An Evaluation of the Sustainability of Global Tuna Stocks Relative to Marine Stewardship Council Criteria

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Executive Summary

The Marine Stewardship Council (MSC) has established a program whereby a fishery may be certified as being sustainable. The sustainability of a fishery is defined by MSC criteria which are embodied in three Principles: relating to the status of the stock, the ecosystem of which the stock is a member and the fishery management system. Since many of these MSC criteria are comparable for global tuna stocks, the MSC scoring system was used to evaluate nineteen stocks of tropical and temperate tunas[1] throughout the world and to evaluate the management systems of the Regional Fishery Management Organizations (RFMOs) associated with these stocks. No evaluation has been made here of the fishery specific ecosystem criteria in this report. The principles that were assessed were:

- Principle 1 (P1): 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, and
- Principle 3 (P3): 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.

Each of these Principles is evaluated in relationship to Performance Indicators (PIs) within each Principle. Additionally, the MSC has established rigorous Guidelines for scoring fisheries (MSC Fishery Standard Principles and Criteria for Sustainable Fishing, Version 2.0 – effective from 1st April 2015; http://www.msc.org/).

Table 1 summarizes the findings of this evaluation.

Of the 19 stocks of tropical and temperate tunas, 6 achieved a passing score for Principle 1. A stock will pass if its overall score is 80 or above, and no single score is less than 60. Failure was due to poor status of the stock, and the lack of well-defined harvest control rules in place. None of the 19 stocks have yet implemented well-defined harvest control rules, although they some progress towards this aim is demonstrated by all RFMOs.

Additionally, the RFMOs also had similar weaknesses but these varied between RFMO (Table 1).

While a future client tuna fishery will be evaluated on the merits related to all three MSC Principles, the scoring clearly outlines a template for actions to improve the management of the 19 tuna stocks through the RFMOs.

[1] The bluefin tunas (Atlantic, Pacific and southern) are specifically excluded from this study.

Table 1 Assessment of Global Tuna Stocks using MSC P1 and P3 Criteria

P1-Atlantic Ocean ICCAT

Component	PI No.	Performance Indicator (PI)	Yellowfin Score	Bigeye Score	Western Skipjack Score	Eastern Skipjack Score	North Albacore Score	South Albacore Score	Med Albacore Score
Outcome	1.1.1	Stock status	70	80	80	80	70	70	60
	1.1.2	Stock rebuilding	80				90	50	50
Management	1.2.1	Harvest strategy	80	80	70	70	80	80	50
	1.2.2	Harvest control rules & tools	60	60	60	60	60	60	50
	1.2.3	Information & monitoring	80	80	65	75	80	80	50
	1.2.4	Assessment of stock status	85	85	85	75	95	85	75
Weighted Principle-level scores									
	Stock rebuilding required?		**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**
		P1 Score:	**75.8**	**77.5**	**73.3**	**73.3**	**79.2**	**<60**	**<60**

P1-Pacific Ocean

Component	PI No.	Performance Indicator (PI)	Western Yellowfin Score	Western Bigeye Score	Western Skipjack Score	Eastern Yellowfin Score	Eastern Bigeye Score	Eastern Skipjack Score	North Albacore Score	South Albacore Score
Outcome	1.1.1	Stock status	100	50	100	80	80	80	80	100
	1.1.2	Stock rebuilding		50						
Management	1.2.1	Harvest strategy	70	60	70	80	80	80	80	80
	1.2.2	Harvest control rules & tools	60	60	60	60	60	60	60	60
	1.2.3	Information & monitoring	80	80	80	80	80	80	80	80
	1.2.4	Assessment of stock status	90	90	85	90	90	80	85	80
Weighted Principle-level scores										
	Stock rebuilding required?		**No**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**
		P1 Score:	**83.3**	**<60**	**82.5**	**78.3**	**78.3**	**76.7**	**77.5**	**83.3**

P1-Indian Ocean

Component	PI No.	Performance Indicator (PI)	Yellowfin Score	Bigeye Score	Skipjack Score	Albacore Score
Outcome	1.1.1	Stock status	90	100	100	50
	1.1.3	Stock rebuilding				
Management	1.2.1	Harvest strategy	70	80	80	60
	1.2.2	Harvest control rules & tools	60	60	60	60
	1.2.3	Information & monitoring	80	80	80	75
	1.2.4	Assessment of stock status	90	85	85	85
Weighted Principle-level scores						
	Stock rebuilding required?		**No**	**No**	**No**	**No**
		P1 Score:	**80.0**	**84.2**	**84.2**	**<60**

PI < 60 or Principle <80: Principle Fails
60 ≤ PI < 80: Condition Needed
PI or Principle≥80: Passing Score
Unscored
Rebuilding Required
Rebuilding Not Required
* Using Default MSC Weighting

P3 by RFMO

Component	PI No.	Performance Indicator (PI)	ICCAT Score	WCPFC Score	IATTC Score	IOTC Score
Governance and Policy	3.1.1	Legal & customary framework	75	95	80	80
	3.1.2	Consultation, roles & responsibilities	75	85	85	75
	3.1.3	Long term objectives	60	80	100	80
Fishery specific management system	3.2.1	Fishery specific objectives	60	80	80	60
	3.2.2	Decision making processes	95	80	85	85
	3.2.3	Compliance & enforcement	75	80	80	70
	3.2.4	Management performance evaluation	80	90	70	100
Weighted Principle-level scores						
		P3 Score:	**73.8**	**84.6**	**83.5**	**78.5**

Foreword

One of the primary objectives of ISSF is to improve the sustainability of global tuna stocks by developing and implementing verifiable, science-based practices, commitments and international management measures that result in tuna fisheries meeting the Marine Stewardship Council (MSC) certification standard without conditions.

The MSC is a global certification program. To date, close to 250 fisheries, including several tuna fisheries, have been certified under the MSC standards. ISSF has been actively involved as a stakeholder in MSC tuna fishery assessments and resulting certifications since 2011.

Through our initial involvement with MSC tuna fishery assessments, we observed that there were often significant inconsistencies among the different tuna assessments as they have been conducted by the Conformance Assessment Bodies (CAB), accredited by ASI to apply the MSC standards. The assessment scores assigned to individual sustainability indicators by CABs in what seem to be very similar situations were sometimes quite different. This could be, at least in part, due to a level of subjectivity allowed by any system. In other cases it could be an incorrect interpretation of the standards and scoring guidance issued by the MSC.

In 2013, we decided to ask two experienced MSC assessors to score 19 tuna stocks against the MSC standards for Principle 1 using the very same indicators of sustainability and the guideposts provided by the MSC to take a global, comprehensive approach for consistent scoring. These 19 stocks represent all of the major commercially-exploited tuna stocks in the world, except those for the three species of bluefin tunas. The scores are not a complete MSC assessment as they are not fishery-specific, i.e. they focus only on stock status (MSC Principle 1) and the international management aspects relevant to Regional Fishery Management Organizations (RFMOs) (part of MSC Principle 3). They do not consider management in national or bilateral jurisdictions, nor gear/fleet-specific ecosystem impacts (MSC Principle 2), which are important components in any complete MSC assessment. Nevertheless, our objective was that this exercise would:

- Provide a basis for comparing between stocks scores that are assigned by the same experts;
- Become a useful source document in future tuna certifications;
- Give a "snapshot" of the current status of the stocks and the strengths and weaknesses of RFMOs.

This document has been updated twice since the initial version, adapting it to new MSC standards and to changing stock status and management situations. We have noted, with satisfaction, that the document has been taken into consideration in recent Full Assessments of tuna fisheries against the MSC standards, or in Fishery Improvement Programs (FIPs) that make use of the MSC scoring principles (although we discourage CABs from considering the scores in this report without consulting the original sources; in a full assessment, much more justification would need to be provided than done here). We believe that this has helped improve consistency in new scores. In addition, the document has served to identify several global shortcomings in tuna management that has led to a more consistent recognition of improvements needed in management of tuna fisheries (for example, the need for adoption of harvest control rules by tuna RFMOs).
We invite you to read *An Evaluation of the Sustainability of Global Tuna Stocks Relative to Marine Stewardship Council Criteria* by Joe Powers and Paul Medley and to make use of it to track the sustainability of the major commercial tuna stocks.

Susan S. Jackson
President, ISSF

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The WWF network provided an extensive review and critique of an early draft of this Version. Their comments, after taken into consideration by the authors, resulted in some changes to the initial scores and additional explanation on the approach the authors have adopted with respect to scoring. Appendix 1 provides a detailed response by the authors to the WWF submission. It is obvious that there is considerable disagreement between WWF and the authors regarding the interpretation of various elements of MSC CR 2.0. We are grateful to WWF for their review.

Version

Pre-assessment Version	Date	Certification Requirements Version
1.0	February 2009	MSC FAMv2
2.0	July 2013	MSC CR 1.3
3.0	March 2015	MSC CR 2.0

Introduction

The Marine Stewardship Council (MSC) has established a program whereby a fishery may be certified as being sustainable. Client fisheries apply for certification and are evaluated by independent certifying bodies according to established sustainability criteria. Once a fishery becomes certified, then they may use the MSC ecolabel and market their certified products accordingly. The sustainability of a fishery using MSC criteria is embodied in the following three Principles:

> Principle 1 (P1): 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 2 (P2): 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.
>
> Principle 3 (P3): 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.

Each of these Principles is evaluated in relationship to Performance Indicators (PIs) within each Principle. Additionally, the MSC has established rigorous Guidelines for scoring fisheries (MSC Fishery Standard Principles and Criteria for Sustainable Fishing, Version 2.0 – effective 1 April 2015; http://www.msc.org/). A stock will pass if its overall score is 80 or above on each Principle, and no single score is less than 60 for any performance indicator. Note that Principle 1 relates to the status of the stocks of the fish that would receive the MSC label. It recognizes that other fisheries may be targeting or impacting the same stock of fish, and therefore the entire stock and all fisheries harvesting that stock are assessed. Principle 2 relates to the performance of the specific fishery relative to all wider ecological impacts. Principle 3 addresses governance at all appropriate levels of management: the fishery, national and international governance.

A number of tuna fisheries around the world have applied for MSC certification (http://www.msc.org/). In some cases, separate certification applications have been made by two fisheries that are targeting the same stock of fish. Additionally, tuna stocks are managed under international agreements through Regional Fishery Management Organizations (RFMOs), this being the highest level of management. Therefore, the evaluation of P1 criteria under MSC and the international aspects of P3 are independent of the particular tuna fishery that is requesting certification. This, in turn, implies that there must be consistency in P1 and P3 in relation to a specific tuna stock or a specific RFMO, regardless of the fishery that might be asking for certification. The goal of this report is to address that consistency by providing MSC P1 scores for 19 stocks of tropical and temperate tunas from around the world for P1 and MSC P3 scores for the four RFMOs.

Also, our P3 scoring only addresses aspects that are related to the RFMO. P3 scoring at the level of the fishery and at the national level is part of the MSC process and these additional requirements would be needed for MSC certification of a fishery. However, this report only presents scores for Principle 3 in relation to the international level. These may be adjusted based on performance of the unit of certification. But, unless clear justification is provided, we would expect scores for each performance indicator not to deviate much from the ones given here.

Many issues related to management are based on individual State performance. For example, monitoring control and surveillance depends on State performance since the RFMO has no direct enforcement role, but co-ordinates international action. It is also important to note that some artisanal fisheries are exempt from many Conservation and Management Measures (e.g. Maldives and east African nations). Countries may also be able to submit a reservation against a Conversation

and Management Measure or simply not implement it. It each case, the effect of this will need to be assessed particularly if the unit of certification is directly affected.

This report is a pre-assessment and does not follow all full assessment procedures. Stakeholders have not been fully consulted and information on these fisheries may therefore be incomplete, although only publicly available information can be used in scoring, even in a full assessment. The MSC scoring methodology has been followed as closely as possible to indicate what likely scores would be, but scores may change in a full assessment as new information becomes available.

The report is organized by management authority: the Atlantic/Mediterranean, Western Pacific, Eastern Pacific and Indian Oceans; and by the relevant RFMOs for these Oceans (Table 2): the International Commission for the Conservation of Atlantic Tunas (ICCAT), the Inter-American Tropical Tuna Commission (IATTC), the Western and Central Pacific Fisheries Commission (WCPFC) and the Indian Ocean Tuna Commission (IOTC).

Table 2 Membership in Tuna RFMOs (December 2014). (M=Member, C=Cooperating non-Member, P=Participating Territory).

Country	IATTC	ICCAT	IOTC	WCPFC	Country	IATTC	ICCAT	IOTC	WCPFC
Albania		M			Mauritania		M		
Algeria		M			Mauritius			M	
American Samoa				P	Mexico	M	M		C
Angola		M			Morocco		M		
Australia			M	M	Mozambique			M	
Barbados		M			Namibia		M		
Belize	M	M	M	C	Nauru				M
Bolivia	C	C			New Caledonia				P
Brazil		M			New Zealand				M
Canada	M	M		M	Nicaragua	M	M		
Cape Verde		M			Nigeria		M		
China	M	M	M	M	Niue				M
Chinese Taipei	M	C	*[1]	M	Norway		M		
Colombia	M				Oman			M	
Comoros			M		Pakistan			M	
Cook Islands				M	Palau				M
Costa Rica	M				Panama	M	M		C
Cote d'Ivoire		M			Papua New Guinea				M
Croatia					Peru	M			
Curacao		M			Philippines		M	M	M
Djibouti			C		Russia		M		
Ecuador	M			C	St. Pierre and Miquelon (France)		M		
Egypt		M			Samoa				M
El Salvador	M	M		C	Sao Tome and Principe		M		
Equatorial Guinea		M			Senegal		M	C	
Eritrea			M		Seychelles			M	
European Union	M	M	M	M	Sierra Leone		M	M	
Fiji				M	Solomon Islands				M
France	M		M	M	Somalia			M	
French Polynesia				P	South Africa		M	C	
Micronesia, Fed. States				M	Sri Lanka			M	
Gabon		M			St. Kitts and Nevis				
Ghana		M			St. Vincent & the Grenadines		M		
Guam				P	Sudan			M	
Guatemala	M	M			Suriname		C		

Country	IATTC	ICCAT	IOTC	WCPFC	Country	IATTC	ICCAT	IOTC	WCPFC
Guinea Rep.		M	M		Syria		M		
Guyana		C			Tanzania			M	
Honduras	C	M			Thailand			M	C
Iceland		M			Tokelau				P
India			M		Tonga				M
Indonesia	C		M	M	Trinidad and Tobago		M		
Iran			M		Tunisia		M		
Japan	M	M	M	M	Turkey		M		
Kenya			M		Tuvalu				M
Kiribati	M			M	United Kingdom (Overseas Territories)		M	M	
Korea, Republic of	M	M	M	M	United States	M	M		M
Korea, Dem. P. Rep.				C	Uruguay		M		
Liberia	C	M			Vanuatu	M	M	M[2]	M
Libya		M			Venezuela	M	M		
Madagascar			M		Vietnam				C
Malaysia			M		Wallis and Futuna				P
Maldives			M		Yemen			M	
Marshall Islands				M					

[1]Under the UN system, the IOTC Agreement currently inhibits the full involvement of Chinese Taipei in the Commission. However, individuals from Chinese Taipei participate in IOTC meetings as Invited Experts.
[2]In December 2014, Vanuatu has notified IOTC of its intention to withdraw its membership.

There are 19 tropical and temperate tuna stocks that are evaluated in this report. No attempt was made to evaluate Southern, Atlantic and Pacific bluefin tunas. The 19 stocks and their relevant RFMOs are:

Atlantic Ocean	Pacific Ocean		Indian Ocean
ICCAT	WCPFC	IATTC	IOTC
Atlantic Yellowfin (YFT)	Western YFT	Eastern YFT	YFT
Bigeye (BET)	Western BET	Eastern BET	BET
Western Atlantic Skipjack (SKJ)	Western SKJ	Eastern SKJ	SKJ
Eastern Atlantic Skipjack (SKJ)			
North Atlantic Albacore (ALB)	North Pacific ALB[1]		ALB
South Atlantic Albacore (ALB)	South Pacific ALB[1]		
Mediterranean Albacore (ALB)			

[1] Pacific albacores are managed jointly

Scores for P1 were given to each of these 19 stocks using the MSC Default Assessment Tree (http://www.msc.org/). MSC assessments have already occurred for several of the tuna stocks, but these have used previous MSC methodologies. This is the first time MSC CR version 2.0 has been

applied and tuna fisheries have been undergoing changes, so scores will change with respect to previous versions of this document.

MSC guidelines for Performance Indicator scores, the justifications for scores and the scores, themselves, are given. In many cases the scoring and justifications are redundant. For example, the actions taken by an RFMO relating to a number of P1 and P3 Performance Indicators are universal to all tuna stocks under their jurisdiction. Nevertheless, we chose to include these redundancies. By doing so the report will provide a template for a "living" document that can be more readily updated as new stock assessments become available and as actions taken by the relevant RFMOs evolve.

Additionally we used the following shading codes for the scoring key:

Scoring Key

Scoring tables are shaded to indicate the Guideposts that have been met. For example in the table below the 60 and 80 Guideposts are met; whereas the 100 Guidepost is not.		
60 Guidepost	80 Guidepost	100 Guidepost

Some Notes on Scoring to MSC CR 2.0

The new scoring system introduced in 2015 has made some changes to the scoring methodology. Most substantive changes have taken place in Principle 2, which is not used here. However, one performance indicator from Principle 1 and two from Principle 3 were dropped, some scoring guideposts were changed and additional guidance was provided to interpret the scoring guidepost text. The objective of these changes was not to alter the standard, but to continue to improve consistency in its definition and application across the wide variety of fisheries that are seeking certification.

