular those associated with the UoCs. The three UoCs addressed in this report are only those made in "free school" of tuna. All other sets including those associated with FADs, seamounts, and marine mammals are in the other three UoCs that are addressed in this report

2. Certification of one UoC, "free school" sets, does not preclude later certification of another UoC, that is sets made in association with FADs, seamounts, and marine mammals, if and when those fisheries can be demonstrated to meet MSC standards.
3. As Mr. Burton points out the Amande et al. 2008 report includes sets made in association with seamounts and whales in the "free school" category. Therefore any impacts attributable to just "free school sets" will be even less that that reported by Amande et al, as the free school sets are only a portion or subset of all the non-FAD sets. The text of the report has been modified to clarify this discintiction.
4. Section 5 of the Report has been amended to clarify the situation with regard to traceability and eligibility to carry the logo, in essence Free School caught tuna will not be eligible to enter MSC chains of custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels. FAD caught tuna is not yet eligible to enter the supply chain carrying the MSC logo.
5. As noted in comments #5, the 100% observer coverage was only initiated in Jan 2014, and the data collected starting on that date has not been vetted and released for analysis. This data will be available and used in later audits of the fishery. Therefore the statements in the report are not incompatible.
6. The status of the shark stocks that are impacted by the free school set tuna fishery in the Indian Ocean are thoroughly reviewed in the assessment report. As noted by the commenter, in the last decade the data of Coehlo et al. (2012) indicate stable or increasing stocks. Comments suggesting that the status of the sharks is worse than reported in the report are speculative, and without merit.
7. This comment refers to the impacts of the FAD associated purse seine fishery on sea turtles, and this assessment report addresses free school set fishery. The comment is not relevant to the fishery being assessed.
8. This comment addresses the issue of yellowfin tuna being captured in association with dolphins. This assessment report addresses the "free school" sets of the purse seine fishery. Therefore the issue of whether or not yellowfin tuna are captured in associations with dolphins, or how often that occurs is not relevant to this assessment report. This will be addressed if and when the other UoCs that include sets made with FADs, seamounts, and marine mammals proceed with an assessment.
9. This comment addresses the interactions between whales and the purse seine fishery. This assessment report addresses the "free school" sets of the purse seine fishery. Therefore the issue of whether whales are captured in the purse seine fishery, or how often that occurs is not relevant to this assessment report. This will be addressed, if and when the other UoCs that include sets made with FADs, seamounts, and marine mammals proceed with an assessment.
10. This comment addresses whale sharks and the purse seine fishery. The Rowat and Brooks (2012) report cites documented whale shark associated purse seine sets in the Pacific Ocean as a possible source of mortality of whale sharks. The referenced report does not mention the Indian Ocean purse seine fishery. Additionally, the report does not confirm the level of mortality related to whale shark associated sets, but does note that many whale sharks are released alive. The "free school" set fishery by definition should not interact with whale sharks, and future observer coverage will be able to document this, should it occur.
11. This comment is a statement, related to the following comment, #12.
12. This comment is correct, but the statement from the PCDR page 74, referred to in comment 11 is simply a simplification of that statement. In this assessment of the free school set purse seine fishery, the issue of the retained species and bycatch is confusing, as virtually all the catch is retained. However, for the purposes of clarity, the report addresses three separate UoCs in P1, (skipjack, yellowfin, and bigeye tuna) and each UoC has retained main species of the other two species.
13. That is a correct statement from the PCDR, that is referred to in comment 15
14. That is a correct statement from the PCDR, that is referred to in comment 15

15. The report follows MSC guidance in the definitions of target and retained species, Albacore tuna represents a very small portion of the catch in any case, and therefore was considered as a minor retained species, as per MSC guidance.
16. This is a correct statement.
17. Ths is a correct statement.
18. This is a correct statement
19. The statement in this comment from the PCDR Executive Summary, and also when used through out the report has been corrected to clarify that this assessment report addresses only the "free school sets" of the Echebaster Indian Ocean Purse seince Fishery for bigeye, yellowfin and skipjack tuna.
20. The text of the scoring in the draft report provides the rationale to support the scoring for each issue. In some cases the evidence presented was not related back to the specific SG elements. This has been corrected.
21. This is a correct statement for the MSC CR, but the comment does not refer to a specific problem with the assessment report, and therefore can not be responded to.

P2 PIs and scoring

2.2.1 The report clearly indicates that all sharks are retained, as there is no way to separate sharks from the catch, with the exception of very large sharks. As per MSC guidance, and as noted in the comment, since virtually all sharks are retained, they must be addressed in section 2.1 of the scoring, not section 2.2. With regard to the section 2.1 the analysis of retained sharks, the evidence indicates that sharks represent 0.03% or 3:10,000 units by weigth of the tuna catch. This certainly qualifies as a minor retained species, unless the species covered under ETP considerations. The assessment report has correctly addressed the shark catch.

2.1.2 In response to comments by this and other stakeholders, the text that provides the rationales for the scoring of each issue relative to the element of each Scoring Guidepost (SG) has been edited to include specific reference to the element of the SG that is met with the evidence provided. The assessment team believes that a score of 80 for PI 2.1.2 is appropriate and is now adequately justified.

2.1.3 In response to comments by this and other stakeholders, the text that provides the rationales for the scoring of each issue relative to the element of each Scoring Guidepost (SG) has been edited to include specific reference to the element of the SG that is met with the evidence provided. The assessment team believes that a score of 75 for PI 2.1.3 is appropriate and is now adequately justified. Condition 7 as described will improve this score to 80 when completed.

2.2 This comment questions the scoring of the bycatch PIs. PI 2.2.1 is an outcome PI that addresses the risk of the fishery to the bycatch species. Since there are no bycatch species other than the ETP species, this PI was scored at 100. PI 2.2.2 addresses the strategy for managing bycatch, and this was scored at 90 as there is not a full or comprehensive strategy for bycatch in this fishery. PI 2.2.3 addresses the information available to manage bycatch, and this was scored at 80, The assessment report fully details the rationale for these scores, and the assessment team believes that the scores are not "imaginative" as suggested by the commentor.

2.3.1 PI 2.3.1 is an outcome PI and addresses the risk of the fishery to ETP species. The assessment report provides a complete rationale for the score of 85 given for this PI. The score of PI 2.3.3 is the PI that addresses strategies for the management of risk to ETP species by the fishery.

2.3.2 This PI was scored at 85, and the text of the scoring for each issue details the evidence to support the scores awarded for each issue against the relative SGs. The assessment team believes that the evidence presented indicates that there is an objective basis for confidence that the strategy has been implemented and is working.

2.3.3 This PI address the information available to manage the risk to ETP species, and was scored at 75, The commentor questions the score for issue c, and in response the assessment team believes that information is sufficient to measure trends and support a full strategy to manage impacts on ETP species, and that the evidence is presented in the scoring section of the report to substantiate this.

2.5.1 This PI addresses the outcome issue of ecosystem impacts related to the fishery. It was incorrectly scored at 90, and this was also noted in other stakerholder comments, It has been rescored to 80. The assessment team believes that the evidence as presented in the report indicates that the fishery 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, and this meets the SG 80 level

2.5.3 The text of the scoring rationales for each of the issues on this ecosystem impacts information PI clearly provide sufficient evidence to meet the SG 80 element for each of the issues covered by this PI. There is no need to repeat them here. The overall score fof the assessment team for this PI is 80,

P3 general comments and PI scoring

Stakeholder submissions – Communications to date and Outstanding Matters

i. For the sake of clarity FCI have added the relevant communications and ASI report regarding the objection to the proposed assessment team members to the Final Report.

ii. Correspondence to relating to the stakeholders objection to the peer reviewers has been included in the Final Report.

iii. MSC fishery assessment teams do not have a remit to undertake at sea observation of fisheries under assessment, eveidence relating to observer programmes in place in this fishery are described within the assessment report.

FCI acknowledge receipt of the details of the Greenpeace video referred to by the stakeholder, the content and context has been taken into account by the assessment team as part of their deliberations.