For Principles 1 and 3 the following changes occurred:

- The performance indicator for reference points was removed, and these requirements incorporated in the status (PI 1.1.1) and harvest control rule (PI 1.2.2) requirements. The net result of this change was to remove one of the conditions on most tuna fisheries that required a limit reference point. There is now no such requirement, but it is necessary to define a point of recruitment impairment (PRI). In addition, it is not clear that the definition of maximum sustainable yield used by MSC is consistent with its use in many tuna stock assessments, which may not be taking full account of uncertainties. As this issue is now incorporated into PI1.1.1, the inconsistency can result in an outright failure of the stock to meet MSC requirements rather than a condition on a performance indicator for reference points, as used to be the case.
- The performance indicator for the harvest control rule (PI1.2.2) did not change except for the additional guidance. None of the tuna fisheries have yet implemented a well-defined harvest control rule, and therefore they have difficulty scoring above 60, the minimum requirement to pass MSC certification. The additional guidance indicated the type of evidence required to meet the 60 scoring guidepost, which included controls applied on other fisheries within the management jurisdiction that can demonstrate that management can and will apply such controls when they are needed. However, for tuna RFMOs, in common with other fisheries jurisdictions, management is mixed with adequate responses in some cases and inadequate in others. For consistency with past scoring and because all RFMOs have demonstrated an ability to limit fishing mortality on stocks considered in this report, scores of 60 have been allocated for most stocks on performance indicator 1.2.2. However, it should be noted that well-defined harvest control rules must be implemented within 5 years of the first fishery being certified for a particular stock. If this is not achieved, the certificates for all fisheries on that stock are likely to be suspended. Therefore, given the slow pace of change, it is quite likely that this performance indicator will cause certificates to fail in future unless well-defined harvest control rules are implemented.
- Principle 3 lost two performance indicators concerning incentives for sustainable fishing and a requirement for a research programme. This somewhat simplified the scoring methodology for this principle, but otherwise left it comparatively unchanged.

Scoring PI 1.2.2 on harvest control rules at the SG60 level continues to be problematic (see Appendix 1). To be clear, we have applied the following scoring approach to this performance indicator, while recognising that in a full MSC assessment, the assessors would have to reach their own conclusions on this matter.

Firstly, while there is no well-defined harvest control rule (HCR), we recognised a generally understood one (PI 1.2.1a). Evidence for this is given by scientific advice and other documentation which is using this rule to provide advice and evaluations. The rule itself is determined by interpretations of various RFMO texts defining management objectives. Because it is possible to evaluate whether or not the management system is following this rule, as demonstrated by criticism in the performance reviews, the HCR exists.

Secondly, there is some evidence that management controls “available” to tuna RFMOs can be used to control exploitation (PI 1.2.1c). Seasonal area closures, effort limitations and catch limits can be applied by flag states on a significant proportion, but not all, fleets. However, whether these are truly “available” in all cases is at best equivocal. The problem is that in practice, when it may become necessary to apply effective controls, the decision may be rather to delay implementation, possibly indefinitely, for socio-economic or political reasons, which are not stated or explained.

A possible lack of will by member states to agree implementation of effective controls makes scoring difficult. In an international context, sovereign states always reserve the right to act in their own interests and conflicts of these interests between states can always prevent or delay action. In this sense, controls may not in reality be “available”. If it is decided that there is no evidence that controls are available to control exploitation because states may not implement them, it would take considerable evidence to reverse this view. Either RFMOs would need to build up a track record of implementation (for example, as in CCAMLR), or there would need to be a binding agreement to follow a well-defined harvest control rule. If this were possible to achieve at some point in the future, the fishery would most likely meet SG80 straight away, so SG60 essentially becomes undefined for these fisheries. Any scoring less than SG60 would be contagious, causing all fisheries within a jurisdiction to fail until such time they could demonstrate an ability to control exploitation.

Therefore, for consistency with previous scoring, we have scored 60 on the HCR performance indicator. We recognise this may be optimistic and recommend careful evaluation in a full assessment. However, we have also noted that a lack of action will cause fisheries eventually to fail anyway on other performance indicators (PI 1.1.1, 1.1.2 and 1.2.1) as well as on the overall score.

It is also important to note that correct implementation of the MSC methodology on conditions requires that the condition be met, or at least demonstrable progress can be made, within the life time of the certificate. If it cannot be clearly demonstrated that significant progress will be achieved in developing and implementing HCRs, then the fishery cannot be certified. We would recommend that more consideration is given to conditions and their implementation in a full assessment and that if conditions are implemented correctly, there would be considerably less contention in the HCR scoring issues.

Principle 1: Sustainable fish stocks

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.

ICCAT Stocks

1.1 Outcome

1.1.1 Stock Status: The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.

1.1.1.a Stock status relative to recruitment impairment.		
60 Guidepost	80 Guidepost	100 Guidepost
It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.

Atlantic Bigeye

The best estimate of stock size indicates that the stock was approximately 100% of the B_{MSY} level in 2009, which is highly likely to be above the point where recruitment would be impaired – the default value for this being around 50% of the B_{MSY} level. This meets SG80, but it does not meet SG100. There was considerable uncertainty as to where recruitment would be impaired and the point estimate of current biomass was not high enough (i.e. not above the MSY level) to meet SG100.

Atlantic Yellowfin

The best estimate of stock size indicates that the stock is approximately 85% (61-112 80% CI) of the B_{MSY} level in 2010. The lower 10 percentile estimate is based on a non-parametric bootstrap. The default value for the PRI is taken here to be 50% of the B_{MSY} level (GSA 2.2.3.1). Therefore there is at least a 90% probability that the true status of the stock is higher than the point at which there is an appreciable risk of recruitment being impaired, meeting SG80 (SA2.2.1).

Eastern Atlantic Skipjack

The best estimate of the Eastern Atlantic skipjack stock size indicates that the stock is most likely above the B_{MSY} level in 2013, which is highly likely to be above the point where recruitment would be impaired – the default value for this being around 50% of the B_{MSY} level. This meets SG80.

However, there is considerable uncertainty over the information used in the determination of stock status. The SCRS believed that it was not in a position to provide a reliable estimate of the maximum

sustainable yield and therefore nor provide advice on the state of the eastern stock beyond general observation that biomass was likely to be above MSY point (and therefore highly likely to be above PRI). As a result it is not possible to state that there is a high degree of certainty recruitment is not impaired so that SG100 is not met.

Western Atlantic Skipjack

The best estimate of the Western Atlantic skipjack stock size indicates that the stock is most likely above the B_{MSY} level in 2013, which is highly likely to be above the point where recruitment would be impaired – the default value for this being around 50% of the B_{MSY} level. This meets SG80.

However, there is considerable uncertainty over the information used in the stock assessment. For example, the stock structure remains uncertain. As a result it is not possible to state that there is a high degree of certainty recruitment is not impaired so that SG100 is not met.

North Atlantic Albacore

The assessment indicated that the stock has remained overfished with SSB below B_{MSY} since the mid-1980s, but has improved since the lowest levels around 30% in the late 1990s, and B_{2011} is approximately 94% of B_{MSY}. Stock status is uncertain, since different models and assumptions provide a wide range of B/B_{MSY} and F/F_{MSY} estimates, but most of them agree with SSB decreasing since the 1930s and recovering since the mid-1990s. Overall, the results suggested that the stock was not undergoing overfishing ($F_{2011}<F_{MSY}$), but the spawning stock biomass ($B_{2011}<B_{MSY}$) was overfished in 2011.

Estimates of recruitment to the fishery, although variable, have shown generally higher levels in the 1960s and earlier periods with a declining trend thereafter. This would seem unlikely to be caused directly by fishing since the stock has been increasing in recent years. It may still, however, indicate a long-term decline in stock productivity.

Therefore the stock is now highly likely to be above the level where recruitment would be impaired, meeting SG80, but given the uncertainties with the stock assessment, this cannot be determined with a high degree of certainty.

South Atlantic Albacore

The median estimate of stock size indicates that the South Atlantic albacore stock was approximately 92% of the B_{MSY} level (95% confidence interval= 55-159%) in 2011, which is highly likely to be above the point where recruitment would be impaired – the default value for this being around 50% of the B_{MSY} level.

Mediterranean Albacore

The SCRS concluded that the ratio of F_{2010}/F_{MSY} is less than or equal to 1, and therefore overfishing is probably not occurring. However, SCRS also concluded that the ratio of B/B_{MSY} cannot be estimated with the available data, and therefore it is not known if the stock is overfished. The assessment used

to determine the status of the stock in relation to F_{MSY} takes an average of the size composition repeated over a number of years, so that the status is determined on the ratio of smaller to larger fish. The presence of a relatively high proportion of larger fish suggests the stock is likely to be above the point where recruitment is impaired, meeting SG60. The reliability of the methods and data to develop this determination is dealt with elsewhere.

The stock status is poorly known, but there is no evidence that the stock is overfished with respect to recruitment and on balance SG60 is met. However, this determination is not rigorous and doubt remains as to the past, present and future recruitment for this stock. It is not therefore "highly likely" to be above any point where recruitment might be impaired.

1.1.1.b Stock status in relation to achievement of Maximum Sustainable Yield (MSY).		
60 Guidepost	80 Guidepost	100 Guidepost
	The stock is at or fluctuating around a level consistent with MSY.	There is a **high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.

Atlantic Bigeye

Based on the 2010 assessment which considers catch, size and effort since the 1950s, it was likely that the stock is around the maximum sustainable yield (MSY) level in 2009, while fishing mortality rate is about 95% of F_{MSY}. Catches have recently been at an appropriate level, and have declined from 84365t in 2009 to 78456t in 2012 and 63037t in 2013. This should have allowed the stock to continue to rise above the MSY level. The stock will only meet SG100 if it continues to rise and remains close to or above the MSY level for the next five years. This might be determined in the next stock assessment planned for 2015.

Atlantic Yellowfin

Based on the 2011 assessment which considers catch, size and effort since the 1950s, it is likely that the stock was below the maximum sustainable yield (MSY) level in 2010 (85% B_{MSY}), while fishing mortality rate was about 87% of F_{MSY}. Therefore, the stock as of 2010 was rebuilding to take it back to the target level (above MSY), although the stock status was determined to be lower than the previous assessment in 2007.

Since the last stock assessment, the total catch has remained below the estimated MSY (114 200 - 155 100t), varying between 96582t in 2007 up to 120 429t in 2009, but have remained below 113000t in more recent years, falling to 92465t in 2013 . Stock assessment projections suggest that the stock size is likely to be increasing, but this would need to be confirmed through on-going monitoring.

Eastern Atlantic Skipjack

Based on the 2014 assessment which considers catch and effort since the 1950s, it is likely that the Eastern skipjack stock was above the maximum sustainable yield (MSY) level in 2012. Therefore, based on the available information, the stock appears to be within its target region, above B_{MSY}, and has been since data has been recorded for this fishery. This meets SG80.

The stock assessment and the data on which it is based are not reliable enough to indicate there is a high degree of certainty the stock is above B_{MSY}, so SG100 is not met.

Western Atlantic Skipjack

Based on the 2014 assessment which considers catch and effort since the 1950s, it is likely that the Western skipjack stock was above the maximum sustainable yield (MSY) level in 2013. Overall the various assessment models results indicate that the stock is unlikely to be overexploited. For the apparently most favoured assessment model (ASPIC), biomass relative to B_{MSY} at the beginning of 2014 was estimated to be 1.28 (1.21-1.33) and the fishing mortality in 2013 relative to F_{MSY} to be 0.69 (0.64-0.76). More broadly, none of the available stock status indicators suggest that this stock is below MSY. Therefore, based on the available information, the stock appears to be within its target region, above B_{MSY}, and has been since data has been recorded for this fishery. This meets SG80.

The stock assessment and the data on which it is based are not reliable enough to indicate there is a high degree of certainty the stock is above B_{MSY}. Therefore, SG100 is not met.

North Atlantic Albacore

Based on the 2013 assessment which considers catch, size and effort since the 1950s, it is likely that the stock was a little below the maximum sustainable yield (MSY) level in 2011, while fishing mortality rate was likely well below F_{MSY}. Since 2011, catches have been 25680 and 24550t, below the estimated MSY of 31680t, so the stock can be expected to continue to increase. However, the stock has been determined to be below B_{MSY} since the 1970s and is currently rebuilding, so the SG80 is not achieved.

South Atlantic Albacore

Based on the 2013 assessment which considers catch, size and effort since the 1950s, it is likely that the stock was below the maximum sustainable yield (MSY) level in 2011, while fishing mortality rate was about 104% of F_{MSY}. Since 2005, catches have been between 18867t and 25060t, and generally below the estimated MSY of 25228t (80% confidence interval: 19109 - 28360t). This is generally consistent with the previous assessment in 2009. Therefore, while recent catches have most likely been at an appropriate level to allow the stock to recover, catches have exceeded prudent levels in the past and the stock requires some rebuilding to take it back to the target level. Because recovery is incomplete, SG80 is not met.

Mediterranean Albacore

The state of the stock in relation to any target is not known, so it is not possible to determine where the stock is in relation to target levels. Therefore SG80 is not met.

Scoring for 1.1.1

Atlantic Bigeye: All SG60 and SG80, but no SG100, are met. 80

Atlantic Yellowfin: All SG60 and 1 out of 2 SG80 are met. 70

Eastern Atlantic Skipjack: All SG60 and SG80, but no SG100, are met. 80

Western Atlantic Skipjack: All SG60 and SG80, but no SG100, are met. 80

North Atlantic Albacore: All SG60 and 1 out of 2 SG80 are met. 70

South Atlantic Albacore: All SG60 and 1 out of 2 SG80 are met. 70

Mediterranean Albacore: All SG60, but no SG80, are met. 60

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1.1.2 Stock Rebuilding: Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe.

1.1.2.a Rebuilding timeframes		
60 Guidepost	80 Guidepost	100 Guidepost
A rebuilding timeframe is specified for the stock that is the **shorter of 20 years or 2 times its generation time**. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock.

Atlantic Yellowfin

The stock is depleted (defined as the biomass below the MSY level) and a strategy is being applied. The main constraint on fishing operations is the requirement to reduce fisheries targeting bigeye tuna. Yellowfin is caught alongside bigeye both in the surface fisheries (smaller, younger bigeye and yellowfin) and longline. There is now a TAC in place to limit catches of yellowfin to 110 000t unallocated by country. Limiting fishing mortality to a level which will allow recovery of bigeye should also allow recovery of yellowfin.

Based on the simulation modelling and at the current levels of catch, the stock should rebuild by 2016 (>60% probability) if catches remain at or below 110000t, which has so far been the case since 2010. The recent reduction in yellowfin catches from the 2001 high and subsequent recovery of yellowfin stock to just below the MSY reference point would suggest that the current strategy should be working, although it is primarily directed at bigeye tuna. Therefore, the current approach seems at least adequate, given the level of monitoring. The attempts to reduce small bigeye tuna catches are considered in PI 1.2.1.

Catches have demonstrably remained below the MSY estimate, and below the catch required to rebuild the stock above B_{MSY} based on the projection. Catches have remained well below 130 000t, which suggests the stock should have risen above B_{MSY} since 2006. This was based on a model projection, but was not confirmed through the most recent stock assessment. The stock recovery is not strongly supported by the available abundance indices, and there is no clearly defined time frame, so SG100 is not met.

North Atlantic Albacore

The stock is depleted (defined as the biomass below the MSY level) and a strategy is being applied. This is to limit catches to a level which will allow recovery. The TAC was set for 2008 and 2009 at 30200t [Rec. 07-02] and the TAC was set from 2010 at 28000t [Rec. 09-05]. This is below the latest MSY estimate (31680t).

Projections at the current TAC level (28 000 t) indicate that the stock would rebuild by 2019 with 53% probability, which would meet the objective of the albacore recovery plan (Rec. 13-05). The recovery of the stock with similar probabilities would be faster (by 2016) if the catches remain at the level of recent catches (around 20 000 t). Assuming a conservative generation time of around 6 years, recovery is required within 12 years for SG60 (by 2026) and 6 years for SG100 (by 2020). This clearly meets SG60. It also ostensibly meets SG100. However, this is only because this scoring is being undertaken close to completion of the rebuilding plan. Given the stock rebuilding has essentially been taking place over a considerable period since the mid-1990s, the rebuilding timeframe has not been the shortest practicable and therefore SG100 is not met.

South Atlantic Albacore

The stock has been depleted (defined as the biomass below the MSY level). Catches are being limited to a level which will allow recovery. In 2013 the Commission established a new TAC of 24000t for 2014-2016 [Rec. 13-06]. Since 2004, reported catches remained below 24000t, except in 2006, 2011 and 2012, where reported catches were slightly above this value. Considering the whole range of stock assessment scenarios considered, the MSY ranged between 19109t and 28360t, B/B_{MSY} ranged between 0.71 and 1.26 and F/F_{MSY} was ranged between 0.38 and 1.32. Based on median estimates, the stock size showed a small increase in B/B_{MSY} from 88% to 92%. However, if F/F_{MSY} remains above 1.0, then the stock will not recover to MSY, or only recover very slowly. Considering all stock assessment scenarios, SCRS found that there is 57% probability for the stock to be both overfished and experiencing overfishing.

Although the recent stock assessment indicates that there is almost a 50% probability the stock will increase above the MSY level, there is a slightly larger probability it will remain at the current level or even decrease. Because rebuilding is not assured, SG60 is not met.

Mediterranean Albacore

If PI 1.1.1 is scored lower than SG80, PI 1.1.2 must be scored (CR2.0 GSA2.3).

The stock is not highly likely to be above the PRI, and its status in relation to MSY is not known. Therefore, it is not known whether rebuilding is required, or not, or if rebuilding is required how long it would take. Therefore SG60 is not achieved.

1.1.2.b Rebuilding evaluation		
60 Guidepost	80 Guidepost	100 Guidepost
Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is **evidence** that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.	There is **strong evidence** that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.

Atlantic Yellowfin

No rebuilding time frame is specified by the management authority, but projections by scientists run from 2011 to 2025. As a result, it is assumed that rebuilding is specified to be 10 years or less. Based on age at first maturity the generation time should be between 5-10 years. Assuming 110 000t catch or less, the projections indicated that the stock should rebuild (> B_{MSY}) by 2020 with a probability exceeding 70%. This meets SG80.