AWI (Animal Welfare Institute) – Kate O'Connell

From: Kate O'Connell [mailto:kate.oconnell@balaena.org]
Sent: 19 January 2015 20:03
To: FCI Fisheries
Cc: Melissa McFadden
Subject: comments in Echebaster Indian Ocean Purse Seine skipjack, yellowfin and bigeye tuna

Attached please find comments from the Animal Welfare Institute (AWI) on the Echebaster Indian Ocean Purse Seine skipjack, yellowfin and bigeye tuna assessment.

Thank you, and please feel free to contact me if you have any questions.

Kate O'Connell
Marine Wildlife Consultant
Animal Welfare Institute

From: Carol Leiper
Sent: 20 January 2015 10:12
To: 'kate.oconnell@balaena.org'
Subject: FCI to KO - Acknowledgement of Comments on PCDR - EIOtuna 20 01 15

Dear Ms O'Connell

FCI would like to acknowledge receipt of your comments on the Public Comment Draft Report for this fishery assessment and thank-you for your input.

Your comments have been passed to the assessment team for this fishery and are currently being considered in light of the points that you have raised.

We will come back to you on this as soon as we can.

If you do not wish to be kept informed of the progress of this fishery assessment, please contact FCI and we will remove your details from the stakeholder list.

Kind regards.
Fisheries Department

Contact Information Make sure you submit your full contact details at the first phase you participate in a specific assessment process, subsequent participation will only need your name unless these details have changed.		
Contact Name	*First* Susan	*Last* Millward
Title		
On behalf of (organisation, company, government agency, etc.) – *if applicable*		
Organisation	*Please enter the legal or registered name of your organisation or company.* Animal Welfare Institute (AWI)	
Department		
Position	*Please indicate the position or function you exert within your organisation or company.* Executive Director	

Description	*Please provide a short description of your organization.* The Animal Welfare Institute (AWI) is committed to safeguarding marine species and their habitats. Our efforts focus on curbing humankind's harmful impact by urging governments and other decision makers to halt or prevent damaging actions, as well as educating the public and seafood industry about the deleterious effects their actions can have on the oceans' inhabitants, including fisheries by-catch of non-target marine mammals species and sharks. AWI regularly participates in international fora, including meetings of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the International Whaling Commission (IWC). The organisation regularly participates in the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea. AWI has also funded research related to the mitigation of cetacean entanglement in fishing gear.				
Mailing Address, Country	900 Pennsylvania Ave SW Washington, DC 20003 USA				
Tel	+01 202 337 2332	**Mob**	+	**Fax**	+
Email	susan@awionline.org			**Web**	www.awionline.org

P1.2.1 SKJ, P1.2.1 YFT and P1.2.1 BET E Shark finning N/A

Despite the fact that both European Union (EU) and Seychellois law prohibit shark finning, we note the recent Indian Ocean Tuna Commission (IOTC) reviews of blue sharks (*Prionace glauca*), silky sharks (*Carcharhinus falciformis*) and oceanic whitetip sharks (*Carcharhinus longimanus*) all indicate that the practice of shark finning is increasing.[1] Further, IOTC members could not reach agreement on either a resolution or a recommendation at the June 2014 meeting prohibiting the removal of fins from sharks onboard vessels.[2]

This conclusion is unfortunate considering that "EU purse seine vessels reportedly release sharks when they are captured, although it is likely that this is not always possible and does not always happen." Report at 191. Moreover, no guarantee is provided in the report that shark finning is not taking place on Echebaster vessels in the report. Monitoring of evidence of finning could be obtained through observer coverage of fishing vessels though there is for, example, no proof that the 100% observer coverage by Seychelles Fisheries Authority (SFA) since the 20 August 2014 letter referenced in the report (see page 278) has continued.

PI 2.3.1. Score 85

Nature of comment: 1,2

Based on the information provided below, AWI believes that the score of 85 for ETP species is inflated, as the effects of the fishery are not fully known and therefore cannot be said to be likely within limits of national and international requirements for protection of the affected ETP species. We believe that the score for this section must be revised downward.

As an initial matter, AWI notes with concern that the CAB assessment states that, "the assessment team found that there is inconsistent recording of interactions with ETP species by Echebastar vessels during free school fishery sets." CAB Report at 84. This raises the question of whether the CAB has been able to determine if the presence of onboard observers improved the recording of such data?

The CAB assessment indicates that the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is the only international conservation agreement directly or potentially applying to sea turtles. However, AWI notes the existence of the "Memorandum of Understanding on the

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[1] IOTC-2014-SC17-ES17[E] Status of the Indian Ocean blue sharks (BSH: Prionace glauca); IOTC-2014-SC17-ES21[E] Status of the Indian Ocean silky shark (FAL: Carcharhinus falciformis); IOTC-2014-SC17-ES18[E] Status of the Indian Ocean oceanic whitetip shark (OCS: Carcharhinus longimanus).
[2] IOTC-2014-WPEB10-04 OUTCOMES OF THE 18th SESSION OF THE COMMISSION June 2014.

Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (IOSEA)." The IOSEA is an intergovernmental agreement that aims to "protect, conserve, replenish and recover marine turtles and their habitats of the Indian Ocean and South-East Asian region." The Seychelles is a signatory to IOSEA.

A main component of the IOSEA programme is the tagging and tracking of sea turtles by means of flipper tags. The CAB should advise Echebaster UoC about this programme to ensure that if flipper tags are recovered during its operations that such information is made known to the IOSEA at http://flippertag.ioseaturtles.org/.

AWI notes that the IOTC is particularly concerned about loggerhead sea turtles (*Caretta caretta*). For example, the IOTC Working Party on Ecosystems and Bycatch stated that "[t]he extreme pelagic nature of the tracks made it clear why these loggerhead turtles are vulnerable to tuna-related fisheries."[3] Furthermore, Clermont *et.al.* (2013) noted that due to uncertainties caused by low observation coverage and the scarcity of marine turtle bycatch events, "it was impossible to produce solid and reliable global estimates of marine turtle bycatch and mortality" caused by purse seine activity in the Indian Ocean.

Consequently, whilst the CAB's justification for the P.2.3.1 scoring states that, "CITES has effectively curbed international trade in sea turtles primarily by prohibiting commercial international trade in all species of sea turtles and their body parts". IOSEA has indicated that black markets for sea turtle products have been identified in the Indian Ocean countries of Kenya and Seychelles, and expressed the need for further investigations in most of the other countries of the region.[4] Further IOSEA has also warned that there are emerging commercial activities based on marine turtle exploitation in other Indian Ocean countries.[5]

In addition, whilst CITES does prohibit commercial international trade in sea turtles and the body parts, a 2013 review of CITES data by the World Conservation Monitoring Centre (WCMC) states that, "high profile species including elephants and sea turtles" were prevalent in seizures of illegally traded goods, indicating that global commerce in sea turtles and their body parts continues.[6]

Even if turtles are released alive from free school sets, there are still concerns with post-release survival rates. The manner in which sea turtles are handled is important to their post-release survival. Fishermen should know how to assess

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[3] 8th Meeting of the Indian Ocean Tuna Commission's (IOTC) Working Party on Ecosystems and Bycatch (WPEB) took place in Cape Town, South Africa, from 17 - 19 September 2012.
[4] ILLEGAL TAKE AND TRADE OF MARINE TURTLES IN THE IOSEA REGION, MT-IOSEA/SS.7/Doc. 10.1 SEVENTH MEETING OF THE SIGNATORY STATES Bonn, Germany 8-11 September 2014
[5] Der supra note 3
[6] GOV16 INF. 54 CITES TRADE – A GLOBAL ANALYSIS OF TRADE IN APPENDIX-I, II & III SPECIES Sixteenth meeting of the Conference of the Parties Bangkok (Thailand), 3 to 14 March 2013

the condition of the turtles to determine if they are injured, comatose or otherwise compromised before releasing them, or if necessary due to their condition, seeking their rehabilitation.

In justifying its P.2.3.1 scoring, the CAB refers to the Clermont *et. al.* (2012) paper report and states that 86% of turtles were released into the sea, which is actually an average of the Atlantic and Indian Ocean interactions with sea turtles (see also Report at 81). We believe that the CAB should have gone on to recognise that the paper reports a lower rate of 77% of sea turtles being released alive in the EU purse seine fishery in the Indian Ocean.[7] Further, a more recent paper by Bourjea *et.al.* (2014) drops this survival rate to 73%.[8]

Post-release survival is of considerable concern for all ETP species. In the case of sea turtles, injured or unresponsive turtles should be kept on board, to the extent practicable, in a manner consistent with maximizing their survival prior to release.