There is no evidence that the catch is being limited so that the shortest practicable rebuilding time frame would be reached. The next stock assessment is not expected until 2015. As indicated in PI 1.2.1, yellowfin recovery is dependent on the harvest strategy to protect bigeye. Overall, the evidence for the expected rebuilding is not strong, and SG100 is not met.

North Atlantic Albacore

There is strong evidence that the stock is being rebuilt and that this is likely to be achieved by 2020. There is evidence that the stock has been increasing since 2000. Probability projections of the base case model and sensitivities indicate that this rebuilding will continue, particularly if catches remain at recent levels. Since the establishment of the TAC in the year 2001, the catch has remained substantially below the TAC in all but two years, which might have accelerated rebuilding over the last decade. This is supported by a range of stock assessment models and sensitivity analysis. This achieves SG100.

South Atlantic Albacore

No rebuilding time frame is specified by the management authority, but projections were run from 2014 to 2026. As a result, it is assumed that rebuilding is specified to be 10 years or less. Based on age at first maturity the generation time should be between 5-10 years.

The stock status and catches relative to the TAC are being monitored, so it will be possible to determine whether the current catch limit is effective. This meets SG60.

Assuming 24000t catch or less, the projections indicated that the stock may be rebuilt (> B_{MSY}) before 2026. Recent catches in 2011 and 2012 were above 24000t, so the TAC limit will need to be enforced. In addition, the assessment projections now suggest that if catches are not below 24000t, rebuilding is not likely (probability of $B>B_{MSY}$ by 2026 < 70% probability) and therefore the SG80 is not met.

Mediterranean Albacore

As for 1.1.2a, because the stock status in relation to MSY is not known, monitoring is currently inadequate to determine whether any rebuilding strategies, if required, would be effective. Therefore SG60 is not achieved.

Scoring for 1.1.2

Atlantic Yellowfin: All SG60 and SG80, but no SG100, are met. 80

North Atlantic Albacore: All SG60 and SG80 are met, and 1 out of 2 SG100 are met. 90

South Atlantic Albacore: Only 1 out of 2 SG60 are met. 50

Mediterranean Albacore: The SG60 are not met. 50

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1.2 Harvest Strategy (Management)

1.2.1 Harvest Strategy: There is a robust and precautionary harvest strategy in place.

1.2.1.a Harvest strategy design		
60 Guidepost	80 Guidepost	100 Guidepost
The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.

Atlantic Bigeye

ICCAT's objective is embedded in the preamble of its Convention finalised in 1966. The preamble states: "The Governments (…) considering their mutual interest in the populations of tuna and tuna-like fishes found in the Atlantic Ocean, and desiring to cooperate in maintaining the populations of these fishes at levels which will permit the maximum sustainable catch for food and other purposes". ICCAT's objective is therefore to maintain populations of tunas and tuna-like fishes at levels that will permit maximum sustainable yield (MSY).

ICCAT, being a regional organisation, provides a forum where the various countries exploiting tunas can work together to implement the strategy to meet this objective. The current strategy is to limit catches to sustainable levels based on a feedback process implemented by the Commission and reduce bycatch of small bigeye tunas. Scientific advice is provided and a TAC with a seasonal closed area agreed through this process, which therefore also includes evaluation of, and adaptation to, changing circumstance.

The 2008 external review panel found that the objectives of ICCAT appeared to be met for 4 of the 14 stocks examined (29%), which included bigeye and yellowfin tuna. However, it is noticeable that recent changes appear to have been made to the seasonal closure without reference to scientific advice, rendering this management action less effective. The external review panel indicated that they thought more effective measures were needed to deal with the catch of small bigeye tuna. Although there have been significant changes in the average size of bigeye tuna caught since 2004 by certain fleets, it still cannot be ascertained whether these changes were the result of spatial closures. The designed aspect of the strategy to change overall selectivity therefore cannot be given full credit.

Atlantic Yellowfin

ICCAT's objective is embedded in the preamble of its Convention finalised in 1966. The preamble states: "The Governments (…) considering their mutual interest in the populations of tuna and tuna-like fishes found in the Atlantic Ocean, and desiring to cooperate in maintaining the populations of these fishes at levels which will permit the maximum sustainable catch for food and other purposes". ICCAT's objective is therefore to maintain populations of tunas and tuna-like fishes at levels that will permit maximum sustainable yield (MSY).

The current strategy is to limit catches to sustainable levels based on a feedback process implemented by the Commission and to reduce bycatch of small bigeye tunas. Scientific advice is provided and a TAC with a seasonal closed area agreed through this process, which therefore also includes evaluation of, and adaptation to, changing circumstance. The 2008 external review panel found that the objectives of ICCAT appeared to be met for 4 of the 14 stocks examined (29%), which included bigeye and yellowfin tuna. However, changes were made to the seasonal closure without reference to scientific advice, rendering this management action less effective. This has since 2008 been corrected, but the designed aspect of the strategy to change overall selectivity can only be given limited credit. A more finely tuned strategy may be difficult to design due to the relatively blunt nature of international controls.

For yellowfin, the strategy depends on the relative selectivity of the different fishing methods between yellowfin and bigeye tunas. While multispecies aspects of the catches have been explored in various analyses, there is no cohesive designed strategy to jointly manage and monitor the stocks. The reliance is on responding to detected problems rather than designing an approach to optimize the fisheries across the various stocks.

Therefore, a responsive harvest strategy has been developed that appears to be succeeding in achieving target stock levels, meeting SG80. However, the strategy being partly a side-effect of bigeye management and being relatively imprecise cannot be considered designed and therefore does not meet SG100.

Eastern Atlantic Skipjack

The current hypothesis of two independent skipjack stocks (East and West) is probably adequate for current management purposes, but the stock fishery indicators, and probably future stock assessments, may be improved if based on smaller more homogeneous areas.

The current strategy relevant to skipjack is to limit catches to sustainable levels based on a feedback process implemented by the Commission and to reduce bycatch of small bigeye tunas. There is currently no specific regulation in effect for skipjack tuna. Because the Eastern stock status was considered above the MSY reference point, no management recommendations were made by the Scientific Committee except catches should not be allowed to exceed the level of catch in recent years. Currently catches are estimated to be below MSY, and are constrained by controls on bigeye bycatch.

With the aim of protecting juvenile bigeye tuna, French and the Spanish boat owners voluntarily decided to apply a moratorium for fishing under floating objects between November and the end of January for the 1997-1998 and 1998-1999 periods, and a similar moratorium was then extended by the Commission to January 2005. This moratorium has been shown to reduce skipjack catches, although it also coincides with reductions in fishing effort.

Although a side-effect of controls on bigeye tuna catches, the harvest strategy appears effective for skipjack. It is consistent with the multispecies nature of much of these fisheries, and appears likely to achieve management objectives, meeting SG60. Although more advanced than the Western skipjack harvest strategy, it still has a number of anomalies making it difficult to see how the different elements work together. The seasonal closure has changed to cover only 7.5% of the historical purse seine catch and the closure was originally changed without scientific advice. Furthermore, there is no specific skipjack control such as a TAC, the assumption being that controls on bycatch are adequate. While this is expected to be true, a more directed feedback and control is required to meet SG80.

Western Atlantic Skipjack

The current strategy relevant to skipjack is to limit catches to sustainable levels based on a feedback process implemented by the Commission and to reduce bycatch of small bigeye tunas. There is currently no specific regulation in effect for skipjack tuna. Because the Western stock status was considered above the MSY reference point, no management recommendations were made by the Scientific Committee except that catches should not be allowed to exceed MSY. Between 2001 and 2010, catches have been reported as below 30 000t, a conservative estimate of the MSY. In 2011 and 2012, catches have exceeded 30 000t, although the estimated fishing mortality was below F_{MSY}. Catches above the replacement yield should lead to a decline in biomass towards the MSY level. Even with a decline in stock size, it will likely be several years before the stock approaches the MSY level, if the stock assessment is correct. The Committee also indicated that increasing harvests and fishing effort for skipjack could lead to consequences for the management of other species that are harvested in combination with skipjack in some fisheries (e.g. yellowfin in the Venezuelan purse seine fishery). There appears to be no strategy to manage this for the Western stock.

The Western skipjack stock does not appear to have been a priority for ICCAT, and the current management objectives beyond those defined by the Convention are vague. Limits on fisheries catching bigeye probably do not apply to the Western skipjack stock. Without the limits on fleet activity created by bigeye tuna management recommendations which apply to the Eastern stock,

there appears to be little in terms of strategy for Western stock beyond management responses which might be expected rather than demonstrated. However, it has been agreed to develop harvest control rules for skipjack stocks and some work has been conducted towards this end, but as yet no strategy has been determined. The fisheries meet the SG60, but without clear evidence for a coordinated harvest strategy directed at Western skipjack, SG80 cannot be met.

North Atlantic Albacore

The current strategy is to limit catches to sustainable levels based on a feedback process implemented by the Commission. Scientific advice is provided and a TAC agreed through this process, which therefore also includes evaluation of, and adaptation to, changing circumstance. In 2013, the Commission established a TAC for 2014-2016 of 28 000 t [Rec. 13-05], but included several provisions that allow the catch to exceed this level. There are also intentions to reduce bycatch of bigeye tuna in some gears and limits on overall fishing capacity. This meets SG80. However, the strategy has been relatively imprecise and lacks a range of components including defining an appropriate mix of capacity by gear types, so it cannot be considered designed and therefore does not meet SG100.

South Atlantic Albacore

The current strategy is to limit catches to sustainable levels based on a feedback process implemented by the Commission. Scientific advice is provided and a TAC agreed through this process, which therefore also includes evaluation of, and adaptation to, changing circumstance. There are also intentions to reduce bycatch of bigeye tuna in some gears and limits on overall fishing capacity. This meets SG80. However, the strategy is relatively imprecise and lacks a range of components including defining an appropriate mix of capacity by gear types, so it cannot be considered designed and therefore does not meet SG100.

Mediterranean Albacore

The current harvest strategy is not expected to achieve management objectives for this stock, so SG60 is not met. The strategy appears to be a laissez-faire approach, with no management cycle of feedback and control yet established. The current default reference point, MSY, is not estimated and not known. It is therefore not possible to assess whether the observed catches maintain the stock above or below this level. However, with the attempt at stock assessments in 2011 and accompanying advice, a strategy may be developed which would allow SG60 and SG80 to be met.

1.2.1.b Harvest strategy evaluation		
60 Guidepost	80 Guidepost	100 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.

Atlantic Bigeye

In the case of the bigeye stock, the present TAC is 85 000t, but recent catches were below the TAC level. The assessment showed that the bigeye stock is not overfished, and catches between 70-80 000t will result in the stock being likely (>70%) to be above the MSY level. For catches around 90 000t, this remains likely (>60%), although the risk of overfishing would increase. Recent catches have been estimated to have remained below 85 000t even taking into account IUU catch.

The approach to management appears somewhat ponderous and evidence that it will continue to work is limited, preventing a higher score. The system requires re-evaluation and resetting the TAC through Commission recommendations which must be accepted by the contracting parties on each occasion. There is no pre-agreement on how to react to stock changes (picked up by PI 1.2.2 below) 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 ($B>B_{MSY}$, $F<F_{MSY}$).

Atlantic Yellowfin

In the case of the yellowfin stock, the fishing mortality is constrained by controls primarily intended to limit fishing mortality on bigeye tuna. The assessment showed that the yellowfin stock is overfished or fully exploited, but model projections indicated that catches, at about the 2006 level, will recover the stock to above the MSY level.

The approach to management appears somewhat ponderous and evidence that it will continue to work is limited, preventing a higher score. The system requires re-evaluation and resetting the TAC through Commission recommendations which must be accepted by the contracting parties on each occasion. There is no pre-agreement on how to react to stock changes (picked up by PI 1.2.2 below) and stock assessments required to evaluate management performance are not frequent given the stock is heavily exploited. The next stock assessment for yellowfin is planned for 2015, which suggests the re-evaluation of management performance is around every 4 years.

Available evidence indicates that the harvest strategy should achieve its objectives, meeting SG80. However, the most recent evaluation of the stock status was unable to confirm the current expectations, and more broadly, the harvest strategy has only been considered in fairly narrow terms (total catch) and has not yet considered wider context of the fishery, so SG100 is not met.

Eastern Atlantic Skipjack

In the case of the Eastern skipjack stock, the most recent assessment showed that the skipjack stock is unlikely to be overfished. Monitoring of catches and fishing effort and size composition is in place. Evidence exists that the current constraints on fishing mortality (limits on effective fishing effort and other controls) are probably adequate to maintain the stock above B_{MSY}. This meets SG80.

The harvest strategy is not well-defined and has not been evaluated. The stock size is uncertain relative to target levels. These fisheries therefore cannot meet SG100.

Western Atlantic Skipjack

In the case of the western skipjack stock, the fishing mortality is constrained by fishery capacity and availability of bait. The assessment showed that the skipjack stock is very unlikely to be overfished, but the stock may continue to decline towards the MSY level. Monitoring of catches and fishing effort and size composition is in place. Evidence exists that the current constraints on fishing mortality are probably adequate to maintain the stock above B_{MSY}. This meets SG80.

The harvest strategy is not well-defined and has not been evaluated. The stock size is uncertain relative to target levels. These fisheries cannot meet SG100.

North Atlantic Albacore

The Scientific Committee considered that the current management regulations are sufficient for the recovery of the northern albacore stock based on model projections. The management advice from the 2009 stock assessment states that “The current assessment indicates TAC in the future should be less than 28000 t to promote stock rebuilding”, which subsequently led to the current TAC. In practice, actual catches have remained below the replacement yield for a number of years.

The 2013 assessment showed that the northern albacore stock is overfished, but model projections indicated that catches, at or below the TAC (28000t) will recover the stock. Because the observed catches after 2006 have been even lower than this, the biomass should be increasing. Overall, there is evidence that the strategy is achieving its current objective.

The approach to management appears somewhat ponderous and evidence that it will continue to work is limited. The system requires re-evaluation and resetting the TAC through Commission recommendations which must be accepted by the contracting parties on each occasion. There is no pre-agreement on how to react to stock changes (picked up by PI 1.2.2 below) and stock assessments required to evaluate management performance are not frequent given the stock is heavily exploited. In addition, the track record for this fishery is not good. In retrospect, the stock has been depleted and maintained below B_{MSY} since 1970. The new strategy appears to have improved on this, but that this can be sustained will need to be confirmed.

The available evidence indicates that the harvest strategy is achieving its objectives, meeting SG80. However, there need to be further evaluations of the stock status to confirm these expectations, and more broadly, the harvest strategy has only been considered in fairly narrow terms (total catch) and has not yet considered wider context of the fishery, so SG100 is not met.

South Atlantic Albacore

The assessment showed that the southern albacore stock is overfished or fully exploited. The present TAC is 24000t set in 2013, which is a significant reduction in the TAC set previously (29900t 2007-2011). Some recent catches have been a little above this level. The assessment suggested that the southern albacore stock is overfished, but model projections indicated that catches at or below 24000t are expected to recover the stock (>50% probability $B>B_{MSY}$).

The SCRS did not make any specific recommendations, but noted that catches at or below the current TAC should lead to recovery, but that this would be more rapidly achieved at lower catch levels. The Commission has shown a willingness to reduce the TAC in line with scientific advice. Furthermore, overall biomass appears to have increased in recent years, which has reversed a previous long term decline. Monitoring is in place and the available evidence indicates that the harvest strategy should achieve its objectives, meeting SG80.

The approach to management appears somewhat ponderous and evidence that it will continue to work is limited. The system requires re-evaluation and resetting the TAC through Commission recommendations which must be accepted by the contracting parties on each occasion. There is no pre-agreement on how to react to stock changes (picked up by PI 1.2.2 below) and stock assessments required to evaluate management performance are not frequent given the stock is heavily exploited. Because the harvest strategy has only been considered in fairly narrow terms (total catch), has not yet considered wider context of the fishery or maintained the stock at the target level, SG100 is not met.

Mediterranean Albacore

It is not possible to state that the current harvest strategy is likely to work, so the fishery does not meet SG60. There are no ICCAT regulations directly aimed at managing the Mediterranean albacore stock. No management recommendations were made by the Scientific Committee, apart from improving the data to the extent that a stock assessment can be carried out. Any limits on the fishing activities directed at this stock are based on social or economic controls, or other factors which do not appear to be under the control of ICCAT.

1.2.1.c Harvest strategy monitoring		
60 Guidepost	80 Guidepost	100 Guidepost
Monitoring is in place that is expected to determine whether the harvest strategy is working.		

Atlantic Bigeye

Monitoring is adequate to determine whether the harvest strategy is working. The different parts of the strategy include increasing the mean size and holding catches at around the current level or lower. Data are collected to estimate these quantities, although there is considerable uncertainty

associated with the accuracy of a large component of the catch monitoring. Also the stock assessment reports best estimates of biomass and biomass trend, which indicates whether management is achieving its objectives or not. Therefore, the fishery clearly meets SG60.

Atlantic Yellowfin

Monitoring is adequate to determine whether the harvest strategy is working. The different parts of the strategy include increasing the mean size and holding catches at around current level or lower. Data are collected to estimate these quantities. Also the stock assessment reports best estimates of biomass and biomass trend, which indicates whether management is achieving its objectives or not. Therefore, the fishery clearly meets SG60.

Eastern Atlantic Skipjack

Monitoring is adequate to determine whether the harvest strategy is working. Although the strategy is largely dependent on the bigeye and yellowfin harvest strategy, skipjack mean size and catch are monitored, which allows the effects of the harvest strategy on skipjack to be monitored. Data are collected to estimate these quantities. Also the stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not. Therefore, the fishery clearly meets SG60.

Western Atlantic Skipjack

Monitoring is adequate to determine whether the harvest strategy is working. Catch and effort are monitored to estimate total catch, CPUE and mean size. The stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not. Therefore, the fishery clearly meets SG60.

North Atlantic Albacore

Monitoring is adequate to determine whether the harvest strategy is working. The strategy consists of limiting catches at or below the MSY. Data are collected to estimate these quantities. Also the stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not. The fishery clearly meets SG60.

South Atlantic Albacore

Monitoring is adequate to determine whether the harvest strategy is working. The strategy consists of limiting catches to a level that is likely to lead to stock recovery to MSY. Data are collected to estimate these quantities. Also the stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not. The fishery clearly meets SG60.

Mediterranean Albacore

Some monitoring is in place, but limited to total catch and this is considered unreliable. Other data used for monitoring was considered incomplete. Limited tagging studies have been undertaken. It appears that there is no evidence whether the harvest strategy could achieve its objectives. The current strategy relies on limits on fishing capacity and targeting which do not appear to be controlled directly.

The stock assessment carried out in 2011 attempted to use the available information to evaluate the performance of the current harvest strategy. The tentative conclusion of this was that the current exploitation was probably less than MSY, and therefore the strategy, such as it is, is probably working. While the data have shortcomings (see PI 1.2.3), it is likely that with a longer time series the results will become more confident in showing whether overfishing is occurring. This is adequate to meet SG60.

1.2.1.d Harvest strategy review		
60 Guidepost	80 Guidepost	100 Guidepost
		The harvest strategy is periodically reviewed and improved as necessary.

Atlantic Bigeye

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 SG100.

Atlantic Yellowfin

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 SG100.

Eastern Atlantic Skipjack

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 SG100.

Western Atlantic Skipjack

There is no evidence of any formal review of the harvest strategy. The Performance Review could not evaluate whether the skipjack fisheries were achieving their objectives, and there is inadequate information available to indicate what improvements might be possible. Therefore, the fishery does not meet SG100.

North Atlantic Albacore

There is no evidence of any formal review of the harvest strategy. However, the Commission is currently actively developing a harvest control rule for this stock, so an external review at this time would be premature. Nevertheless, the fishery does not meet SG100.

South Atlantic Albacore

There is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is as yet inadequate information available to indicate what improvements might be possible. The fishery does not meet SG100.

Mediterranean Albacore

There is no evidence yet that management will respond appropriately to evaluations of the strategy, so SG100 has not been met.

Scoring for 1.2.1

Atlantic Bigeye: All SG60 and SG80, but no SG100, are met. 80

Atlantic Yellowfin: All SG60 and SG80, but no SG100, are met. 80

Eastern Atlantic Skipjack: All SG60 and 1 out of 2 SG80 are met. 70

Western Atlantic Skipjack: All SG60 and 1 out of 2 SG80 are met. 70

North Atlantic Albacore: All SG60 and SG80, but no SG100, are met. 80

South Atlantic Albacore: All SG60 and SG80, but no SG100, are met. 80

Mediterranean Albacore: Only 1 out of 3 SG60 are met. 50

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1.2.2 Harvest control rules and tools: There are well defined and effective harvest control rules (HCRs) in place.

1.2.2.a HCRs design and application		
60 Guidepost	80 Guidepost	100 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** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.

Atlantic Bigeye

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. The intention inferred from the scientific advice and management response is to maintain the stock at or above the MSY level by maintaining the catches at or below F_{MSY}. There is clear evidence of intention to reduce harvest in the face of depletion and the scientific advice has indicated that the current level of control was adequate for the recent recovery of the bigeye stock to above the MSY level. However, how this has been achieved is not well-defined; for example, the TAC has not been adjusted in response to changes in the stock status, although specific limits on the capacity of some fleets has been applied. Whether the TAC would be adjusted if the stock came under increased pressure is presumed, but not assured. This meets SG60, but not SG80.

Atlantic Yellowfin

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. The intention inferred from the scientific advice and management response is to maintain the stock at or above the MSY level by maintaining the catches at or below F_{MSY}. There is clear evidence of intention to reduce harvest in the face of depletion and the scientific advice has indicated that the current level of control was adequate for the recent recovery of the bigeye stock to above the MSY level. However, how this has been achieved is not well-defined; for example, the TAC has not been adjusted in response to changes in the stock status, although specific limits on the capacity of some fleets has been applied. Whether the TAC would be adjusted if the stock came under increased pressure is presumed, but not assured. This meets SG60, but not SG80.

It is also not clear how levels of yellowfin catch relate to the target catch for bigeye or what would be done if a higher fishing mortality could be directed at yellowfin.

Eastern Atlantic Skipjack

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. There is clear evidence of intention to reduce harvest in the face of depletion; the scientific advice indicated that the current level of control was adequate for a recovery of the stock to above the MSY level and that no additional action is required. However, this is not well-defined and it is not clear how levels of catch relate to the target catch for bigeye or what would be done if a higher fishing mortality could be directed at skipjack. Whether appropriate action would be taken if the stock came under increased pressure is presumed, but not assured.

Western Atlantic Skipjack

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. There is clear evidence of intention to reduce harvest in the face of depletion and the scientific advice indicated that the current level of control was adequate for a recovery of the stock to above the MSY level and that no additional action is required. Whether appropriate action would be taken if the stock came under increased pressure is presumed, but not assured.

Preliminary work has been undertaken on developing an appropriate harvest control rule. It will be important to check that the HCR are consistent with MSC criteria. Reference has been made to UN Fish Stocks Agreement as the basis for setting HCR, but as was noted, there has been some confusion over various meanings for terms and reference points used. It will be important to ensure the HCR is consistent with modern definitions of reference points, for example.

North Atlantic Albacore

There is currently no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. There is recent clear evidence of intention to reduce harvest in the face of depletion and the scientific advice indicated that the current level of control was adequate for a recovery of the stock to above the MSY level and that no additional action is required. However, this is not well-defined. Whether appropriate action would be taken if the stock came under increased pressure is presumed, but not assured. Seeing that the harvest control rules are generally understood rather than well defined, SG60 is met, but not SG80.

It should, however, be noted that the Commission has made significant progress in developing a harvest control rule. There is now a decision-framework (Rec. [11-13]) which meets MSC requirements. Commission requested SCRS to identify a limit reference point for northern albacore (Rec [11-04]), but no limit or threshold (trigger) points have been agreed. Management advice has been provided based on projections making use of Harvest Control Rule options consistent with the policies identified in Rec [11-13], and using an interim biomass limit of $0.4B_{MSY}$. SCRS has recommended that candidate HCRs should be further tested using computer simulations.

South Atlantic Albacore

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. There is clear evidence of intention to reduce harvest in the face of depletion and the TAC has been reduced in response to scientific advice to encourage recovery. However, this is not well-defined and in the case of southern albacore, catches may be required further below the catch limit to ensure recovery. Whether appropriate action would be taken in future if the stock came under increased pressure is presumed, but not assured. Seeing that the harvest control rules are generally understood rather than well defined, SG60 is met, but not SG80.

Although HCR development has been taking place for the northern albacore stock, similar progress does not appear to have been made yet for the southern albacore stock, and it may take longer for this scoring issue to meet SG80.

Mediterranean Albacore

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size is determined as below the maximum sustainable yield level. There is clear evidence of intention to reduce harvest in the face of depletion (implied from the management of other stocks), but information is currently inadequate to provide guidance on this (dealt with in PI 1.2.1 and 1.2.3). The harvest control rule is not well-defined. Whether appropriate action would be taken if it was detected that the stock was overfished might be assumed, but is not assured. Seeing that the harvest control rules are generally understood rather than well defined, SG60 is met, but not SG80.

1.2.2.b HCRs robustness to uncertainty		
60 Guidepost	80 Guidepost	100 Guidepost
	The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.

Atlantic Bigeye

No well-defined harvest control has been selected, making it difficult to evaluate uncertainties. The current TAC has been set for the period 2012-2015 at 85 000t, which is within the 80% confidence limits: 78 700-101 600t. Setting the TAC at this MSY level may be overoptimistic and arguably is not very precautionary.

Atlantic Yellowfin

It is not possible to evaluate the harvest control in relation to uncertainties, because it has not been defined well enough to do so.

Eastern Atlantic Skipjack

It is not possible to evaluate the harvest control in relation to uncertainties, because it has not been defined well enough to do so.

Western Atlantic Skipjack

It is not possible to evaluate the harvest control in relation to uncertainties, because the HCR has not been defined well enough to do so. Therefore SG80 cannot be met.

North Atlantic Albacore

It is not possible to evaluate the harvest control in relation to uncertainties, because the HCR has not been defined well enough to do so. The practice of carrying over quota which has not been caught continues, although it has been reduced from a maximum of 50% to 25%. This policy has caused problems in the past. The TAC has been set below the MSY level which is more precautionary than it has been in the past. An LRP has been adopted for this stock, but the overall HCR has not. Until it is well defined and tested, it will not be possible to determine how robust it is. Therefore, SG80 is not achieved.

South Atlantic Albacore

It is not possible to evaluate the harvest control in relation to uncertainties, because it has not been defined well enough to do so. The stock assessment does report probabilistic outcomes for various fixed catches and fishing mortalities. If the HCR is assumed to be maintaining the current TAC beyond 2016, the current HCR is not likely robust to the various uncertainties. Therefore, SG80 is not achieved.

Mediterranean Albacore

It is not possible to evaluate the harvest control in relation to uncertainties, because the HCR has not been defined well enough to do so. Indeed, the current status of the fishery is “data poor” and the subsequent increased risks to the fishery are not taken into account at all.

1.2.2.c HCRs evaluation		
60 Guidepost	80 Guidepost	100 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 HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.

Atlantic Bigeye

The current level of control, perhaps at least partly through controls placed on capacity, has resulted in sustainable catch levels for bigeye tuna. Individual countries apply quota controls on their own fleets and foreign fleets. Quota is decided upon at the Commission and clearly not all quotas are being met. As demonstrated by the implementation of a seasonal closed area, controls other than a TAC are available to control fishing mortality. If current catches continue, the stock should continue to increase.

There are various weaknesses preventing higher scores under this performance indicator. The TAC is shared among many countries and control is not precise. Recent catches appear to have been well below the TAC, so this control is not being tested. The practice of allowing the carry forward of uncaught allocations in all fisheries effectively decreases the control over fishing mortality. ICCAT has had significant problems in implementing appropriate management measures in Atlantic bluefin tuna, indicating a higher risk should apply to all species under its auspices.

Atlantic Yellowfin

The current level of control, mainly through limits on fishing capacity and a bigeye tuna catch limit, has resulted in sustainable catch levels for yellowfin tuna. In 1993, the Commission recommended "that there be no increase in the level of effective fishing effort exerted on Atlantic yellowfin tuna, over the level observed in 1992". As measured by fishing mortality estimates from the 2008 stock assessment, effective effort in 2006 appeared to be well below (about 25-30% below) the 1992 levels, and there has been a declining trend in recent years.

Individual countries apply quota controls on their own and foreign fleets, which limits effective fishing effort on yellowfin in the surface and longline fisheries. If current yellowfin catches continue the stock should increase in size and the fishery objectives should be met. Other tools are available in the form of closed areas and seasons. The tools appear to have been effective in controlling exploitation, meeting SG60. This evidence is limited, however, since it is not clear how much this is a result of the side effect of controls on bigeye tuna. If catches of bigeye rises to the current TAC level, it is not clear that yellowfin catches would still maintain the biomass at the target level. Therefore, SG80 is not met.

Eastern Atlantic Skipjack

The current level of control, mainly through limits on fishing capacity and a bigeye tuna catch limit, has resulted in sustainable catch levels for skipjack tuna. It is however apparent that there has so far perhaps been relatively little pressure to go after this stock compared to the more valuable tunas. Evidence is therefore limited to controls which could be placed on this species should this become necessary, and the proven ability of contracting parties to apply these limits.

The tools appear to have been effective in controlling exploitation, meeting SG60. This evidence is limited to observing the outcomes, so that not all available controls have been tested, and therefore SG80 is not met.

Western Atlantic Skipjack

The current level of control, mainly through limits on fishing capacity, has resulted in sustainable catch levels for skipjack tuna. This appears to apply to the Western stock, but the limits on fishing capacity are not clear. Therefore, the monitoring data suggest current levels of fishing effort are sustainable.

The tools appear to have been effective in controlling exploitation, meeting SG60. This evidence is limited to observing the results. Detailed information on capacity controls (for example, limits of bait availability for bait boats) was unavailable. Therefore, SG80 is not met.

North Atlantic Albacore

The current level of control has resulted in sustainable catch levels for northern albacore. If current catches continue the recovery could be very rapid. This amounts to some evidence that the harvest control rules are appropriate and effective, meeting SG60.

There are various weaknesses preventing higher scores under this performance indicator. The TAC is shared among many countries and control is not precise. The practice of allowing the carry-forward of uncaught allocations effectively decreases the control over fishing mortality. ICCAT has had significant problems in implementing appropriate management measures in Atlantic bluefin tuna, indicating a higher risk should apply to all species under its auspices. Therefore, SG80 is not met. SCRS has recommended testing candidate HCR using management strategy evaluations, which could provide adequate evidence to meet SG80 taking into account uncertainties such as those identified above.

South Atlantic Albacore

The current level of control has resulted in sustainable catch levels for southern albacore. If catches are limited to around 20000t, the recovery could be rapid. However, the assessment appears to have reduced the expected productivity of this stock and the TAC is set at a level which is not likely to ensure recovery. There is evidence that adjustment in response to scientific findings is likely, that the lower TAC will be effective in decreasing mortality, and that there has been an increase in biomass, which amounts to some evidence that the harvest control rules are appropriate and effective, meeting SG60.

There are various weaknesses preventing higher scores under this performance indicator. The TAC is shared among many countries and control is not precise. The practice of allowing the carry-forward of uncaught allocations effectively decreases the control over fishing mortality. ICCAT has had significant problems in implementing appropriate management measures in Atlantic bluefin tuna, indicating a higher risk should apply to all species under its auspices. Therefore, SG80 is not met.

Mediterranean Albacore

There appears to be no effective control over this fishery, at least by ICCAT. Therefore, SG60 is not met.

Scoring for 1.2.2

Atlantic Bigeye: All SG60, but no SG80, are met. 60

Atlantic Yellowfin: All SG60, but no SG80, are met. 60

Eastern Atlantic Skipjack: All SG60, but no SG80, are met. 60

Western Atlantic Skipjack: All SG60, but no SG80, are met. 60

North Atlantic Albacore: All SG60, but no SG80, are met. 60

South Atlantic Albacore: All SG60, but no SG80, are met. 60

Mediterranean Albacore: Only 1 out of 2 SG60 are met. 50

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1.2.3 Information / monitoring: Relevant information is collected to support the harvest strategy.

1.2.3.a Range of information		
60 Guidepost	80 Guidepost	100 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 are available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available.

Atlantic Bigeye

Although data have been generally poor and ICCAT has had considerable problems in maintaining accurate data in its database, the situation is not so bad for bigeye tuna that a good stock assessment could not be carried out. There is adequate information on stock structure, productivity and the fleets to allow a full stock assessment to be completed. For example, data were adequate to implement and evaluate a seasonal closure to reduce catches of small bigeye.

Furthermore, there is evidence that on-going research is planned to improve the information available; therefore the stock assessment indicating on-going development of data collection is adequate to detect and remove problems. The working group has recommended studies on fecundity and maturity and a tagging programme. Sources of errors in data collection are being investigated, leading to further directed research to reduce them. For example, there are on-going developments in the observer scientific data collection protocols for the different fleets, which provide accurate at-sea data.

Atlantic Yellowfin

Although data have been generally poor and ICCAT has had considerable problems in maintaining accurate data in its database, there have been significant improvements over time. For yellowfin tuna, the data were sufficient for a stock assessment with several approaches possible. Overall, there was adequate information on stock structure, productivity and the fishing fleets to allow a full stock assessment to be completed

There is evidence that on-going research is planned to improve information and therefore the stock assessment. This suggests that on-going development of data collection is adequate to detect and remove problems over time. The working group has recommended studies on fecundity and maturity and a tagging program, although these have not been directed at yellowfin. Various scientific studies using available data are regularly presented at ICCAT scientific meetings. Sources of errors in data collection are being investigated, leading to further directed research to reduce them. There is evidence that data are being corrected and updated.

While information is sufficient, meeting the SG80, it is not comprehensive. There is considerable environmental data not directly used in the current harvest strategy, but various data on age and abundance are limited and understanding of the population dynamics is incomplete compared to other stocks. These gaps are recognized and, although there have been improvements, the Working Group indicated a need to increase biological studies of yellowfin. With significant gaps, the fisheries cannot meet SG100.

Eastern Atlantic Skipjack

The 2008 external review panel was concerned that there appears to be little knowledge and information on skipjack tuna. Data have been generally poor and ICCAT has had considerable problems in maintaining accurate data in its database. In the case of skipjack, data limitations are significant enough to prevent quality stock assessments from being carried out. Data exist on fleets, catches, catch and fishing effort, size composition of the catch and stock structure (tagging). There is adequate information on the fleets, but information on stock structure and productivity seems to be a limiting factor for this stock. The working group appears to believe, among other things, that the Eastern stock comprises of a series of sub-stocks for which the structure is not well understood. Dividing the data into more homogenous consistent sets may improve assessments, but may also exacerbate problems with errors and data absence.

Western Atlantic Skipjack

The external review panel was concerned that there appears to be little knowledge and information on skipjack tuna. Data have been generally poor and ICCAT has had considerable problems in maintaining accurate data in its database. In the case of skipjack, data limitations are significant enough to prevent quality stock assessments from being carried out. There is adequate information on the fleets, but information on stock structure and productivity seems to be a limiting factor for this stock. However, the data were sufficient to attempt stock assessments based on catch and fishing effort data and size composition data.