To supplement the workshop training on good practices related to shark and ray interactions that Pesqueras Echebaster skippers and crew attend, AWI encourages the CAB to share with the UoC a series of turtle revival and release videos, available in Spanish and English, that have been made available online by the Inter American Tropical Tuna Commission (IATTC). See e.g. http://www.iattc.org/Downloads/IATTC-OFCF-Revive.mp4.

With regard to cetaceans, in addition to CITES, we draw the CAB's attention to the Indian Ocean Whale Sanctuary (IOWS) that was established by the International Whaling Commission (IWC). Whilst the IOWS is aimed at protecting large cetaceans from commercial exploitation, we note that the IOWS has also generated research into the status of both large and small cetaceans found within the boundaries of the sanctuary.

The CAB has indicated that "two species of cetaceans were recorded during purse seine fishing for tuna in the Indian Ocean. Specifically, it indicated that fin whale *Balaenoptera physalus* (IUCN endangered), false killer whale *Pseudorca crassidens* (IUCN Data Deficient)," and sei whales (*Balaenoptera borealis*) are also known to have been affected by purse seining. Furthermore, Romanov *et.al.* (2014) have identified twelve species of cetaceans that have been associated with purse seining activities in the Indian Ocean. These are the blue whale (*Balaenoptera musculus*), the fin whale (*Balaenoptera physalus*), the sei whale (*Balaenoptera borealis*), the Bryde's whale (*Balaenoptera edeni [brydei]*), the Antarctic minke whale (*Balaenoptera bonaerensis acutorostrata*), the rough

[7] Clermont S, Chavance P, Delgado A, Murua H, Santiago J, Ciccione S, and Bourjea J. (2012) EU PURSE SEINE FISHERY INTERACTION WITH MARINE TURTLES IN THE ATLANTIC AND INDIAN OCEANS: A 13 YEARS ANALYSIS. IOTC-2012-WPEB-38-35-Rev1.

[8] Bourjea J, Clermont S, Delgado A, Murua H, Santiago J, Ciccione S, and Chavance P. (2014) Marine turtle interaction with purse-seine fishery in the Atlantic and Indian Oceans: Lessons for management. Biol. Conserv. 178: 9014.

toothed dolphin (*Steno bredanensis*), the bottlenose dolphin (*Tursiops truncatus*), the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*), pan tropical spotted dolphin (*Stenella attenuata*), spinner dolphin (*Stenella longirostris*), striped dolphin (*Stenella coeruleoalba*), and the common dolphin (*Delphinus delphis/capensis*).[9]

Of the species named above, all of the great whales are listed on CITES Appendix I, as are all beaked whale species. Several of the dolphin species identified are listed as Data Deficient by IUCN. In addition to noting the death of a sei whale in a purse seine net, as does the CAB assessment, Romanov (2014) further notes the potential for interactions with purse seine nets for an additional twelve species of cetaceans.[10]

Anderson (2014) noted that, "the major potential cetacean interactions are with free school sets," and probably involve Bryde's whales. Whale-associated tuna fisheries have been documented in the past in the Indian Ocean and may have reached as high as 9% of tuna purse seine fishing effort in certain seasons.[11]

Although it has been reported that most whales were reported to escape by breaking through the net,[12] post-escape survival rates are unknown, and we agree with the CAB's statement that exceptional events may occur that could lead to mortality. Capietto *et.al.* 2012 noted that 68% of whales escape by "tearing up the net if encircled."

Anderson (2014) noted that while the mortality rate of large whales in the tuna purse seine fishery is unknown, it could be in the order of tens of whales annually. The IOTC has also recognized that whales are possibly injured during efforts to free themselves from nets. Given that cetaceans are long-lived animals with slow reproduction rates, the stress of capture in such fisheries, as well as injuries caused by such interactions, potential post-release mortality may result in negative impacts on their populations.[13]

Chassot *et.al.* (2013) estimated that there were 15,995 whale-associated sets by the Indian Ocean tuna fleet from1981-2010 of which perhaps 23% were actual

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[9] Romanov, E.V., Anderson, R.C., Floch, F. and Menkam, M. 2014. A concept note on the need to develop an IOTC guide for marine mammals. IOTC-2014-WPEB10-32.

[10] Per supranote 9. The species identified as possibly interacting with purse seining in the Indian Ocean are Southern right whales, humpback whales, sperm whales, pygmy sperm whales, dwarf sperm whales, Cuvier's beaked whale, Blainville's beaked whale, ginkgo-toothed whale, Longman's beaked whale, Fraser's dolphin and the False killer.

[11] Anderson, R. C. (2014) Cetaceans and Tuna Fisheries in the Western and Central Indian Ocean. IPNLF Technical Report 2. International Pole and Line Foundation, London. 153 pages. See also Romanov E.V. (2012) Tuna fishery in the tuna purse seine fishery in the western Indian Ocean. Fisheries Bulletin, 110: 93-105 and Capietto A., R. Pianet, A. Delgado De Molina, H. Murua, L. Floch, A. Damiano, F. Chavance and F. Menger (2012) Interactions between marine mammals and the European tropical tuna purse seine fishery in the Indian and Atlantic Oceans. IOTC-2012-WPEB08-41: 1-24.

[12] See Capietto et al as per supranote 10 "68% of whales escape by 'tearing up the net if encircled.'

[13] See e.g. Cassell, R., Moore, S.M., McLellan, W.A., Barco, S.G., Rotstein, D., and Moore, M.J. (2011). Lethal entanglement in baleen whales. Dis Aquat Org. 96: 175-185.

sets on whales. In light of this, Anderson (2014) noted that "the number of whales affected may not have been trivial."[15]

Even low levels of removal could have an impact on ETP cetaceans. There are two areas where whale-associated sets are known to be common in the Indian Ocean. The main area is to the east of Seychelles, at roughly 5°S 60°E, where fishing on whales occurs during the period from November to April.[15]

The CAB notes that, "Romanov (2002) also reports on interaction of IO purse seine fisheries with cetaceans – however these relate to associated sets also." Nevertheless, we note that a main point of concern highlighted by both Romanov *et.al* (2014) and by Anderson (2014) is the fact that much of the tuna purse seine fishing practice in the Indian Ocean related to whales and dolphins remains "cryptic." Indeed, most of the sets on whales have been declared to be unintentional interactions rather than a direct set on a cetacean species.[16]

Furthermore, whilst we know that this fishery is not being assessed under the terms of new Fisheries Certification Requirements v.2, we would like to raise our concerns with the potential cumulative impacts of bycatch on ETP species in the Indian Ocean. For example, Anderson (2014) indicated that it is possible that current bycatch from the western and central Indian Ocean tuna gillnet fisheries is on the order of 60,000 small cetaceans per year.[17] With regard to sea turtles, Clermont *et.al.* drew attention to the ghost fishing phenomenon occurring on floating devices (that do not end up in a fishing set) which is believed to be an "unquantified source of turtle mortality through entanglement and subsequent drowning."[18]

P.2.3.2 Score 85

Nature of comment 1,2

The CAB states that, "Overall opinion of the published scientific community seems to support the understanding that the rates of interaction of free school tuna sets with purse seine gears does not result in unsustainable levels of impact or interaction with ETP species." Based on the analysis and conclusions made by Clermont *et.al.* (2012), Romanov *et.al* (2014) and Anderson (2014), however, AWI believes that this score should be lowered.

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[14] Chassot E., A. Delgado de Molina, C. Assan, P. Dewals, P. Cayré, J.J. Arrizabalaga, D.M. Kaplan, Bourjea and S. Hoch (2012) Statistics of the European Union and associated flags purse seine fishing fleet targeting tropical tunas in the Indian Ocean (1981-2011). Indian Ocean Tuna Commission - IOTC-2012-WPTT-DATA-03 and Anderson, per supranote 11.

[15] Robinson D. (1992) Balaenopterid sightings in the western tropical Indian Ocean (Seychelles area) 1982-1991. Pp. 171-178. In S. Leatherwood and G.P. Donovan (Eds) Cetaceans and cetacean research in the Indian Ocean Sanctuary. UNEP Marine Mammal Technical Report. 3: 1-237. Gaglietto et al. 2012 as per supranote 10.