The current hypothesis of two independent skipjack stocks (East and West) is probably adequate for current management purposes, but the stock fishery indicators, and probably future stock assessments, may be improved if based on smaller, more homogeneous areas.

There is evidence that on-going research is planned to improve information and therefore the stock assessment. This suggests that on-going development of data collection should be adequate to detect and remove problems in the long term.

Interest previously in this fishery by ICCAT appears to have been limited. Judging from Commission reports, by far the greatest interest and therefore resources appears to involve bluefin tuna, so skipjack, particularly the Western stock, is rather presumed to look after itself. The recent assessment in 2014 gives the impression that interest has increased in this stock with more effort being put into improving the data and assessment.

Although incomplete, information is sufficient to allow a stock assessment to be undertaken, meeting SG60. Information is not yet sufficient to apply the harvest strategy which is currently the same as other more heavily exploited stocks, and therefore the fisheries do not meet SG80.

North Atlantic Albacore

Although data have been generally poor and ICCAT has had considerable problems in maintaining accurate data in its database, there have been significant improvements over time. There was adequate information on stock structure, productivity and the fleets to allow a full stock assessment to be completed. Furthermore, there is evidence that on-going research is planned to improve information and therefore the stock assessment indicating on-going development of data collection is adequate to detect and remove problems.

The working group has recommended studies on ageing, fecundity and maturity and improvements in tagging research. Sources of errors in data collection are being investigated, leading to further directed research to reduce them. Ageing errors have been estimated and greater standardization on the approach to improve precision has been recommended. Further evidence of on-going improvement is the updating of albacore catch-at-size data and methods used to convert from size to age.

While information is sufficient, meeting the SG80, it is not comprehensive. There is considerable environmental data not directly used in the current harvest strategy, but various data on age and abundance are limited and understanding of the population dynamics is incomplete. These gaps are recognized and, although there have been improvements, the Working Group made a number of recommendations with respect to information which would improve the assessment. With significant gaps, the fisheries cannot meet SG100.

South Atlantic Albacore

Although data have been generally poor and ICCAT has had considerable problems in maintaining accurate data in its database, there have been significant improvements over time. There was adequate information on stock structure, productivity and the fleets to allow a full stock assessment to be completed. Furthermore, there is evidence that on-going research is planned to improve information and therefore the stock assessment indicating on-going development of data collection is adequate to detect and remove problems.

The working group has recommended various studies particularly on population structure and catchability. Sources of errors in data collection are being investigated, leading to further directed research to reduce them. Ageing errors have been estimated and greater standardization on the approach to improve precision has been recommended.

While information is sufficient, meeting SG80, it is not comprehensive. There is considerable environmental data not directly used in the current harvest strategy, but various data on age and abundance are limited and understanding of the population dynamics is incomplete. There may be some mixing with the Indian Ocean stock. These gaps are recognized and, although there have been improvements, the Working Group made a number of recommendations with respect to information which would improve the assessment. With significant gaps, the fisheries cannot meet SG100.

Mediterranean Albacore

Genetic studies suggest this stock is separated from the North Atlantic stock, and therefore needs to be managed separately. Mediterranean albacore data were reviewed in 2010 and as a result, deficiencies and a lack of information were identified in statistics from major fleets. It was concluded that in order to assess the status of this stock, the CPCs should provide revised and complete data for this purpose.

Considering the incomplete fishing statistics for Mediterranean albacore and the lack of knowledge on the lifecycle and the biological population parameter, the stock can be classified as data poor. There is no provision for data poor fisheries under ICCAT. Therefore the current default ICCAT harvest strategy is probably not appropriate (covered under PI 1.2.1). Some data exists (estimates of total catch, mortality, growth), but are incomplete. The fisheries do meet SG60, but with data insufficient to meet the default ICCAT harvest strategy, SG80 is not met.

1.2.3.b Monitoring		
60 Guidepost	80 Guidepost	100 Guidepost
Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.

Atlantic Bigeye

While far from perfect, monitoring indices are adequate for the harvest strategy. Indicators of stock abundance mainly consist of standardised catch-per-unit-effort indices. Given the large areas of ocean and dispersal of the species, dedicated surveys are not an option for this type of fishery. A single consistent index is not available for the entire time series, but the combined indices do appear to provide a consistent picture of the changes in abundance that have occurred. For the most recent stock assessment, two new indices of relative abundance and updated indices of those previously used were made available to the Committee, making in total six indices. The Japanese and Chinese Taipei's longline indices account for the longest time series and majority of the catch. The 2008 external review panel recommended, among other things, that efforts continue to be made to improve the timeliness and accuracy of fisheries data, and therefore this is likely to be an on-going process.

Atlantic Yellowfin

Monitoring indices are adequate for the current harvest control rule. Indicators of stock abundance mainly consist of standardized catch-per-unit-effort indices. Given the large areas of ocean and dispersal of the species, dedicated surveys are not an option for this type of fishery. Two abundance indices are available for the entire time series covering the majority range of the stock. The Japanese and Chinese Taipei's longline indices account for the longest time series and majority of the catch. The 2008 external review panel recommended, among other things, that efforts continue to be made to improve the timeliness and accuracy of fisheries data.

This accuracy and coverage of the monitoring program is adequate for the limited current harvest control rule (see PI 1.2.2), and available indicators would also support better defined rules based on fishing mortality and biomass estimates. Therefore, the fisheries meet SG80. The monitoring does not cover all information, and not all information from all fleets is recorded with a high degree of certainty. Uncertainties are known to occur from many sources, but their precise nature is also not known. For example, landings rejected by canneries and sold in local West African markets ("faux poisson") since 1980s consist of many species and sizes, and yellowfin tuna sold this way can only be estimated approximately. Therefore the fisheries do not meet SG100.

Eastern Atlantic Skipjack

Fishery removals are monitored at a level consistent with the harvest control rule. However, the abundance monitoring indices are very imprecise. The external review panel recommended, among other things, that efforts continue to be made to improve the timeliness and accuracy of fisheries data. Indicators of stock abundance mainly consist of a number of standardized catch-per-unit-effort indices. Given the large areas of ocean and dispersal of the species, dedicated surveys are not an option for this type of fishery. There were a number of abundance indices available from bait boats and purse seine catch and effort. However, the skipjack fishery has changed significantly since the early 1990s (progressive use of FADs and the increase of the fishing area towards the west and north), which has most likely increased catchability. In addition, effort directed at catching skipjack is not well recorded. This makes it difficult to use these data for reliable abundance indices.

This accuracy and coverage of the monitoring program is still adequate for a harvest control rule for this stock (see PI 1.2.2). However, this interpretation is conditional upon exploitation levels remaining relatively low because the low precision with which stock status is determined. Therefore, the fisheries meet SG80.

The monitoring does not cover all information, and not all information from all fleets is recorded with a high degree of certainty. For example, landings rejected by canneries and sold in local West African markets ("faux poisson") since 1980s consist of many species and sizes, and skipjack tuna sold this way can only be estimated approximately. Therefore the fisheries do not meet SG100.

Western Atlantic Skipjack

Fishery removals are monitored at a level consistent with the harvest control rule. However, the abundance monitoring indices are very imprecise. There are only three indicators of stock abundance, all of which are likely to be poor indices, as it is likely that their effort measurement may

not be entirely appropriate, there are likely to have been catchability changes within the time series, and indices may suffer from localized abundance effects which may not apply to the whole stock. Available indices show some conflicting trends. Given the large areas of ocean and dispersal of the species, scientific surveys are not an option for this type of fishery. However, it should be noted that larval surveys are used to monitor spawning stock size in key (Gulf of Mexico). Although abundance monitoring is undertaken with sufficient frequency, meeting SG60, they are not sufficiently accurate to support the target level of harvest required by ICCAT (i.e. maintaining the stock at or just above MSY), which does not meet SG80.

North Atlantic Albacore

Monitoring indices are adequate for the current harvest control rule. Indicators of stock abundance consist of standardized catch-per-unit-effort indices. Given the large areas of ocean and dispersal of the species, dedicated surveys are not an option for this type of fishery. A single consistent index was not available for the entire time series. The combined indices appear to provide a consistent picture of the changes in abundance that have occurred, although there are some significant differences among indices. Recommendations have included improved understanding of CPUE and population biology for this species.

This accuracy and coverage of the monitoring program is adequate for the limited current harvest control rule (see PI 1.2.2), and available indicators would also support better defined rules based on fishing mortality and biomass estimates. Therefore, the fisheries meet SG80. The monitoring does not cover all information, and not all information from all fleets is recorded with a high degree of certainty. Therefore the fisheries do not meet SG100.

South Atlantic Albacore

Monitoring indices are adequate for the current harvest control rule. Indicators of stock abundance mainly consist of standardized catch-per-unit-effort indices. Given the large areas of ocean and dispersal of the species, dedicated surveys are not an option for this type of fishery. A single consistent index is not available for the entire time series, but the combined indices do appear to provide a consistent picture of the changes in abundance that have occurred. Recommendations have included improved size composition coverage and CPUE standardization.

This accuracy and coverage of the monitoring program is adequate for the limited current harvest control rule (see PI 1.2.2), and available indicators would also support better defined rules based on fishing mortality and biomass estimates. Therefore, the fisheries meet SG80. The monitoring does not cover all information, and not all information from all fleets is recorded with a high degree of certainty. Therefore the fisheries do not meet SG100.

Mediterranean Albacore

Fishery removals are incomplete and there does not appear to be any acceptable indicator monitoring stock abundance. Complete catch and effort from the main longline fisheries are likely to be required to meet SG60. While catch and effort data exist, SCRS concluded that it was unreliable as an index of abundance, although a longer time series may help determine whether this is true. With only one stock assessment cycle having been completed, it is not possible to determine

monitoring is being undertaken with sufficient frequency yet. It might be argued that current data are adequate for RBF as long as total removals are recorded (i.e. these can be guaranteed to be low enough to be low risk). With total catches being unreliable, SG60 would be the best guidepost that any fishery could attain.

1.2.3.c Comprehensiveness of information		
60 Guidepost	80 Guidepost	100 Guidepost
	There is good information on all other fishery removals from the stock.	

Atlantic Bigeye

ICCAT has put considerable effort in getting countries to record and report catches. The current level of reporting is far from perfect given the number of small countries involved and difficulties in monitoring small vessels and activities in oceanic waters well away from the coast. This one of the on-going problems ICCAT faces with the contracting parties. Nevertheless, catches are recorded increasingly accurately with decreasing IUU fishing activity, and data are sufficiently well recorded for the stock assessment and for assessing the level of control sought by ICCAT over landed catches.

ICCAT operate a Statistical Document Program through recommendations 01-21 and 01-22, which establish very detailed programs for bigeye tuna and swordfish. Although not perfect, this sort of documentation scheme makes marketing IUU catch more difficult.

Atlantic Yellowfin

ICCAT has put considerable effort in getting countries to record and report catches. The current level of reporting is far from perfect given the number of small countries involved and difficulties in monitoring small vessels and activities in oceanic waters well away from the coast. This one of the on-going problems ICCAT faces with the contracting parties. Nevertheless, catches are recorded increasingly accurately with decreasing IUU fishing activity, and data are sufficiently well recorded for the stock assessment and for assessing the level of control sought by ICCAT over landed catches.

The catch data are sufficient for the harvest strategy, meeting SG80.

Eastern Atlantic Skipjack

ICCAT has put considerable effort in getting countries to record and report catches. The current level of reporting is far from perfect given the number of small countries involved and difficulties in monitoring small vessels and activities in oceanic waters well away from the coast. This illustrates the on-going problems ICCAT faces with the contracting parties. Nevertheless, catches are recorded increasingly well with decreasing IUU fishing activity, and data are sufficiently well recorded for the stock assessment and for assessing the level of control sought by ICCAT over landed catches. This meets SG80.

Western Atlantic Skipjack

ICCAT has put considerable effort in getting countries to record and report catches. Catches are recorded increasingly well with decreasing IUU fishing activity, and data are sufficiently well recorded for the stock assessment and for assessing the level of control sought by ICCAT over landed catches. Skipjack catches appear to be recorded accurately enough across all fisheries and are not the limiting factor on assessing this stock. Note that this is in contrast to the Mediterranean fisheries, where information provision to ICCAT appears currently inadequate.

Although incomplete, catch information is sufficient to allow a stock assessment to be undertaken, meeting SG80.

North Atlantic Albacore

ICCAT has put considerable effort in getting countries to record and report catches. The current level of reporting is far from perfect given the number of small countries involved and difficulties in monitoring small vessels and activities in pelagic waters well away from the coast. This illustrates the on-going problems ICCAT faces with the contracting parties. Nevertheless, catches are recorded increasingly well with decreasing IUU fishing activity, and data are sufficiently well recorded for the stock assessment and for assessing the level of control sought by ICCAT over landed catches. This meets SG80. Note that this is in contrast to the Mediterranean fisheries, where information provision to ICCAT appears currently inadequate.

South Atlantic Albacore

ICCAT has put considerable effort in getting countries to record and report catches. The current level of reporting is far from perfect given the number of small countries involved and difficulties in monitoring small vessels and activities in pelagic waters well away from the coast. This illustrates the on-going problems ICCAT faces with the contracting parties. Nevertheless, catches are recorded increasingly well with decreasing IUU fishing activity, and data are sufficiently well recorded for the stock assessment and for assessing the level of control sought by ICCAT over landed catches. This meets SG80.

Mediterranean Albacore

In general, the Mediterranean catches are highly uncertain. Estimated albacore catches, mainly by Italy and Greece, are still minor (less than 4,000 t) and do not show any significant trend over time. However, there is a lack of information concerning reported catches by many nations in recent years. The trend of fishing effort of the various gears fishing for albacore in the Mediterranean Sea is still not possible to estimate, due to short time series and inadequate coverage of artisanal gears. Information on size composition of the catch is also very limited.

Unreported catches are likely to make assessments using the RBF methodology difficult. In particular, unless the all fishery activities are recorded, it will not be possible to score availability,

encounterability or selectivity at anything else but high risk. In addition, lack of this basic information would make the RBF itself unreliable and therefore SG80 could not be met.

Scoring for 1.2.3

Atlantic Bigeye: All SG60 and SG80, but no SG100, are met. 80

Atlantic Yellowfin: All SG60 and SG80, but no SG100, are met. 80

Eastern Atlantic Skipjack: All SG60 and 2 out of 3 SG80 are met. 75

Western Atlantic Skipjack: All SG60 and 1 out of 3 SG80 are met. 65

North Atlantic Albacore: All SG60 and SG80, but no SG100, are met. 80

South Atlantic Albacore: All SG60 and SG80, but no SG100, are met. 80

Mediterranean Albacore: Only 1 out of 2 SG60 are met. 50

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1.2.4 Assessment of stock status: There is an adequate assessment of the stock status.

1.2.4.a Appropriateness of assessment to stock under consideration		
60 Guidepost	80 Guidepost	100 Guidepost
	The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.

Atlantic Bigeye

Various stock assessment models and software are applied. All methods and model structures are generic, but are structured to take advantage of the available data. Available software includes a variety of methods also used in other tuna fisheries and for other national stocks (including stock synthesis, VPA, production models, Multifan-CL and Bayesian biomass dynamics models). The main advice is obtained from relatively simple, but robust, production models. Although this ignores the limited size composition data, it also does not have to account for potential errors in this source of information. Therefore, the assessment is appropriate for the stock, harvest control rule and available data, but takes no special account of the major features of the stock or fishery.

Atlantic Yellowfin

Various stock assessment models and software were applied. All methods and model structures were generic, but were structured to take advantage of the available data. Available software includes a variety of methods also used in other tuna fisheries and for other national stocks (including stock synthesis, VPA, production models, Multifan-CL and Bayesian biomass dynamics models). The main advice is obtained from a relatively simple, but robust, virtual population analysis model and a production model, which makes use of the estimated catch-at-age.

The stock assessment has not been carried out frequently, considering the stock is rebuilding from below the MSY level. However, this frequency is still consistent with the current harvest control rule.

The assessment attempts to account for some features of the species biology and the fishery, but the approach remains broadly generic, meeting SG80, but not SG100. Uncertainty varies among different data sources, but these are treated in much the same way in the assessment. Also, improved information on the biology from, for example, tagging studies, could lead to an improved assessment meeting SG100.

Eastern Atlantic Skipjack

Various stock assessment models and software have been applied, but none fitted the data sufficiently well to provide precise management advice. All methods and model structures were generic, but are structured to take advantage of the available data. Available software includes a

variety of methods also used in other tuna fisheries and for other national stocks (catch-only production model, Bayesian biomass dynamics models and length based methods). Although there were problems with the assessments, these were probably due to problems with the data and treatment of data rather than the assessment methods themselves (see PI 1.2.3). As well as stock assessment modelling, more general assessment of indicators such as mean size and catch rates do not indicate that the stock is currently overexploited. The assessment has attempted to account for some features of the species biology and the fishery, but approaches remain broadly generic, and have not taken into account major features of the biology. However, the approaches being developed are appropriate to this species and should be able to support the type of harvest control rule being considered, meeting SG80. However, the stock structure and other major biological features which affect the assessment have not satisfactorily been addressed, so SG100 is not achieved.

Western Atlantic Skipjack

Various stock assessment models and software are applied. All methods and model structures are generic, but are structured to take advantage of the available data. Available software includes a variety of methods also used in other tuna fisheries and for other national stocks (catch only production model, Multifan-CL and Bayesian and non-Bayesian biomass dynamics models, length-based models). The main advice is obtained from a relatively simple production model, which only uses catch and effort data.

Although there were problems with the assessments, these may have been due to problems with the data rather than the assessment methods themselves. The final indices used for the assessment of the western stock were therefore, the Brazilian baitboat, the Venezuelan purse seine, the US longline and the Gulf of Mexico larval index. Western indices tend to show large inter-annual variability and a slight tendency of increase since 2000. It is unclear whether these are good indices of abundance for the entire stock being assessed.