[16] Romanov et.al. as per supranote 8 and Anderson R. C. (2014) Cetaceans and Tuna Fisheries in the Western and Central Indian Ocean. IPNLF Technical Report 2. International Pole and Line Foundation. London. 133 pages.

[17] Per supranote 10.

[18] Clermont et.al. per supranote 7.

P.2.3.3 Score 85

Nature of comment 1,2

AWI disagrees with the CAB's contention that "[i]nformation is sufficient to qualitatively estimate the fishery related mortality of ETP species" and that "[c]onsiderable information is available in relation to qualitative and quantitative nature of interactions between ETP species and the purse seine fleet". The information contained in Clermont *et.al.* (2012), Romanov *et.al.* (2014), and Anderson (2014) undermines this claim.

P.2.5.3 Score 80

Nature of comment 1,2

Based on the information provided above, AWI does not believe that there is adequate knowledge of the impacts of the fishery on the ecosystem, particularly with regard to ETP species. As even the CAB acknowledged, "[d]ata in relation to ETP encounters is not systematically collected onboard vessels…" Therefore, we disagree with the contention that there is a reasonable degree of understanding about rates of impact on these species, and believe that this score should be lowered.

We wish to provide general comments on other aspects of this fishery, as well as about the assessment of this fishery against MSC principles and guidelines.

The CAB defines a free school fishery as one that does not rely on the use of artificial floating objects to aggregate tuna, and then notes that such free school sets are likely to be clean in terms of bycatch. Whilst AWI welcomes the use of true free school sets by purse seiners as a way to avoid bycatch, we are concerned with the fact that in the case of the Echebaster UoC, there seems to be some confusion as to what constitutes a free school set. Anderson (2014) provides some clarification to this question in regard to Indian Ocean purse seine tuna fisheries. Specifically, he states that, "There are two main types of sets: those made on drifting objects or FADs, and those on free schools of tuna. The latter are taken to include all sets other than FAD sets, i.e. including those associated with whales or dolphins."

Indeed, the CAB concedes that "Echebaster vessels can and do make sets in association with baleen whales. It is likely that such sets do occasionally result in mortality to whales, either directly at time of capture or at some time afterwards on account of injuries or trauma sustained during attempts made at escaping from the gears." Report at 89.

Furthermore, the CAB stated that, "[o]nly fin whales were recorded during so-called free-school sets, but in reality these sets were most likely made because of the presence of a whale." Report at 81. The CAB then admits that the association of tuna fisheries in the Indian Ocean with whales is a well-recognised phenomena but that "whale or dolphin associated sets are not included within the scope of the present UoC's, even though Echebaster vessels do carry out whale associated sets."

In addition to a question of the definition of free school sets, AWI asserts that there is a serious problem with regard to traceability for this fishery given that, as recognized by the CAB, the Echebaster fishery "may make sets on both free school tuna and tuna that is associated with FADs, floating objects, seamounts, megafauna (including whale sharks and whales) during the same fishing expedition."

As stated by the CAB, all captured tuna, regardless of method used, are loaded into common wells. Therefore, the UoC lacks the ability to ensure segregation of the tuna so as to guarantee that legitimate free school tuna is separated from tuna caught on whales, other marine megafauna and/or FADS. This presents a significant problem for consumers interested in purchasing tuna that is caught in a manner that does not pose a threat to other marine species.

We believe that prior to any certification, there must be a demonstration that there is programme in place that is capable of ensuring full and accurate recording of ETP species affected by this fishery, and that such a programme has been implemented across the UoC fleet; further it must be ensured that all data on ETP interactions are being submitted to the IOTC. As the condition currently stands for this UoC, such procedures are not called for until the second year of certification.

We also urge the CAB to better define the use of the term "free school" sets, and to consider calling on the UoC to use separate wells for true free school tuna versus tuna caught in association with natural and man-made floating objects, including cetacean associated schools.

References:

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ILLEGAL TAKE AND TRADE OF MARINE TURTLES IN THE IOSEA REGION. MT-IOSEA/SS.7/Doc. 10.1. SEVENTH MEETING OF THE SIGNATORY STATES Bonn, Germany 8-11 September 2014.

IOTC–2014–SC17–ES17[E] Status of the Indian Ocean blue shark (BSH: Prionace glauca); IOTC–2014–SC17ES21[E] Status of the Indian Ocean silky shark (FAL: Carcharhinus falciformis); IOTC–2013–SC16–ES18[E].

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Romanov E.V. (2002) Bycatch in the tuna purse-seine fishery in the western Indian Ocean. Fisheries Bulletin, 100: 90-105

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FCI Response to AWI

The FCI assessment team offers the following response to the thougthful concerns noted in the letter submitted by Ms. Susan Millward of AWI.

P1 comments and PI scoring

Observer coverage on Echebaster vessels is 100%. The milestones for Condition 7 in this report require the reporting of observer data annually. While the assessment teams did not review any evidence of shark finning, and believes that it is not relevant to this fishery, the observer reporting referenced above will be available to document this statement in the future.

P2 comments and PI scoring

PI 2.3.1 This is an outcome PI that evaluates the risk to ETP species caused by the fishery. With regard to issue a, the assessment determined that the effects of the fishery are known and are considered to be highly likely to be within limits of international and national requirements for protection of ETP species, so the fishery meets the requirements for the SG 60 and 80 levels for this scoring issue. However there is a requirement for more direct evidence byway of supporting data in relation to rates of interaction and outcome in order to consider scoring at SG 100. The evidence presented in the justification section for issue a, fully supports the SG 80 level. With regard to issue b, the assessment team considers that the direct effects of the fishery are highly unlikely to create unacceptable impacts to ETP species, so the fishery meets the requirements of the SG 60 and 80 levels for this scoring issue. Further, that there is a basis for a high level of confidence that there are no significant detrimental direct effects of the freeschool fishery on ETP species, so the fishery also meets the requirements of the SG 100 level for this scoring issue. With regard to issue c, the assessment team believes that the indirect effects by way of competition for forage species, destruction of habitat or disturbance have also been considered and are thought to be highly unlikely to create unacceptable impacts, so the fishery meets the requirements of the SG 80 level for this scoring issue. However, due to a lack of specific information and evidence available to the team it was not considered that there is a high degree of confidence that there are no detrimental indirect effects. Thus scoring at SG 100 level was not appropriate. Therefore, the assessment team disagrees with the commentor that the score of 85 is inflated.

However, the commentor raises many good points and suggestions that have been incorporated into the draft report scoring text, as noted below. The assessment team was not aware of the IOSEA program, and has included reference to that in the assessment report, including the statement that if flipper tags are recovered during the fishing operations that the the information be made known to IOSEA at http://flippertag.loseaturtles.org/ . Additionally, the assessment team has recommended that the skippers and crew on the Escebaster purse seine vessels be trained with the IATTC video on the proper procedures for handing and releaseing sea turtles, and Echebaster has added this training requirement to Condition 8. The assessment team recognizes the AWI concern for the post-release survival of sea turtles and has included a requirement in the training of crew for the proper handling, condition assessment and release of sea turtles when captured. The text of the report has been corrected to indicate the estimated release rate of sea trutes encountered in the Indian Ocean purse seine fishery to be approximately 75%, not 86%.

Additional comments in this section are related to cetaceans taken in the purse seine fishery in general, and these comments or concerns while valid, are not relevant to this fishery being assessed, that is the “free school” set fishery. The UoCs being considered in this report specifically exclude tuna purse seine sets associated with FADs, seamounts, and marine mammals.