The assessment attempts to account for some features of the species biology and the fishery, but the most reliable approaches remain broadly generic, meeting SG80, but not SG100. Uncertainty varies among different data sources, but these are treated in much the same way in the assessment. Also, improved information on the biology from, for example, through tagging studies, could lead to an improved assessment meeting SG100.

North Atlantic Albacore

Various stock assessment models and software have been applied. All methods and model structures are generic, but are structured to take advantage of the available data. Available software includes a variety of methods also used in other tuna fisheries and for other national stocks (including VPA, Stock Synthesis and Multifan-CL). Multifan-CL is used as the base case assessment for the North Atlantic albacore stock.

The stock assessment has not been carried out frequently considering it is rebuilding from below the MSY level. However, this frequency is still consistent with the current harvest control rule.

Life history model parameters are specific to the stock and/or species and have been derived from fitting stock assessment models or other independent research.

The assessment attempts to account for some features of the species biology and the fishery. The main assessment model is Multifan-CL which can account for a wide range of biological

characteristics of the stock. Although not all life history characteristics are well understood, the assessment does make use of what is known, meeting SG100.

South Atlantic Albacore

Various stock assessment models and software have been applied. All methods and model structures are generic, but are structured to take advantage of the available data. For the 2013 assessment, two forms of dynamic production models were used. One was fitted using maximum likelihood (ASPIC) and the other used Bayesian fitting methods (BSP).

The stock assessment has not been carried out frequently considering it is rebuilding from below the MSY level. However, this frequency is still consistent with the current harvest control rule.

Life history model parameters are specific to the stock and/or species and have been derived from fitting stock assessment models or other independent research. This information is used only to a very limited extent in production models (mainly in the priors for one of the parameters in BSP).

The assessment attempts to account for some features of the species biology and the fishery, but the approach remains broadly generic, meeting the SG80, but not SG100. Improved information on the biology from, for example, tagging studies, could lead to an improved assessment meeting SG100.

Mediterranean Albacore

Two stock assessments appropriate for data-poor fisheries were undertaken in 2011, and in addition a yield-per-recruit analysis was used to estimate appropriate fishing mortality-based reference points. These approaches are appropriate for this stock, meeting SG80. However, the methods are generic, and do not account for features such as recruitment, or other sources of uncertainty in the population dynamics which might be addressed through a full catch-at-age model. Specific attributes of the fishery, notably changes in selectivity, are accounted for. However, overall SG100 is not met.

1.2.4.b Assessment approach		
60 Guidepost	80 Guidepost	100 Guidepost
The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	

Atlantic Bigeye

The stock assessments have been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

Atlantic Yellowfin

The stock assessments have been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

Eastern Atlantic Skipjack

While previously, imprecise determinations of stock status have been adequate, increased levels of catch suggest risks are increasing, making this increasingly difficult to justify. The lack of a reliable fit of a stock assessment model suggests that the current determination of stock status is no longer appropriate. Catches since 2010 have exceeded 200000t, and the provision catch estimate for 2013 was around 220000t. This compares to the previous MSY estimate of 143 000-170 000t. While the SCRS considers the MSY is likely an underestimate and that the stock is above B_{MSY}, the stock appears to be exploited now to a level where risks of undetected overexploitation are no longer negligible.

The general approach to assessment is probably appropriate if the data are sufficient and are interpreted correctly. This is adequate to give a general determination of stock status relative to reference points, meeting SG60. However, MSY has not been estimated with any confidence, perhaps partly because the assessment is not appropriately aligned with stock structure. Therefore the stock assessment does not meet SG80.

Western Atlantic Skipjack

The stock assessment has been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

North Atlantic Albacore

The stock assessment has been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

South Atlantic Albacore

The dynamic surplus production stock assessments can be used to estimate the MSY reference point, and this is used to determine stock status. This meets SG80.

Mediterranean Albacore

Two stock assessments appropriate for data-poor fisheries were undertaken in 2011, and in addition a yield-per-recruit analysis was used to estimate appropriate fishing mortality-based reference points. These approaches attempt to estimate stock status relative to reference points, meeting SG60. The reference points relevant to the species are not well estimated, so stock status cannot be precisely determined, so SG80 is not met.

1.2.4.c Uncertainty in the assessment		
60 Guidepost	80 Guidepost	100 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.

Atlantic Bigeye

Stock assessment methods which have been used report uncertainty in estimates of stock status and other values of interest. Most also can report information in a probabilistic way. The main advice is obtained from biomass dynamics models which are fitted either in a Bayesian framework (BSP) or using a “bootstrap” re-sampling scheme (ASPIC). Results have been reported probabilistically for a range of scenarios and structural assumptions.

Atlantic Yellowfin

Although the assessments undertaken include fully stochastic (Bayesian) and sampling simulation or “bootstrap” methods, these results are reported along with other assessment approaches, also accounting for structural errors in this assessment. The working group was unable to choose between two structures for the catch-at-age model used for management advice, and therefore combined the estimates from both together with results from a production model. Point estimates are combined from stochastic simulations of the selected models to represent final probability density estimates for the values of interest. This takes account of uncertainty and treats the results in a probabilistic way, meeting SG100.

Eastern Atlantic Skipjack

The assessments undertaken include fully stochastic (Bayesian) methods, and results are reported along with other assessment approaches. It is recognition of the uncertainty that prevents precise management advice for this stock. However, although the models would allow stock status to be evaluated probabilistically, it is not clear that explicit consideration of risk is included in management decision making and no explicit reference is made to levels of risk in scientific advice

beyond a vague reference to the likely stock status. Therefore uncertainty is taken into account, meeting SG80, but the quantitative probabilities that could be generated are not reported and not used, so that SG100 is not met.

Western Atlantic Skipjack

Major sources of uncertainty were identified during the data review and discussions at the stock assessment meeting in 2014. These are clearly documented in the meeting report, achieving SG60.

Two types of modelling were used: biomass dynamics (surplus production) models and mean length (a dynamic variant of the Beverton-Holt length-based Z estimator). The assessments undertaken include fully stochastic (Bayesian) methods, and these results are reported. Although, there appeared to be significant issues with the stock assessments, a general estimate of stock status was determined by the working group. Uncertainty in the models and results was addressed and reported in management advice, so SG80 is not achieved.

Even if some of the models allow stock status to be evaluated probabilistically, it is not clear that explicit consideration of risk is included in management decision making and no explicit reference is made to levels of risk in scientific advice beyond a vague reference to the likely stock status. This would currently prevent SG100 being met.

North Atlantic Albacore

The main assessment is stochastic and advice is provided which is explicitly probabilistic. Decision tables are provided for various target fishing mortality and TAC levels, with probabilities that targets will be reached for projected years. Because there is clear evidence that consideration of risk is provided for management decision making, SG100 is met.

South Atlantic Albacore

The BSP model is Bayesian and reports results in a probabilistic way. The ASPIC model uses a different approach (bootstrap resampling), but essentially this captures the uncertainty and can effectively be interpreted in the same way. The models and various sensitivities have been combined to produce probabilities of achieving objectives based on various management decisions. This decision table approach is explicitly probabilistic. Therefore, SG100 is met.

Mediterranean Albacore

The main sources of uncertainty in the data have been identified and clearly reviewed and reported. All assessments took account of uncertainty in one way or another. The Bayesian Surplus Production (BSP) model even evaluated stock status probabilistically, meeting SG100. However this model was rejected and not used for scientific advice. The length-based methods dealt with uncertainty through accounting for observation error and qualitatively in discussion of scenarios, alternative selectivity and so on. The uncertainty was assessed, which led to a rejection of the assessment model. This meets SG60 and SG80, but not SG100.

1.2.4.d Evaluation of assessment		
60 Guidepost	80 Guidepost	100 Guidepost
		The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.

Atlantic Bigeye

Alternative software has been applied to the available data, although this falls short of a rigorous exploration of alternative hypotheses and approaches to assessment. The simplest model, the biomass dynamics model, is being used as the main source of management advice. Importantly, this ignores the available size composition data and projections based on this model will be poor if selectivity changes in the fishery. The other assessment methods are used to provide indications of uncertainty by providing a range of possible results. There are recommendations to continue work on developing improved statistical models. Overall, the stock assessment has partially met SG100, but has not met all the higher score requirements.

Atlantic Yellowfin

Alternative software has been applied to the available data, although this falls short of a rigorous exploration of alternative hypotheses and approaches to assessment. An age-structured population (VPA) and production model are being used as the main source of management advice. The VPA has been fitted with many different configurations in terms of data used and assumptions made in the model. The other assessment methods are used to provide indications of uncertainty by providing a range of possible results. There are recommendations to continue work on developing improved statistical models. Overall, the stock assessment has not been tested against many alternative hypotheses, so whether it is robust is not clear. This does not meet SG100.

Eastern Atlantic Skipjack

Alternative software has been applied to the available data, although this falls short of a rigorous exploration of alternative hypotheses and approaches to assessment. Most of these assessments were exploratory and only preliminary results were available. There are recommendations to continue work on developing improved statistical models. The assessment models that have been tried have not been robust. This does not meet SG100.

Western Atlantic Skipjack

Alternative software has been applied to the available data, although this falls short of a rigorous exploration of alternative hypotheses and approaches to assessment. However, the approaches were limited to two basic types, and results among these approaches were not consistent. There are recommendations to continue work on developing improved statistical models. Overall, the stock assessment has not been tested against many alternative hypotheses, and preliminary results available suggest the assessments may not be robust. This does not meet SG100.

North Atlantic Albacore

Alternative software has been applied to the available data, and this has resulted in a fundamental change to the method used. The methods that have been considered and developed now cover what might be reasonably expected for the available data. However, further evidence would be required on how what hypotheses have been considered and tested to meet SG100.

South Atlantic Albacore

Alternative software has been applied to the available data, although this falls short of a rigorous exploration of alternative hypotheses and approaches to assessment. The assessment in 2013 is based on simple production models which do not attempt to use size or age information. Alternative methods have been looked at for age-structure models, but the methods reviewed so far have not been exhaustive. There are recommendations to continue work on developing improved statistical models. Overall, the stock assessment has only partially met SG100.

Mediterranean Albacore

The assessments were tested to an extent, but not shown to be robust. One assessment was rejected and the other gave an incomplete picture of the stock and fishery. Opportunities to test alternative hypotheses and assessment approaches are limited with the available data. Nevertheless, alternative hypotheses will need to be developed and explored through additional assessment models, simulations and scenarios before SG100 could be met.

1.2.4.e Peer review of assessment		
60 Guidepost	80 Guidepost	100 Guidepost
	The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.

Atlantic Bigeye

The stock assessment is subject to review through a working group process. SCRS meet annually and review models, data and research on the main tuna species as well as other species within ICCAT jurisdiction. Although external review of the management system has taken place, there is no external technical review of the stock assessments yet. It is planned that the Working Group on Stock Assessment Methods will have invited experts and external reviewers.

Atlantic Yellowfin

The stock assessment is subject to review through a working group process. SCRS meet annually and review models, data and research on the main tuna species, as well as other species within ICCAT jurisdiction. Although external review of the management system has taken place, there is no external technical review of the stock assessments yet. It is planned that the Working Group on Stock Assessment Methods will have invited experts and external reviewers. SG80 is met, but without external review SG100 is not.

Eastern Atlantic Skipjack

The stock assessment is subject to review through a working group process. SCRS meet annually and review models, data and research on the main tuna species as well as other species within ICCAT jurisdiction. In addition, an external technical reviewer attended the last stock assessment workshop, so both SG80 and SG100, are met.

Western Atlantic Skipjack

The stock assessment is subject to review through a working group process. SCRS meet annually and review models, data and research on the main tuna species as well as other species within ICCAT jurisdiction. In addition, an external technical reviewer attended the last stock assessment workshop, so both SG80 and SG100, are met.

North Atlantic Albacore

The stock assessment is subject to review through a working group process. SCRS meet annually and review models, data and research on the main tuna species as well as other species within ICCAT jurisdiction. In addition, an external technical reviewer attended the last stock assessment workshop, so both SG80 and SG100, are met.

South Atlantic Albacore

The stock assessment is subject to review through a working group process. SCRS meet annually and review models, data and research on the main tuna species as well as other species within ICCAT jurisdiction. Although external review has taken place of the management system, there is no external technical review of the stock assessments, so SG80, but not SG100, is met.

Mediterranean Albacore

The stock assessment is subject to review through a working group process. SCRS meet annually and review models, data and research on the main tuna species as well as other species within ICCAT jurisdiction. Although external review has taken place of the management system, there is no external technical review of the stock assessments, so SG80, but not SG100, is achieved.

Scoring for 1.2.4

Atlantic Bigeye: All SG60 and SG80 are met, and 1 out of 4 SG100 are met. 85

Atlantic Yellowfin: All SG60 and SG80 are met, and 1 out of 4 SG100 are met. 85

Eastern Atlantic Skipjack: All SG60 and 3 out of 4 SG80 are met. 75

Western Atlantic Skipjack: All SG60 and SG80 are met, and 1 out of 4 SG100 are met. 85

North Atlantic Albacore: All SG60 and SG80 are met, and 3 out of 4 SG100 are met. 95

South Atlantic Albacore: All SG60 and SG80 are met, and 1 out of 4 SG100 are met. 85

Mediterranean Albacore: All SG60 and 3 out of 4 SG80 are met. 75

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IOTC Stocks

1.1 Outcome

1.1.1 Stock Status: The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.

1.1.1.a Stock status relative to recruitment impairment.		
60 Guidepost	80 Guidepost	100 Guidepost
It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.

Indian Ocean Bigeye

The assessment advice given by the Working Party in 2013 suggested that the stock was not overfished (B_{2012}/B_{MSY} = 1.44, with estimates ranging from 0.87 to 2.22) and overfishing was not occurring (F_{2012}/F_{MSY}=0.42 with estimates ranging from 0.21 to 0.80). Spawning stock biomass in 2012 was estimated to be 40% (27–54%) of the unfished levels. These were based upon Stock Synthesis v3 (SS3) results using data to 2012. Alternative model (ASPM and ASAP) were also run but results were similar to the SS3, but were not as flexible as SS3. The range of SS3 runs was thought to capture the uncertainty in the assessment. Average catch 2008-2012 (108 000t) was lower than the median MSY value (132000t; 98500 -207000). However, catches have been increasing and the 2012 catch (1115 793t) was within the range of MSY estimates. With the stock biomass still relatively high, these increasing catches could have still resulted in a low fishing mortality.

These results imply that the stock is above the point where recruitment would be impaired with a high degree of certainty. The default value for PRI is around 50% of the B_{MSY} level. The lower bound of the estimate range for B_{2012}/B_{MSY} is higher than 0.5 and B_{2012}/B_{MSY} higher than 20%, indicating there is a high degree of certainty that the stock is above the point where recruitment would be impaired. Thus, this meets SG100.

Indian Ocean Yellowfin

The stock assessment in 2012 (MultifanCL) suggested that the stock was not overfished (B_{2010}/B_{MSY}=1.24, with estimates ranging from 0.91 to 1.40) and overfishing was not occurring

(F_{2010}/F_{MSY}=0.69, with estimates ranging from 0.59 to 0.90). Spawning stock biomass in 2010 was estimated to be 38% (28–38%) of the unfished levels. However, estimates of total and spawning stock biomass show a marked decrease over the last decade, accelerated by the high catches of 2003–2006. Reductions in effort and, hence, catches have halted the decline. This implies that the stock was highly likely to be above the point where recruitment would be impaired – the default value for this being around 50% of the B_{MSY} level. In addition, the Kobe strategy matrix provides a projection of stock status to 2013. Based on a constant catch of 386400t, the probability that the stock would fall below B_{MSY} by 2013 was estimated to be low (<1%).

The probability of B_{2013} being below B_{MSY} is very low, and considering that PRI is also below B_{MSY}, there is a high degree of certainty that the stock is above the point where recruitment would be impaired. This meets SG100.

Indian Ocean Skipjack

The last stock assessment in 2014 suggested that the stock was not overfished ($B_{2013}>B_{MSY}$) and that overfishing is not occurring (Average Catch 2009-2013 < MSY). Spawning stock biomass was estimated to have declined to 58%B_0 in 2013 (80% confidence interval range 53%–62%).The stock remained well above the estimated biomass at MSY (B_{2013}/B_{MSY}=1.59 with 80% confidence interval 1.13 to 2.14). However, estimates of total and spawning stock biomass show a decrease over the last decade, accelerated by the high catches of 2003–2006. Recent reductions in effort and, hence, catches may have reduced the decline. This implies that the stock is highly likely to be above the point where recruitment would be impaired – the default value for this being around 50% of the B_{MSY} level. This meets SG80. Additionally, the point estimate of B_{2013}/B_{MSY} and B_{2013}/B_0 are relatively high indicating there is a high degree of certainty that the stock is above the point where recruitment would be impaired. Applying an appropriate adjustment to the 80%CI, considering just the lower tail, and assuming the estimate is approximately normal, there is a 95% probability B_{2013}/B_0 > 51%, which is much greater than the precautionary default 40% B_{MSY}/B_0. Thus, this meets SG100.

Indian Ocean Albacore

The IOTC's Working Party on Temperate Tunas in 2014 reported on albacore assessments that were done using a variety of models, but used the Stock Synthesis v3 (SS3) and ASPIC for the final advice. The SS3 analyses suggested that biomass has declined to about 21% of the unexploited level. The assessment results suggest biomass is around the MSY level (B_{2012}/B_{MSY} = 1.09; 80% CI 0.34-2.20) and is thus classified as not overfished, with the implication that there is a substantial probability (perhaps 50%) that biomass is less than the MSY level. In addition, there is a 10% probability that spawning stock biomass is less than 34% B_{MSY}. It is considered most likely that the most recent fishing mortality rate has been below the MSY level, but there remains considerable risk that this is not the case (F_{2012}/F_{MSY} > 1). Therefore, it is likely, but not highly likely that the stock is above the point where recruitment is impaired.