PI 2.3.2 This is a management strategy PI for ETP species. The AWI has suggested that the score should be lowered, citing recent publications by Clermont et al 2012, Romanov et al 2014 and Anderson 2014. The articles do not support the AWI comment, and in fact the articles cited do not address management issues, but outcome and information issues. The Clermont et al publication states that the observed impact of the tuna purse seine fishery on sea turtles is extremely low in comparison to other fishery sources worldwide. This is supported by an even more recent publication by Borjea et al 2014 in the Journal of Biological Conservation that states that the tuna purse seine fishery in the Indian Ocean has a very low impact on sea turtle populations. The Romanov et al publication is an IOTC document reporting on the need for an identification guide for marine mammals of the Indian Ocean, so that fishermen and observers can properly report the species taken in interactions with fisheries. Finally the Anderson 2014 report is the results of an IPNLF sponsored review of fishery interactions with

cetaceans. The analysis highlights cetacean mortality associated with gillnet fisheries. With regard to purse seine fisheries, the author separates the data into FAD sets and non-FAD or free school sets. Unfortunately this separation does not isolate free school sets alone, as the author's separation groups sets made in association with marine mammals and seamounts with free school sets. In conclusion the assessment team believes that the correct score for this PI is 85.

PI 2.3.3 This is an information PI for ETP species. The AWI has suggested that the score should be lowered, again citing recent publications by Clermont et al 2012, Romanov et al 2014 and Anderson 2014. Only one of the articles supports the AWI comment, and two of the articles cited do not address information issues, but outcome issues. The Clermont et al publication states that the observed impact of the tuna purse seine fishery on sea turtles is extremely low in comparison to other fishery sources worldwide. This is supported by an even more recent publication by Borjea et al 2014 in the Journal of Biological Conservation that states that the tuna purse seine fishery in the Indian Ocean has a very low impact on sea turtle populations. The Anderson 2014 report is the results of an IPNLF sponsored review of fishery interactions with cetaceans. The analysis highlights cetacean mortality associated with gillnet fisheries. With regard to purse seine fisheries, the author separates the data into FAD sets and non-FAD or free school sets. Unfortunately this separation does not isolate free school sets alone, as the author's separation groups sets made in association with marine mammals and seamounts with free school sets.This sorting of the fisheries by gear type follows the scheme used by Amande et al. (2008), but as noted above, does not provide information useful to understanding the impacts of the free school set fishery on sea turtles. Finally the Romanov et al publication is an IOTC document reporting on the need for an identification guide for marine mammals of the Indian Ocean so that fishermen and observers can properly report the species taken in interactions with fisheries.Unfortunately the assessment team does not believe that a single call for a better ID guide should result in the lowering of the score for this PI. In conclusion the assessment team believes that the correct score for this PI is 85.

PI 2.5.3 This is also an information PI for ecosystem impacts of the fishery. The AWI has commented that it disagrees with the contention that there is a reasonable degree of understanding about the rates of impact on these species, and it believes tha the score for this PI should be lowered. The PI has five issues associated with it, and each was scored at the 80 level. The justifications for each issue are provided in the report, and and this section of the reported has been edited in response to other stakeholder comments to provide more specific reference to the Scoring Guidepost elements for each issue. In essence, the team believes that there is adequate knowledge to broadly understand the key elements of the ecosystem, that the main impacts of the fishery on these elements can be inferred from existing information, that the main function of the ecosustem components are known, that there is sufficient information known to assess the impact of the fishery on the system components, and that sufficient data continues to be collected to detect any change in outcome indicator scores. Lacking a specific rationale or reference for lowering the score in the AWI comment, the assessment team believes tha the score of 80 for this PI is adequately justified.

General Comments:The definition of a "free school" set for the unit of certification being assessed in this report has been clearly defined, and it is different than that used in the Anderson (2014) report. The two types of UoCs in the Echebaster Purse Siene tuna fishery have been defined as those that are unassociated or a "free school" sets, and those that are associated with FADs, seamounts, and marine mammals. It is unfortunate that the Anderson in his 2014 analysis segrated his data differently, so that his results are not applicable. This distinction has been noted elsewhere in the responses to stakeholder comments.

With regard to the stakeholders comments relating to Chain of Custody Section 5 of the Report has been amended to clarify the situation with regard to traceability and eligibility to use the logo, in essence Free School caught tuna will not be eligible to enter MSC chains of custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels.

The Report has also been amended to more clearly define the term free school in terms of what type of catch is eligible under the 'Free School' Units of Certification.

MSC - Marine Stewardship Council

From: Dan Hoggarth [mailto:Dan.Hoggarth@msc.org]

Sent: 19 January 2015 14:01

To: Adrian Gutteridge; Martin Gill

Cc: ASI; Martin Purves; Carlos Montero

Subject: RE: Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna - PCDR Technical Oversight

Dear Martin,

Further to Adrian's email below, please find attached a revised MSC TO report, including one additional finding, #11215, otherwise as sent in earlier today. Sorry for the late change, but I note this submission is still within today's 5pm deadline.

Best wishes,

Dan

From: Adrian Gutteridge (MSC)

Sent: 17 January 2015 00:52

To: Martin Gill

Cc: Dan Hoggarth; ASI; Martin Purves; Carlos Montero

Subject: Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna - PCDR Technical Oversight

Hi Martin,

Please find attached to this email the technical oversight (TO) that we generated for the Echebastar Indian Ocean purse seine skipjack, yellowfin and bigeye tuna PCDR.

I am aware that Nick Pfeiffer has stepped aside from the role of team leader, however the notification I received did not have an updated email for the new team lead. As such, if you could pass the TO report on to the new lead and confirm that it has been passed on, that would be greatly appreciated.

Thanks for your time.

Adrian

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
9203	Major	222	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 2.5.1– The rationale does not state why a score of 90 was given (i.e., why a partial score was given). Additional information is required to demonstrate how the score was determined.	2.5.1
	FCI Response: The PI has been re-scored from 90 to 80 to,reflect that there is not clear direct evidence that the free school set fishery is highly unlikely to cause ecosystem impacts, but that given the information available and presented it is considered highly unlikely to cause ecosystem impacts.					
9204	Guidance		*N/A v.1.3	(blank)	-Page 260: Appendix 1.3. There are 10 conditions for the fishery, not 9 as is stated. -Page 97: 3.5.5: Some of the language here is hard to follow. It is not clear what this sentence means "Structure of the Kobe plot usually applied in the IOTC and used the Reference point existing, taking account of the following objectives." -Some IOTC citations are missing from the reference list. For example, those presented in PI 1.2.2. for YFT. Please ammend throughout document for all citations to IOTC resolutions etc -Page 34: Table 3.3.4 also includes + or - 40%, so this should be included in the paragraph below the table. -PI 1.2.1 scoring issue c for YFT, page 148. The rationale says "Therefore, although the fishery clearly meets the SG60, it does not meet the SG100." However, there is no SG 100 level for this scoring issue. The reverse is true for scoring issue d, where the rationale states "Therefore, although the fishery clearly meets the SG60, it does not meet the SG100." There is no SG60 level for this scoring issue. Ammend	Guidance

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
					wording in both cases and change for skipjack and bigeye where appropriate. - The general layout of the report has information presented for skipjack, then yellowfin, then bigeye. However, the conditions are presented with yellowfin first. Recommended to align the conditions with the structure of the report.	
	FCI Response: The FCI assessment team has made corrections and edits to the text of the draft report in response to the MSC comments provided above.					
9205	Major	233	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 3.1.1; scoring issue d: The rationale provided is heavily P1 focussed. Additional information or examples are required to explain how the fishery meets the requirement for SG80 in terms of P2.	3.1.1
	FCI Response: Additional information in reference to P2: In recent years various international initiatives are being implemented to improve the health of the oceans and ensure the conservation of natural resources for future generations. In the framework of the United Nations and within the parameters of UNCLOS, has recently launched the OCEAN COMPACT initiative with the goal of achieving "Healthy Oceans for Prosperity". The Compact establishes three objectives: protecting people and improving the health of the oceans; protecting, recovering and sustaining the oceans' environment and natural resources; and strengthening ocean knowledge and the management of oceans. Moreover, the European Union, in the framework of the new Common Fisheries Policy should be based on the precautionary approach which derives from the precautionary principle and a ecosystem based approach to have a sustainable exploitation of marine biological resources and limit the environmental impacts of fishing activities. In the specific context of the Indian Ocean, the IOTC own set different resolutions aimed at protecting the marine ecosystem from the regulation of fisheries and concrete measures on certain groups of marine species that are not targets of the fishery. Cetaceans and turtles among others. The main rules related are: • Resolution 14/02 For the conservation and management of tropical tunas stocks in the IOTC area of competence • Resolution 13/04 On the conservation of cetaceans • Resolution 13/05 On the conservation of whale sharks (Rhincodon typus)						

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
	• Resolution 13/06 On a scientific and management framework on the Conservation of sharks species caught in association with IOTC managed fisheries • Resolution 13/09 On the conservation of albacore caught in the IOTC area of competence • Resolution 12/01 On the implementation of the precautionary approach • Resolution 12/04 On the conservation of marine turtles • Resolution 12/06 On reducing the incidental bycatch of seabirds in longline fisheries • Resolution 12/09 On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence • Resolution 12/10 To promote implementation of Conservation and Management Measures already adopted by IOTC • Resolution 05/01 On Conservation and Management Measures for bigeye tuna					
9206	Major	235	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 3.1.2 scoring issue b: As per the rationale at the 80 level, it is not clear how often the management system regularly seeks and acceptsrelevant information. Additional information is required.	3.1.2
	FCI Response: PI 3.1.2b 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. Consultation processes under management of tropical tuna fishery in the Indian fishery related evaluation, set on two levels: • The first is the IOTC as RFMO reference for this fishery. • The second level is considered the country's flag vessels. In this case, having vessels with flags of Spain and Seychelles, this second level differentiates into two sections. First, the European Union (since it is who represents the interests of Spain in the IOTC) and secondly the Government of Seychelles. In the framework of the IOTC making mechanisms for consultation are clearly identified and meet the needs of scientific information that feeds decision making and the relevance of the latter for adoption. Consultation processes in the IOTC been explained in the justification of this indicator. The IOTC has three levels of integrated consulting the Commission, Committees and Working Parties. The three feed-back and are constituted of representatives of the parts of the Commission. At the level of the European Union, as a member of the IOTC is acts at two levels. On the one hand it is queried from the IOTC as a member for decision-making and on the other, provides consultations with European countries with an interest in the fishery, especially Spain and France.					

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
	Consultation processes of the EU, are clearly established in the framework of the Common Fisheries Policy through different tools. Advisory Councils are perhaps one of the most important systems of these processes. The same way, Seychelles takes part of IOTC meeting and provides relevant information, including local knowledge, about the tuna fisheries in their waters. This information is incorporated in the Resolutions and Recommendations of IOTC. However the national consultation processes are not included in the Fisheries Act as system for obtaining relevant information. But according to information from the SFA, stakeholder consultations are held on a regular basis regarding the development of the sector. The SFA works in close collaboration with Ministry Natural Resources, Ministry of Environment and Energy, Seychelles Coast Guard, Seychelles Ports Authority, other Government institutions, fishermen and boat owners associations, NGO's as well as overseas partners.					
9207	Major	236-238	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 3.1.3: The rationale does not state why a score of 85 was given (i.e., why a partial score was given). Additional information is required to demonstrate how the score was determined.	3.1.3
	FCI Response: Agree with MSC CR CB4.4.1: The team shall interpret management policy to mean outside the specific fishery under assessment (i.e. at a higher level or within a broader context than the fishery-specific management system). Therefore, the CAB considers that, in the context of the overall policy of management of the fishery, there are long-term management objectives in accordance with what is established in MSC CR CB4.4.1 This is not related to the fact that currently reference points and harvest control rules of the three species considered not reach the minimum of SG80 in the evaluation of the principle 1. The IOTC, through resolution 13/10 considered the need to establish reference points and Control harvest rules from an interim reference point identified Therefore, the mechanism of management of the fishery itself provides the necessary measures to establish long term objectives (RP and HCR) for the management of the same, according to the MSC criteria. The same way, through the IOTC Resolution 12/01, is established as management policy of the Organization, the adoption of a precautionary approach to the management of the fishery and the need for RP and set according HCR the advice of scientists. The fact that the fishery has the necessary tools so that they can achieve the objectives of the Principles 1 and 2 of MSC, is crucial to this indicator reaches the SG80. However, since it is still necessary to develop specific measures for each of the species under evaluation for P1 and implement concrete measures to					

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
	meet all the objectives of Principle 2 cannot be considered a score of 100. However, since existing resolutions related to the establishment of RP and HCR well as conservation and protection of certain species groups (among others) is considered that the score is higher than 80.					
9208	Major	238-239	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	Major	3.1.4
	FCI Response: Since the details of the MSC requirement for this indicator are incomplete, the rationale is extended with what has been stated in the answer to IPNLF on the same IP The fisheries agreements the EU should not be considered today as a mechanism to subsidize European fishing vessels. According to current European regulations, fisheries agreements with third countries are based on the capture of surplus coastal countries do not fish and make available to other fleets. In any case, these agreements do not promote overfishing since the total fishing capacity of tropical tuna fishery is regulated by the IOTC. Resolution 12/11 On the Implementation of a limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties. The recently approved Common Fisheries Policy sets the following parameters for the establishment of SFPA. (REGULATION (EU) No 1380/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013) *Article 31* *Principles and objectives of Sustainable fisheries partnership agreements* *1. Sustainable fisheries partnership agreements with third countries shall establish a legal, environmental, economic and social governance framework for fishing activities carried out by Union fishing vessels in third country waters. Such frameworks may include: (a) development and support for the necessary scientific and research institutions; (b) monitoring, control and surveillance capabilities; (c) other capacity building elements concerning the development of a sustainable fisheries policy of the third country.* *2. For the purpose of ensuring the sustainable exploitation of surpluses of marine biological resources, the Union shall endeavour to ensure that the Sustainable fisheries partnership agreements with third countries are of mutual benefit to the Union and to the third country concerned, including its local population and fishing industry and that they contribute to continuing the activity of Union fleets and seek to obtain an appropriate share of the available surplus, commensurate with the Union fleets' interest.* *4. Union fishing vessels shall only catch surplus of the allowable catch as referred to in Article 62(2) and (3) of the UNCLOS, and identified, in a clear and transparent manner, on the basis of the best available scientific advice and of the relevant information exchanged between the Union and the third country about the total fishing effort on the affected stocks by all fleets. Concerning straddling or highly migratory fish stocks, the determination of the resources available for access should take due account of scientific assessments conducted at the regional level as well as conservation and management measures adopted by relevant RFMOs.* *7. Efforts shall be made at Union level to monitor the activities of Union fishing vessels that operate in non–Union waters outside the framework of Sustainable fisheries partnership agreements.* *8. Member States shall ensure that Union fishing vessels flying their flag and operating outside Union waters are in a position to provide detailed and accurate documentation of all fishing and processing activities.*					

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
	Moreover, the new European Maritime and Fisheries Fund (EMFF), no found eligible new operations of shipbuilding, increase or exportation of fishing capacity or creation of fishing joint-ventures. The facts referred to the comment of IPNLF are not present and cannot be considered in the MSC assessment of this fishery.					
9209	Major	240	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 3.2.1: The rationale provided is heavily P1 focussed. Additional information or examples are required to explain how the fishery meets the partial requirement for SG80 in terms of P2. Lastly, here the score is given as a partial score of 70. Other partial scores, e.g. PI 3.1.4, were assigned as 75, 85 etc. It is unclear how the team decided to designate partial scores. Additional information is required to demonstrate how the score was determined.	3.2.1
	FCI Response: Principle 3 describes the mechanism of management of the fishery under consideration in the overall and specific context. In the case of PI 3.2.1, MSC CR CB4.7.1 specifies that "the team must verify that each harvest strategy or management to score in the IC under the Principles 1 and 2 is consistent with the specific objectives of each fishery that are being rated under Principle 3 ". According to the rationale proposed in PCDR consider short and long-term objectives for this fishery are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 and are explicit in the management plan for the fishery. Although we believe that the proposed analysis covers the rationale for Principle 1 is true, as specified IPNLF and MSC comments and the justification for P2 is not sufficiently developed by the CAB. In this sense, despite not been included in the rationale if we consider that there is a set of IOTC Resolutions that establish clearly that there are short and long term consistent with Principle 2. The main rules related are: • Resolution 14/02 For the conservation and management of tropical tunas stocks in the IOTC area of competence • Resolution 13/04 On the conservation of cetaceans • Resolution 13/05 On the conservation of whale sharks (Rhincodon typus) • Resolution 13/06 On a scientific and management framework on the Conservation of sharks species caught in association with IOTC managed fisheries • Resolution 13/09 On the conservation of albacore caught in the IOTC area of competence • Resolution 12/01 On the implementation of the precautionary approach • Resolution 12/04 On the conservation of marine turtles					