The current assessment suggests that B_{MSY} is around 20% of the unexploited state (presumed to be B_{1950}). Without a stock recruitment relationship, the default PRI is determined as 75% of the B_{MSY} level (B_{MSY}<27%B_0, in which case the default PRI should be 75%B_{MSY}; CR2.0 SA2.2.3) which is around 15% unexploited level. It is not clear from the results what the probability is that spawning stock is above this level. A crude estimate based on the maximum likelihood estimate and the 80% confidence interval (assuming that the square-root transformed estimate value is approximately normally distributed) suggested that the point where the stock is likely (>30% probability; CR2.0 SA

2.2.1.1) above is around 74% making the determination borderline, but there is insufficient evidence that it meets SG60. If evidence becomes available to support the MSY reference point showing that it was consistent with MSC standard, the fishery could meet SG60, but such evidence is required. Work on management strategy evaluations may be able to demonstrate this.

Even based upon the interim limit reference point proposed by IOTC (Resolution 13/10; B_{lim}=40%B_{MSY} ~ 8%B_0), the available evidence indicates considerable risk to the stock status at current catch levels. The Kobe strategy matrix suggests that there is a 28% probability that the spawning stock will be less than the limit in 2022 for the SS3 model (no limit reference point is defined for the ASPIC model). This at best would meet SG60, not SG80.

1.1.1.b Stock status in relation to achievement of Maximum Sustainable Yield (MSY).		
60 Guidepost	80 Guidepost	100 Guidepost
	The stock is at or fluctuating around a level consistent with MSY.	There is a **high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.

Indian Ocean Bigeye

Based on the 2013 assessment, it is likely that the stock biomass is above that which would produce MSY, while the fishing mortality rate is below F_{MSY}. This latest assessment suggests that fishing mortality rates have likely decreased and have been below F_{MSY} in recent years. Even for those plausible model runs (2 out of 12) indicating the stock is below the MSY level, the stock remained close to the B_{MSY}, and fishing mortality is low enough to suggest the stock is stable or increasing. This meets SG100, as these results indicate that there is “high degree of certainty” that biomass has been above or around the MSY level since 2008.

Indian Ocean Yellowfin

Based on the 2012 assessment, it is likely that the stock biomass is above that which would produce MSY, while the fishing mortality rate is approaching F_{MSY}. The poor marine security situation in the western ocean is thought to have led to lower purse seine and longline effort, so that fishing mortalities have been below the MSY level. The Kobe strategy matrix indicates that there was a “high degree of certainty” that stock was above the MSY level in 2013.

However, there are two concerns which suggest a lower score is more appropriate. No new stock assessment was conducted in 2014 and catches have risen in the last few years to levels beyond the precautionary advice. Actual catches exceeded the constant catch used in the projections in the last two years (2010-2013: 299713t 327453t 400292t 402084t), which was used as the basis for determining stock status in 2013. This suggests a higher probability of the stock being at or below B_{MSY} than suggested in the Kobe strategy matrix projection probability estimates preventing the SG100 being met without more evidence.

Indian Ocean Skipjack

Based on the 2014 assessment, there is a low risk of exceeding MSY-based reference points by 2023 if catches are maintained at the 2013 catch level of 425 000t or below (less than 1% risk that $B_{2023} < B_{MSY}$ or $F_{2023} > F_{MSY}$).

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.

Indian Ocean Albacore

For both the ASPIC (production model) and SS3 (age structured) assessment results indicate $B_{2012}/B_{MSY} \approx 1$ and is thus classified by this as not overfished, but the implication is that there is a substantial probability (close to 50%) that $B_{2012}<B_{MSY}$. Therefore an argument can be made that the stock is at or fluctuating around its target reference point, despite the uncertainty being large. This could fulfil SG80, although any negative trends in biomass without an effective controls to reduce harvest would undermine this.

Note that this is in stark contrast to scoring issue a above, because the B_{MSY} level appears to have been set relatively low, which, without strong justification, is not sufficiently precautionary for the MSC standard.

Scoring for 1.1.1

Indian Ocean Bigeye: All SG60, SG80 and SG100 are met. 100

Indian Ocean Yellowfin: All SG60 and SG80 are met, and 1 out of 2 SG100 are met. 90

Indian Ocean Skipjack: All SG60, SG80 and SG100 are met. 100

Indian Ocean Albacore: The SG60 is not met. 50

References

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

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1.1.2 Stock Rebuilding: Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe.

Scoring for 1.1.2

References

1.2 Harvest Strategy (Management)

1.2.1 Harvest Strategy: There is a robust and precautionary harvest strategy in place.

1.2.1.a Harvest strategy design		
60 Guidepost	80 Guidepost	100 Guidepost
The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.

Indian Ocean Bigeye

IOTC's objectives include the adoption, on the basis of scientific evidence, conservation and management measures to ensure the conservation of the stocks and to promote the objective of their optimum utilisation throughout the Indian Ocean. Therefore, the harvest strategy objective is to maintain stock levels at or above the biomass which would produce MSY.

Scientific advice has been formulated relative to a harvest strategy relative to MSY reference points and is responsive to that state of the stock and to limit and target reference points commonly used for bigeye and other tropical tunas, meeting SG80. However, it is unclear whether the harvest strategy is in any way designed to achieve objectives in the management actions that are taken, preventing meeting SG100.

Indian Ocean Yellowfin

IOTC's objectives include the adoption, on the basis of scientific evidence, conservation and management measures to ensure the conservation of the stocks and to promote the objective of their optimum utilisation throughout the Indian Ocean. Therefore, the harvest strategy objective is to maintain stock levels at or above the biomass which would produce MSY.

Scientific advice has been formulated relative to a harvest strategy relative to MSY reference points and is responsive to that state of the stock and to limit and target reference points commonly used for yellowfin and other tropical tunas, meeting SG80. This included two closed areas (UK IOT and Resolution 12/13 closed area 0°-10° N. and 40°-60° E. in November to purse seine - removed under Resolution 14/02). Much of the strategy is untested and it is unclear whether the harvest strategy

will be fully effective. However, the harvest strategy should still achieve objectives if implemented, meeting SG60.

More specifically, there was no stock assessment in 2014 (reported short term projections run to 2013) and catches have risen in the last two years above the scientific advice, so that it is likely $F_{2013}>F_{MSY}$. While it is likely the stock is still above the MSY, it is not yet clear that the management system will be able to respond in a timely manner and perhaps currently depends on externalities (e.g. marine security situation reducing fishing effort), which are likely to change. Given the lack of an immediate response to recent high catches (see Resolution 14/02), more evidence is required that the harvest strategy is responsive. This does not meet SG80.

The designed aspect of the strategy to change overall selectivity cannot be given full credit and SG100 is not met.

Indian Ocean Skipjack

IOTC's objectives include the adoption, on the basis of scientific evidence, conservation and management measures to ensure the conservation of the stocks and to promote the objective of their optimum utilisation throughout the Indian Ocean. Therefore, the harvest strategy objective is to maintain stock levels at or above the biomass which would produce MSY.

Scientific advice has been formulated relative to a harvest strategy relative to MSY reference points and is responsive to that state of the stock and to limit and target reference points commonly used for skipjack and other tropical tunas, meeting SG80. However, it is unclear whether the harvest strategy would be fully responsive. Therefore, the designed aspect of the strategy to change overall selectivity cannot be given full credit and SG100 is not met.

Indian Ocean Albacore

IOTC's objectives include the adoption, on the basis of scientific evidence, conservation and management measures to ensure the conservation of the stocks and to promote the objective of their optimum utilisation throughout the Indian Ocean. Therefore, the harvest strategy objective is to maintain stock levels at or above the biomass which would produce MSY.

Scientific advice has been formulated relative to a harvest strategy using MSY reference points. This part of the harvest strategy responsive to that state of the stock and to limit and target reference points used for albacore. However, links among the strategy components appear to be weak and it is unclear whether the harvest strategy has been fully responsive or that the management components are working together with the scientific advice. Although reductions in fishing effort have been recommended by scientific committee for a number of years, no such reduction has yet been implemented (e.g. capacity reduction initiatives are not effective), suggesting that the system is slow to respond for this stock. Catches have been reduced in the 2011 and 2012, but remain above the likely MSY and it is not clear this reduction is due to any particular management action. The SG60 is only met on the basis that some reduction is achieved in the short term, otherwise the harvest strategy will lose credibility. Continued increases in exploitation level, which would be inconsistent with stated management aims, would lead to failure to meet SG60. Therefore, there is significant doubt that the harvest strategy will be fully effective, so SG60, but not SG80, is met.

1.2.1.b Harvest strategy evaluation		
60 Guidepost	80 Guidepost	100 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.

Indian Ocean Bigeye

In the case of the bigeye, the fishing mortality is below the MSY level. The assessment showed that the stock is not overfished, indicating that overall levels of exploitation are sustained, but this may depend on the current situation. Testing is provided by short term projections of the expected mortality. This meets SG80. There is insufficient evidence that the harvest strategy will work fully, preventing a higher score. There is no pre-agreement on how to react to stock changes (picked up by PI 1.2.2 below). The Scientific Committee suggested that the recent drop in catches may be due in part to increased piracy in the Northwest India Ocean, which is not the result of management action. In addition, the seasonal closed area off Somalia has been removed, reducing control somewhat. It is unclear what will happen if the marine security situation improves. So, it has yet to be shown that the management system can maintain stock at the target level ($B>B_{MSY}$, $F<F_{MSY}$) if circumstances change, so SG100 is not met.

Indian Ocean Yellowfin

In the case of the yellowfin, the catches have been most likely below MSY. Testing is provided by short term projections of the expected mortality. The assessment indicates that the yellowfin stock is not overfished, it can be argued that current controls on fishing are in place and have been effective in limiting exploitation levels in the current circumstances, meeting SG80. There is yet to be evidence given that the harvest strategy will work in all circumstances as they change, preventing a higher score. There is no pre-agreement yet on how to react to stock changes (picked up by PI 1.2.2 below). It has yet to be shown that the management system can maintain stock at the target level ($B>B_{MSY}$, $F<F_{MSY}$), so SG100 is not met.

Indian Ocean Skipjack

The present catch is below MSY. Testing is provided by short term projections of the expected mortality. The assessment has shown that the skipjack stock is not overfished, indicating that so far the harvest strategy has been effective in controlling exploitation on this stock, meeting SG80. There is some evidence that the harvest strategy will work as long as current situation remains the same where access to some areas is prevented by piracy, for example. However, until more planned components of the system are in place and these are tested at least through simulation based on a

realistic assessment on the control that can be applied in the international fishery, the fishery cannot be considered fully evaluated, so SG100 is not met.

Indian Ocean Albacore

It is considered likely that recent fishing mortality greater than F_{MSY} ($F_{2012}/F_{MSY} > 1$) and biomass around, but more likely above, the MSY level ($B_{2012}/B_{MSY} \approx 1$). The stock is thus classified as not overfished, but the implication is that there is a substantial probability (perhaps 50%) that $B<B_{MSY}$. Testing is provided by short term projections of the expected mortality. Based on the ASPIC model or SS3 models respectively, there is a 73% or 39% probability that the stock will be below the MSY level if catches remain at the average 2011-13 level. Given that the biomass MSY reference point is relatively low, it is not clear that the stock is at a safe level considering the risks to recruitment.

There is no pre-agreement on how to react to stock changes (picked up by PI 1.2.2 below). It has yet to be shown that the management system can maintain stock at the target level ($B>B_{MSY}$, $F<F_{MSY}$). Although in general terms the current strategy will likely work, meeting SG60, evidence that it will work is still lacking in this particular case, so SG80 cannot be met.

1.2.1.c Harvest strategy monitoring		
60 Guidepost	80 Guidepost	100 Guidepost
Monitoring is in place that is expected to determine whether the harvest strategy is working.		

Indian Ocean Bigeye

Monitoring is adequate to determine whether the harvest strategy is working. The different parts of the strategy include increasing the mean size and holding catches at around current level or lower. Data are collected to estimate these quantities. Also the stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not. Therefore, the fishery clearly meets SG60.

Indian Ocean Yellowfin

Monitoring is adequate to determine whether the harvest strategy is working. The different parts of the strategy include increasing the mean size and holding catches at around current level or lower. Data are collected to estimate these quantities. Also the stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not. Therefore, the fishery clearly meets SG60.

Indian Ocean Skipjack

Monitoring is adequate to determine whether the harvest strategy is working. The different parts of the strategy include increasing the mean size and holding catches at around current level or lower. Data are collected to estimate these quantities. Also the stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not. Therefore, the fishery clearly meets SG60.

Indian Ocean Albacore

Monitoring is adequate to determine whether the harvest strategy is working. The different parts of the strategy include increasing the mean size and holding catches at around current level or lower. Data are collected to estimate these quantities. Also the stock assessment reports estimates of biomass, which indicates whether management is achieving its objectives or not. Therefore, the fishery clearly meets SG60.

1.2.1.d Harvest strategy review		
60 Guidepost	80 Guidepost	100 Guidepost
		The harvest strategy is periodically reviewed and improved as necessary.

Indian Ocean Bigeye

There is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is as yet inadequate information available to indicate what improvements might be possible. The fishery does not meet SG100.

Indian Ocean Yellowfin

There is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is as yet inadequate information available to indicate what improvements might be possible. Specifically, the Scientific Committee suggested that the recent drop in catches may be due in part to increased piracy in the Northwest India Ocean. This is not part of the harvest strategy and has reduced pressure on the stock, but also suggests that the stock has yet to be tested. The fishery does not meet SG100.

Indian Ocean Skipjack

There is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is as yet inadequate information available to indicate what improvements might be possible. The fishery does not meet SG100.

Indian Ocean Albacore

There is no evidence of any formal review of the harvest strategy. Although the harvest strategy is reasonable, there is as yet inadequate information available to indicate what improvements might be possible. The fishery does not meet SG100.

Scoring for 1.2.1

Indian Ocean Bigeye: All SG60 and SG80, but no SG100, are met. 80

Indian Ocean Yellowfin: All SG60 and 1 out of 2 SG80 are met. 70

Indian Ocean Skipjack: All SG60 and SG80, but no SG100, are met. 80

Indian Ocean Albacore: All SG60, but no SG80, are met. 60

References

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

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1.2.2 Harvest control rules and tools: There are well defined and effective harvest control rules (HCRs) in place.

1.2.2.a HCRs design and application		
60 Guidepost	80 Guidepost	100 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** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.

Indian Ocean Bigeye

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. There is evidence of intention to reduce harvest should depletion occur and the scientific advice is prepared to make recommendations to that effect if it were to occur, meeting SG60. Controls, including indirect effects, limit fishing effort and catches through various conservation measures (see the Compendium of Active CMM for 2014).

However, there is an interim decision framework with reference points (Resolution 13/10) for all tunas and swordfish. This includes the intention to develop harvest control rules (HCRs) using simulations and guidelines in the UNFSA and the IOTC Agreement. The stated objectives are based on the Kobe plot, are in place, well-defined and are consistent with SG80. However, exactly what action would be taken in particular cases has yet to be determined, and therefore although the intention of the HCR is clear, it is not well-defined and does not fully meet SG80, although there is evidence for the on-going development of an HCR.

Indian Ocean Yellowfin

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. There is evidence of intention to reduce harvest should depletion occur and the scientific advice is prepared to make recommendations to that effect if it were to occur, meeting SG60. Controls, including indirect effects, limit fishing effort and catches through various conservation measures (see the Compendium of Active CMM for 2014).

However, there is an interim decision framework with reference points (Resolution 13/10) for all tunas and swordfish. This includes the intention to develop harvest control rules (HCRs) using simulations and guidelines in the UNFSA and the IOTC Agreement. The stated objectives are based on the Kobe plot, are in place, well-defined and are consistent with SG80. However, exactly what action would be taken in particular cases has yet to be determined, and therefore although the intention of the HCR is clear, it is not well-defined and does not fully meet SG80, although there is evidence for the on-going development of an HCR.

Indian Ocean Skipjack

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. There is evidence of intention to reduce harvest should depletion occur and the scientific advice is prepared to make recommendations to that effect if it were to occur, meeting SG60. Controls, including indirect effects, limit fishing effort and catches through various conservation measures (see the Compendium of Active CMM for 2014).

However, there is an interim decision framework with reference points (Resolution 13/10) for all tunas and swordfish. This includes the intention to develop harvest control rules (HCRs) using simulations and guidelines in the UNFSA and the IOTC Agreement. The stated objectives are based on the Kobe plot, are in place, well-defined and are consistent with SG80. However, exactly what action would be taken in particular cases has yet to be determined, and therefore although the intention of the HCR is clear, it is not well-defined and does not fully meet SG80, although there is evidence for the on-going development of an HCR.

Indian Ocean Albacore

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However, there is an interim decision framework with reference points (Resolution 13/10) for all tunas and swordfish. This includes the intention to develop harvest control rules (HCRs) using simulations and guidelines in the UNFSA and the IOTC Agreement. The stated objectives are based on the Kobe plot, are in place, well-defined and are consistent with SG80. However, exactly what action would be taken in particular cases has yet to be determined, and therefore although the intention of the HCR is clear, it is not well-defined and does not fully meet SG80, although there is evidence for the on-going development of an HCR.

1.2.2.b HCRs robustness to uncertainty		
60 Guidepost	80 Guidepost	100 Guidepost
	The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.

Indian Ocean Bigeye

It is not possible to evaluate the harvest control in relation to uncertainties, because the HCR has not been defined well enough to do so. Therefore SG80 cannot be met. The interim decision framework clearly intends that reference points and HCR under development (Resolution 13/10) will be robust and this is identified as one of the criteria for evaluation.

Indian Ocean Yellowfin

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Indian Ocean Albacore

It is not possible to evaluate the harvest control in relation to uncertainties, because the HCR has not been defined well enough to do so. Therefore SG80 cannot be met. The interim decision framework clearly intends that reference points and HCR under development (Resolution 13/10) will be robust and this is identified as one of the criteria for evaluation.