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
	• Resolution 12/06 On reducing the incidental bycatch of seabirds in longline fisheries • Resolution 12/09 On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence • Resolution 12/10 To promote implementation of Conservation and Management Measures already adopted by IOTC • Resolution 05/01 On Conservation and Management Measures for bigeye tuna The CAB believes, therefore, that the PI reached in SG70 should be maintained. There are numerous management measures implemented consistent with the views expressed in the SG80 for this indicator. However, it is not considered that all short and long-term objectives that are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, and they are explicit within the fishery's management system.					
9210	Major	242	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 3.2.2: scoring issue b: A general description of the decision making process is provided. However, the rationale does not cover what decisions or processes are included or considered by the IOTC. Additional information is required to justify the score given.	3.2.2
	FCI Response: The difficulty to rate this SI is based on the effective implementation of resolutions and recommendations adopted within the IOTC by all parties. The mechanisms of the IOTC support the conclusion that all issues identified in the fishery are taken into account in the decision making process. However, effective implementation of the same does not always occur at 100%. The IOTC is able to respond effectively to all problems arising from the management but the degree of implementation is not always complete. Therefore, we do not consider this SG reaches the PI 100 but if the SG80 according to the provisions of MSC CR CB4.8 For the Europe Union Seychelles and it is considered that the decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions but not the case for all parts of the IOTC and therefore this SI only reaches SG80					
9211	Major	245-246	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 3.2.3: scoring issue b: Within the report on page 100, the text states "…the level of compliance must be considered low with IOTC measures and obligations but there are currently no sanctions or penalties for non-Compliance in force." This information contradicts the rationale provided for PI 3.2.3 scoring issue b.	3.2.3

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
	FCI Response: There is a mistake in the paragraph on page 100 referred in this reference. Old text: Despite this the level of compliance must be considered low with IOTC measures and obligations but there are currently no sanctions or penalties for non-Compliance in force. New text proposed: Despite this the level of non-compliance must be considered low with IOTC measures and obligations. There are currently no sanctions or penalties for non-Compliance in force. This paragraph explains that, according to information provided by the Spanish Authority, there were no, at the time of the site visit, penalties or sanctions for non-compliance in the entire Spanish fleet in the IOTC.					
9212	Major	248-249	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 3.2.4; socring issue a, The rationale provided is heavily P1 focussed. Additional information or examples are required to explain how the fishery meets SG80 in terms of P2. Also, the link provided for the IOTC SC workplan 2013- 2014 is broken. Thus it is not clear at present what is actually specified in the workplan.	3.2.4
	FCI Response: We consider the rationale for PI3.2.4 is focused both P1 and P2. Thus, any of the various research programs mentioned are not focused only P1 in not in P2 also. » CSIRO Australia: Wealth from oceans » MADE Project » UMR 212 "écosystèmes marins exploités" » CLIOTP global program These research programs include studies on the overall health of the marine ecosystem, by-catch, ETP species among other aspects specifically related to Principle 2 of MSC. In reference to workplan link, currently in not possible use it because there is a new SC WP 2014-2018: **http://www.iotc.org/documents/iotc-science-work-plan-2014%E2%80%9318**					

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9213	Major	250-251	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 3.2.5: scoring issue a: Specific examples are required to meet the SG 80 level for 'mechanisms' that are used to evaluate the management system. At present, the only example provided is "various committees and working groups". This is rather vague and does not provide adequate justification for the score.	3.2.5
	FCI Response: The main mechanism used within the IOTC and to evaluate the management system is the IOTC Performance Review Panel (PRP). It is represented by the IOTC Scientific Committee (SC), the IOTC Compliance Committee (CoC) and the IOTC Standing Committee on Administration and Finance (SCAF). The main goals of this Panel are: • adequacy of the Agreement for the Establishment of the IOTC Agreement relative to current principles of fisheries management; • consistency between scientific advice and conservation and management measures adopted; • effectiveness of control measures established by the IOTC; and • efficiency and transparency of financial and administrative management. Currently, the IOTC is preparing a new review will evaluate progress made on the recommendations arising from the first performance review. In addition it will focus on the effectiveness of the Commission to fulfil its mandate, in accordance to the criteria set forth below. The review will not include an audit of the finances of the Commission. The report of the Review Panel will be completed and made available 60 days prior to the 20th Session of the Commission (2016) and published in the IOTC website The main goals of this Panel are: • adequacy of the Agreement for the Establishment of the IOTC Agreement relative to current principles of fisheries management; • consistency between scientific advice and conservation and management measures adopted; • effectiveness of control measures established by the IOTC; and • efficiency and transparency of financial and administrative management.					
9214	Major		CR-27.10.7.3 v.1.3	27.10.7 In Principle 2, the team shall score PIs comprised of differing scoring elements (species or habitats) that comprise part of a	The report does not specifically state each scoring element's score within the scoring issues for the retained and ETP species' PIs. (This applies to PIs 2.1.1, 2.1.2, 2.1.3, 2.3.1, 2.3.2, and 2.3.3.)	2.1.1, 2.1.2, 2.1.3, 2.3.1, 2.3.2, 2.3.3

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
				component affected by the fishery. 27.10.7.3 Scores should be determined for each scoring element by applying the process in section 27.10.5 to each scoring element		
	FCI Response: The text in the scoring justification for PIs 2.1.1, 2.1.2, 2.1.3, 2.3.1, 2.3.2, and 2.3.3 has been corrected so as to specifically state each scoring elements score within each scoring issue. This has also been accomplished for all the other P2 PIs.					
9220	Guidance	129, 148, 166			The text for SKJ, YFT and BET scoring issue b states: "It is clear from the report of the WPTT that while the harvest strategy may not have been fully tested, none the less, monitoring is in place. Further It is evident from the most recent assessment that for this stock a) the catch is below MSY, b) the stock is overfished." The stock being overfished is not congruent with the scores in PI 1.1.1. Review the information provided and sentence structure for clarity.	1.2.1
	FCI Response: Point b) should read the stock is NOT overfished. The text has been corrected					
10215	Minor	111, 112	CR-27.12.1.7 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.7 The robustness of the management systems	The report does not explain how the management systems are sufficient to track or trace fish and fish product identified as certified. In fact in relation to segregation of freeschool-caught (part of proposed UoC) and FAD-caught (not part of proposed UoC) it states the management systems are not sufficient as follows: 'systems in place for the segregation of certified and non-certified catches do not provide a reliable, practical and verifiably robust means of ensuring that certified and non-certified product is not mixed. This does not support overall traceability in the fishery and undermines the certification, as the	

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
					current system operated does not ensure full traceability. This presents a significant challenge to the fishery in the context of MSC labelling of freeschool caught tuna as there is a high risk of certified product being mixed with uncertified product' This is inconsistent with 5.3 which states that CoC is not required and therefore that the auditor would need to document the sufficient management systems are place.	
	FCI Response: Section 5 of the Final Report details the situation with regard to the management systems that were witnessed to be in place on board the clients vessels at the time of the site visit to the Seychelles, at that time the management systems were not sufficient to ensure the traceability required to allow tuna from the free school units of certification to enter into the supply chain under the MSC logo. As such Section 5 of the Final Report has been amended to clarify that: Free school caught tuna will not be eligible to enter MSC chains of custody until separate MSC CoC certification is obtained by the client beginning at the point of fish being landed on the deck of approved vessels. FCI is aware from communications with the client and another CAB (DNV-GL) that MSC CoC Group certification has been awarded under certificate number MSC–C-54180.					
10216	Minor	111, 112	CR-27.6.2.3 v.1.3	The CAB shall document the rationale for the target eligibility date and include an assessment regarding how the assessed risks to traceability systems in the fishery are adequately addressed by the applicant to give confidence in this date.	The rationale for the target eligibility date (TED) does not consider how the assessed risks to traceability systems in the fishery are adequately addressed to give confidence in the TED. Proposing an eligibility date which is prior to certification is in contradiction with the statement made on page 112 in relation to freeschool catch (part of proposed UoC) and FAD- associated catch (not part of proposed UoC) as follows: "systems in place for the segregation of certified and non-certified catches do not provide a reliable, practical and verifiably robust means of ensuring that certified and non-certified product is not	

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					mixed. This does not support overall traceability in the fishery and undermines the certification, as the current system operated does not ensure full traceability. This presents a significant challenge to the fishery in the context of MSC labelling of freeschool caught tuna as there is a high risk of certified product being mixed with uncertified product." It is not clear how the explicit traceability and segregation risks in the fishery are addressed in choosing a TED prior to certification.	
	FCI Response: The response given above for finding 10215 is relevant to this response. The Actual Eligibility date has been set at 09/12/2014 as per the MSC CoC certificate MSC–C-54180 issued by DNV-GL.					
10217	Minor	111,112	CR-27.12.1.1 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.1 The systems in use.	The report does not explain how the systems to track or trace are sufficient to make sure all fish and fish product identified as certified originate from the UoC. In fact in relation to segregation of freeschool-caught tuna (part of proposed UoC) and FAD-caught tuna (not part of proposed UoC) it states the systems in place are not sufficient as follows: 'systems in place for the segregation of certified and non-certified catches do not provide a reliable, practical and verifiably robust means of ensuring that certified and non-certified product is not mixed. This does not support overall traceability in the fishery and undermines the certification, as the current system operated does not ensure full traceability. This presents a significant challenge to the fishery in the context of MSC labelling of freeschool caught tuna as there is a	

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
					high risk of certified product being mixed with uncertified product'	
	FCI Response: The Final Report has been amended to clarify these points – please see the response to finding 10215					
10218	Minor	112, 114.	CR-27.12.1.3 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.3 The opportunity of substitution of certified with non- certified fish prior to or at landing fraudulent claims from within and outside ther certified fishery.	Section 5.2.3 of the PCDR documents there is a high risk of substitution or mixing of certified fish with non-certified prior to landing, as freeschool tuna (within UoC) and FAD-associated tuna (not within UoC) are caught on the same trip and mixed onboard in holding tanks and it is not possible to distinguish between certified and non-certified catch from this point. This is inconsistent with PCDR section 5.3 which states the fishery does not require its own CoC certificate. Further, CoC needs to start at the point of catch, not first point of landing as stated in 5.3.	
	FCI Response: The Final Report has been amended to clarify these points – please see the response to finding 10215					
10219	Minor	111	CR-27.12.1.5 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.5 Any transhipment activities taking place.	It is not clear from the report if transhipment takes place, and if so how the risks and systems to track and trace are documented. The report includes contradictory statements: 'no transhipment of catches take place' but also 'all transhipments take place in Port Victoria, Seychelles.' The assessment refers to the same vessels catching tuna around FADs (not part of the UoC, and so not certified) and free school (in the UoC, so certified), but the risks and systems in relation to transhipment are not documented.	
	FCI Response: The Final Report has been amended to clarify these points – please see the response to finding 10215					

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
10220	Minor	113, 114	CR-27.12.2 v.1.3	If the CAB determines the systems are sufficient, fish and fish products from the fishery may enter into further certified chains of custody and be eligible to carry the MSC ecolabel. The CAB shall determine: 27.12.2.1 The scope of the fishery certificate, including the parties and categories of parties eligible to use the certificate and the point (s) at which chain of custody is needed. a. Chain of custody certification shall always be required following a change of ownership of the product to any party not covered by the fishery certificate. b. Chain of custody certification may be required at an earlier stage than change of ownership if the team determines that the systems within the fishery are not sufficient to make sure all fish and fish products identified as such by the fishery originate from the certified fishery. c. If the point where chain of custody certification is required is covered by the fishery certificate, the team shall determine the parties or category of parties covered by the fishery certificate that require chain of custody certification.	Section 5.3 of the PCDR contains inconsistent and contradictory statements with regards to CR 27.12.2. It states "currently traceability does not support the certification of any landed catches or the entry into further chains of custody, " yet immediately after that it states "chain of custody should commence following the first point of landing, at which point the product shall be eligible to carry the MSC ecolabel" and that "Pesqueras Echebastar S.A. does not require its own chain of custody certificate." However, the report does not clarify if change of ownership happens at first point of landing and it does not demonstrate that the systems are sufficient for products from the fishery to enter further certified chains of custody. This is particularly relevant in segregation between FAD- caught tuna (not part of UoC) and freeschool tuna (part of UoC), as the report states 'there is a high risk of certified product being mixed with uncertified product'. The report outlines that systems are not sufficient, so it should conclude that products from the fishery may not enter further certified chains of custody nor be eligible to carry the MSC ecolabel - and the CAB should determine if CoC may be required at an earlier stage than change in ownership as per CR 27.12.2.1(b).	

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
	FCI Response: The Final Report has been amended to clarify these points – please see the response to finding 10215					
10221	Minor	113,114	CR-27.12.3.1 v.1.3	If the CAB determines the systems are not sufficient, fish and fish products from the fishery are not eligible to carry the MSC ecolabel. The CAB shall state in its report that fish and fish products from the fishery are not eligible to carry MSC ecolabels.	The report confirms that the traceability systems in the fishery are not sufficient for segregation between FAD-associated catch (not part of intended UoC) and freeschool catch (part of intended UoC). 'There is a high risk of substition or mixing' is stated on page 112. But the CAB does not state fish and fish products from the fishery are not eligible to carry the MSC ecolabel.	
	FCI Response: The Final Report has been amended to clarify these points – please see the response to finding 10215					
11215	Major		CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	The rationale for PI 1.1.1 scoring issue b states that there is a low risk (8.3%) that the stock could fall below SBMSY in the next 6 years, assuming that catches are maintained at 2010 levels. This assumption was based on the 2010 base case assessment for stock projections undertaken by the IOTC. The base case assumes a catch of 276,000 t each year from 2011 to 2020 (the scenario is designated as 100 %). MSC notes that every year since 2010 has seen an increase in yellowfin tuna catch beyond the 2010 level (average 2011-2013 = 376,000 t), and the catch is now in excess of 400,000 t. Given this situation, it is more likely that the projected average catch for each year 2011-2020 will be represented by the figures for 140% of the base case (140% = 386,400 t). At this 140% catch level, the probability of SB2020 < SBmsy = 91.7 %, ie. it is likely that the stock will be reduced to levels below BMSY within the next 6 years. The probability of F2020>FMSY is also estimated to be 100% in this situation	1.1.1

Ref.	Type of Finding	Page	Requirement	Reference	Details	PI
					(not as 8.3% as given in the report, presumably a typographic error for the IOTC estimate of 83.3%).	

FCI Response:

The rationale has been replaced with the following

The current estimate of SB2010/SBMSY = 1.24 [0.91– 1.40]. And while the ASPM model run indicates that the target reference points may have been exceeded during the period of high catches in the mid 2000's (2003–2006), the WPTT agreed that the MFCL assessment, which indicates that fishing mortality is below the limit and target reference points during the whole time series, represents the best view of the stock.

That being said there is concern that total catch has continued to rise with 400,292,t and 402,084 t landed in 2012 and 2013, respectively; well in excess of the previous MSY estimates. Such high yields would only be expected if recruitment corresponds to the longterm average. And while the prevous assessment showed that the stock was unlikely to support substantially higher yields based on the estimated levels of recruitment from the last 15 years catch rates have improved in the purse seine fishery while remaining stable for the Japanese longline fleet. The scientific committee concluded that – for the moment at least – 'it is difficult to know whether the stock is moving towards a state of being subject of overfishing'. They continued, "thus, on the weight of evidence available in 2014, the yellowfin tuna stock is determined to be not overfished and not subject to overfishing. Specifically the scientific committee current fishing mortality is considered to be below the provisional target reference point of FMSY and, current spawning biomass is considered to be above the target reference point of SBMSY.

On the basis of the most recent scientific report, an assessment using Multifan CL indicates that the SB>SBMSY and F<FMSY throughout – 'the stock has been above the MSY reference points in recent years' while another assessment using an Age Structured Production Model (ASPM) indicates that the stock has fluctuated around the target in recent years but is now believed by the scientific committee to be above the MSY reference points.

Hence there is a "high degree of certainty" that the stock has been above the MSY reference points in recent years. Thus, this meets SG100.