1.2.2.c HCRs evaluation		
60 Guidepost	80 Guidepost	100 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 HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.

Indian Ocean Bigeye

A level of control to respond to excess fishing pressure has not been demonstrated partially because biomass has remained above that which would produce MSY. 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, although Resolution 14/02 has replaced Resolution 12/13 for tropical tunas, removing previous management controls despite there being evidence that intervention may be required. There is some evidence that some IOTC members have controlled their own catches in an effective manner and that this could be extended across key fleets (e.g. larger purse seine and longline vessels), meeting SG60. Nevertheless, there are as yet no harvest control rules at the IOTC level and, thus, limited evidence that the available tools would be effective, preventing SG80 being met.

Indian Ocean Yellowfin

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In the case of yellowfin, the stock is declining and based on projections is likely to fall below its target point within the next few years, although no stock assessment was completed in 2014. This is likely due to changing the context of the fishery, where effort is increasingly not being limited by the marine security situation. The onus on the management system is to ensure catches are reduced in line with the scientific recommendation. Failure to do so will make it increasingly difficult to argue tools are available to reduce exploitation for any IOTC tropical stock, leading to a failure to meet SG60 until clearer evidence comes available, likely requiring that tools are in place and are effective.

Indian Ocean Skipjack

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their own catches in an effective manner and that this could be extended across key fleets (e.g. larger purse seine and longline vessels), meeting SG60. Nevertheless, there are as yet no harvest control rules at the IOTC level and, thus, limited evidence that the available tools would be effective, preventing SG80 being met.

Indian Ocean Albacore

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In the case of albacore, there has as yet been no reduction in fishing effort despite the scientific advice indicating that such a reduction is necessary for precautionary management under the current harvest strategy. Therefore, although tools are available to implement a HCR, they have yet to demonstrate they can reduce fishing mortality. Furthermore, if there is no appropriate response soon, it will become increasingly difficult to argue that tools are, in reality, available to reduce the exploitation level and the SG60 will not be met. Furthermore, failure of one stock to apply such controls could lead to failures in others as a lack of response undermines confidence that such tools are “available”.

Scoring for 1.2.2

Indian Ocean Bigeye: All SG60, but no SG80, are met. 60

Indian Ocean Yellowfin: All SG60, but no SG80, are met. 60

Indian Ocean Skipjack: All SG60, but no SG80, are met. 60

Indian Ocean Albacore: All SG60, but no SG80, are met. 60

References

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

IOTC 2014. Report of the Fifth Session of the IOTC Working Party on Temperate Tunas. Busan, Rep. of Korea, 28–31 July 2014. IOTC–2014–WPTmT05–R[E].

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IOTC2013. Executive Summary Status of the Indian Ocean skipjack tuna (SKJ: Katsuwonus pelamis) resource. IOTC-2013-SC16-R[E]

IOTC2013. Executive Summary Status of the Indian Ocean yellowfin tuna (YFT: Thunnus albacares) resource. IOTC-2013-SC16-R[E]

IOTC2013. Report of the Fifteenth Session of the IOTC Working Party on Tropical Tunas. San Sebastian, Spain, 23–28 October 2013. IOTC–2013–WPTT15–R[E]

1.2.3 Information / monitoring: Relevant information is collected to support the harvest strategy.

1.2.3.a Range of information		
60 Guidepost	80 Guidepost	100 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 are available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available.

Indian Ocean Bigeye

Bigeye data in the Indian Ocean are reasonably informative containing relevant information on the spatial distribution of catches, size frequencies, fleets, tagging data and alternative growth and mortality models. Environmental factors, such as ENSO cycle, are monitored and some environmental data are available as covariates in CPUE standardization, and this includes which is not directly relevant to the current harvest strategy. These data have been sufficient to conduct assessments and to evaluate the harvest strategy of maintain stocks at or above the biomass that would produce MSY, meeting SG80. There remain significant gaps in the data, however, related to catches, stock structure and fleet operations, such that the range of information is not comprehensive, so SG100 cannot be fully met.

Indian Ocean Yellowfin

Yellowfin data in the Indian Ocean are reasonably informative containing relevant information on the spatial distribution of catches, size frequencies, from numerous fleets, tagging data and alternative growth and mortality models. These data have been sufficient to conduct assessments and to evaluate the harvest strategy to maintain stocks at or above the biomass that would produce MSY. Some environmental data are used as covariates in CPUE standardization and to help explain recruitment dynamics. Stock structure data are limited, but are consistent with an Indian Ocean-wide stock. Overall, data are sufficient to meet SG80. Nevertheless, there are limitations to the data such that one cannot conclude that a comprehensive range of information exists and is available, failing SG100.

Indian Ocean Skipjack

Skipjack data in the Indian Ocean are reasonably informative containing relevant information on the spatial distribution of catches, size frequencies, from numerous fleets, tagging data and alternative

growth and mortality models. These data have been sufficient to conduct an initial assessment and to evaluate whether stocks are maintained at or above the biomass that would produce MSY. Some environmental data are used as covariates in CPUE standardization and to help explain recruitment dynamics. Stock structure data are limited, but are so far consistent with an Indian Ocean-wide stock, although this may change if more tagging is carried out in the western ocean. Overall, the data are sufficient for the harvest strategy at the current level of exploitation, meeting SG80. Nevertheless, there are limitations to the data such that one cannot conclude that a comprehensive range of information exists and is available, so it does not meet SG100.

Indian Ocean Albacore

There are two primary sources of data that drive the stock assessment: total catches and CPUE. These data are considered highly uncertain, but have undergone some investigation and are adequate to support a harvest strategy. Information is incomplete on various issues, such as stock structure, for which a research programme has been commissioned. Information on fleet composition and environmental data is sufficient. Overall, the available data provide some basis for management advice and could support a precautionary harvest strategy, meeting SG60. However, the range of information are insufficient to support the current harvest strategy which appears to target high levels of exploitation, so SG80 is not met.

1.2.3.b Monitoring		
60 Guidepost	80 Guidepost	100 Guidepost
Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.

Indian Ocean Bigeye

Monitoring indices from several fleets' standardized CPUE and from tagging data are adequate for the harvest strategy. The catch history and CPUE series were updated and new information added into the assessment, and evidence suggests that data are improving. Indicators of stock abundance mainly consist of standardised catch-per-unit-effort indices. A single consistent index is not available for the entire time series, but the combined indices do appear to provide some picture of the change in abundance that has occurred. Only the Japanese longline data were used in the 2013 assessment, however, as it was felt to provide the most consistent index of abundance. The Working Party on Tropical Tunas noted on-going significant problems with the available data, in terms of catch and CPUE indices. Overall, data are sufficient for stock assessment and for an appropriate harvest control rule, meeting SG80. However, the data do not presently allow the harvest control rule to be applied with a high degree of certainty, so SG100 is not met.

Indian Ocean Yellowfin

Monitoring indices from several fleets' standardized CPUE and from tagging data are adequate for the harvest strategy. Indicators of stock abundance mainly consist of standardised catch-per-unit-effort indices. A single consistent index is not available for the entire time series, but the combined indices do appear to provide some picture of the change in abundance that has occurred. External reviewers recommended extended use of tagging studies. Data are sufficient to meet the requirements of SG80. However, the data do not presently allow the harvest control rule to be used with great confidence, preventing SG100 being met.

Indian Ocean Skipjack

Monitoring indices from standardized CPUE and from tagging data are adequate for the harvest strategy and current level of exploitation. Indicators of stock abundance consist of standardised catch-per-unit-effort indices. A single consistent index is not available for the entire time series, but the combined indices do appear to provide some picture of the change in abundance that has occurred. The Scientific Committee expressed concerns on the ability of both the available CPUE and to reflect the dynamics of the stock and have requested further investigation. These series drive the skipjack stock assessment results, but may not be good indices of abundance. However, data are sufficient for the application of a precautionary harvest control rule and could be used to develop a harvest control rule meeting the PI 1.2.2 requirements, so SG80 is met. However, the data do not presently allow the harvest control rule with a high degree of certainty, so SG100 is not met.

Indian Ocean Albacore

Monitoring indices from several fleet's standardized CPUE and from tagging data are adequate for the harvest strategy. Indicators of stock abundance mainly consist of standardised catch-per-unit-effort indices. A single consistent index is not available for the entire time series, but the combined indices do appear to provide some picture of the change in abundance that has occurred. External reviewers recommended extended use of tagging studies. Although data are limited, a stock assessment has been successfully completed, demonstrating that data are now sufficient for the appropriate precautionary harvest control rule, so SG80 is met.

1.2.3.c Comprehensiveness of information		
60 Guidepost	80 Guidepost	100 Guidepost
	There is good information on all other fishery removals from the stock.	

Indian Ocean Bigeye

IOTC has put considerable effort into the reporting and recording of all tuna catches by the contracting parties. The current level of reporting is adequate given the number of small countries involved and difficulties in monitoring small vessels and activities in pelagic waters well away from the coast. For example, some countries do not report tuna catch by species, so only estimates are available. Total catches are estimated reasonably well, and data are sufficiently well recorded for the stock assessment and for assessing the level of control sought by IOTC over landed catches. Overall, data are sufficient to meet SG80. While some problems exist, they are being addressed and do not increase the risk for the assessment and management of the stocks.

Indian Ocean Yellowfin

IOTC has put considerable effort into the reporting and recording of all tuna catches by the contracting parties. The current level of reporting is adequate given the number of small countries involved and difficulties in monitoring small vessels and activities in pelagic waters well away from the coast. For example, some countries do not report tuna catch by species, so only estimates are available. Total catches are estimated reasonably well, and data are sufficiently well recorded for the stock assessment and for assessing the level of control sought by IOTC over landed catches. Overall, data are sufficient to meet SG80. While some problems exist, they are being addressed and do not increase the risk for the assessment and management of the stocks.

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data are sufficient to meet SG80. While some problems exist, they are being addressed and do not increase the risk for the assessment and management of the stocks.

Scoring for 1.2.3

Indian Ocean Bigeye: All SG60 and SG80, but no SG100, are met. 80

Indian Ocean Yellowfin: All SG60 and SG80, but no SG100, are met. 80

Indian Ocean Skipjack: All SG60 and SG80, but no SG100, are met. 80

Indian Ocean Albacore: All SG60 and 2 out of 3 SG80 are met. 75

References

IOTC 2014. Report of the Fifth Session of the IOTC Working Party on Temperate Tunas. Busan, Rep. of Korea, 28–31 July 2014. IOTC–2014–WPTmT05–R[E].

IOTC2013. Executive Summary Status of the Indian Ocean bigeye tuna (BET: Thunnus obesus) resource. IOTC-2013-SC16-R[E]

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1.2.4 Assessment of stock status: There is an adequate assessment of the stock status.

1.2.4.a Appropriateness of assessment to stock under consideration		
60 Guidepost	80 Guidepost	100 Guidepost
	The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.

Indian Ocean Bigeye

The main assessment model used for Indian Ocean BET is Stock Synthesis v3 (SS3). Multiple fisheries, gears, and selectivity models have examined and alternative assessment models have been explored, and the most appropriate model configurations have been adopted for the scientific advice. This meets SG80. There are remaining difficulties with key productivity parameters which could change the perception of stock status to some extent. The software allows the model to capture the main features of the stock and fishery, and use all the available data, although it did not make use of the tagging data in the 2013 assessment. Because the available biological information is unable to inform on key life history parameters (“steepness”) and not all data are used yet, the most recent stock assessment configuration has not achieved SG100.

Indian Ocean Yellowfin

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 to take advantage of the available data and to evaluate the impact of uncertainties. Major features of tuna biology are taken into account and the model is able to make use of the available data, including tagging, meeting SG100.

Indian Ocean Skipjack

The primary assessment tool for Indian Ocean skipjack is Stock Synthesis v3 (SS3) which incorporates multiple fisheries, gears, selectivity models and spatial variability. Since the first assessment in 2011, the assessment has improved and has become reliable, with fewer unresolved uncertainties. The assessment approach can use all available data, even if not all data are included in the assessment at the current time. Therefore, the assessment is appropriate for the stock and for the current harvest control rule, meeting SG80. It is as yet unclear whether this model configuration accounts adequately for the main features of this fishery, so it does not meet SG100.

Indian Ocean Albacore

The assessment tools for Indian Ocean albacore cover a spectrum from the complexity of Stock Synthesis v3 (SS3) to the simplicity of ASPIC production model. Both SS3 and ASPIC were considered to offer useful scientific advice. Therefore appropriate models have been identified and used for the stock assessment, meeting SG80, but it has not been clearly demonstrated that these have taken proper account of the biology or the fishery, so SG100 is not met.

1.2.4.b Assessment approach		
60 Guidepost	80 Guidepost	100 Guidepost
The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	

Indian Ocean Bigeye

All tuna stock assessments have been used to estimate the MSY and other reference points, and these have been used to determine stock status. This meets SG80.

Indian Ocean Yellowfin

All tuna stock assessments have been used to estimate the MSY and other reference points, and these have been used to determine stock status. This meets SG80.

Indian Ocean Skipjack

All tuna stock assessments have been used to estimate the MSY and other reference points, and these have been used to determine stock status. This meets SG80.

Indian Ocean Albacore

All tuna stock assessments have been used to estimate the MSY and other reference points, and these have been used to determine stock status. This meets SG80.

1.2.4.c Uncertainty in the assessment		
60 Guidepost	80 Guidepost	100 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.

Indian Ocean Bigeye

Stock assessment methods which have been use report uncertainty in estimates of stock status. Uncertainties have been examined as alternative model configurations and the stock status associated with these alternatives have been evaluated. While weightings among configurations are not statistically rigorous, they represent a consensus of the experts on their relative importance. These probabilities have been carried through the Kobe plots and Kobe strategy matrix (phase diagram of fishing mortality versus SSB at time and projections of the probability of exceeding reference points for alternative catch levels, respectively). Therefore, uncertainty is carried through from the assessment to management advice, meeting SG80 and SG100.

Indian Ocean Yellowfin

Stock assessment methods which have been used report uncertainty in estimates of stock status. Uncertainties have been examined as alternative model structures and the stock status associated

with these alternatives have been evaluated in a probabilistic manner by weighting of the alternatives. While these weightings are not statistically rigorous they represent a consensus of experts on relative importance. These probabilities have been carried through the Kobe plots and Kobe strategy matrix (phase diagram of F versus SSB at time and projections of the probability of exceeding reference points for alternative catch levels, respectively). The use of probability in the management advice allows risk to be taken into account in the decision making, meeting SG100.

Indian Ocean Skipjack

Stock assessment methods which have been used report uncertainty in estimates of stock status. Uncertainties have been examined as alternative model configurations. The stock status associated with alternatives have been evaluated in a probabilistic manner by weighting of the alternatives. While these weightings are not statistical rigorous they represent a consensus of experts on relative importance. These probabilities have been carried through the Kobe plots and Kobe strategy matrix: phase diagram of F versus SSB at time and projections of the probability of exceeding reference points for alternative catch levels, respectively. A decision table is provided to help assess risk. Because the assessment not only takes into account uncertainty, it provides probabilistic output suitable for decision-making, SG100 is met.

Indian Ocean Albacore

The SS3 assessment, and to a lesser extent ASPIC, produces probabilistic output, which is carried forward to management decision making in a Kobe strategy matrix. The strategy matrix evaluates stock status relative to reference points in a probabilistic way, meeting SG100.

1.2.4.d Evaluation of assessment		
60 Guidepost	80 Guidepost	100 Guidepost
		The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.

Indian Ocean Bigeye

The assessment based on SS3 has been tested and the range of plausible models has been evaluated, showing that the assessment is robust. Although alternative assessments approaches and a range of hypotheses have been used to derive alternative results, it is not clear that these have been rigorously explored. This might be addressed by more formal development of hypotheses on model structure to capture uncertainties rather than focusing on different parameter values, for example. Thus, SG100 is not met.

Indian Ocean Yellowfin

Application of Multifan-CL to Indian Ocean yellowfin has been relatively recent. Therefore, there have been some implications of model structure which have not been rigorously explored yet. This prevents the assessment meeting SG100.

Indian Ocean Skipjack

Application of SS3 to skipjack has been relatively recent. Therefore, there have been many implications of model structure which have not yet been rigorously explored. SG100 is not met.

Indian Ocean Albacore

The stock assessment has reviewed a range of models and software in identifying the appropriate approach to the stock assessment. As well as SS3 and ASPIC, software has included Multifan-CL (developed for Pacific tuna), Bayesian biomass dynamics, and age structured production models. However, it may be the way the model is configured rather than the software that needs to be rigorously explored. The Working Party was unable to decide between the two modelling extremes (SS3 vs ASPIC), which suggest that neither was considered robust at this stage of development, so SG100 is not met.

1.2.4.e Peer review of assessment		
60 Guidepost	80 Guidepost	100 Guidepost
	The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.

Indian Ocean Bigeye

The stock assessment of bigeye reviewed through the Working Party for Tropical Tunas of the IOTC's Scientific Committee. Additionally, outside experts were invited to participate in the Working Party meetings. However, the structure of the WP meeting limited the degree of both external and internal review. Additionally, bigeye tuna was a lower priority for this review and subsequent meetings of the Working Party would need to focus on the bigeye assessment. Levels of review are adequate to meet SG80, but not SG100.

Indian Ocean Yellowfin

The stock assessment of yellowfin was primarily conducted by a contracted assessment scientist. The assessment was reviewed through the Working Party for Tropical Tunas of the IOTC's Scientific Committee. Additionally, outside experts were invited to participate in the Working Party meetings. However, the structure of the WP meeting limited the degree of both external and internal review. The review was adequate to meet SG80, but not SG100.

Indian Ocean Skipjack

The stock assessment of skipjack was primarily conducted by IOTC scientists. The assessment was reviewed through the Working Party for Tropical Tunas of the IOTC's Scientific Committee. Additionally, outside experts were invited to participate in the Working Party meetings. This meets SG80. However, the structure of the WP meeting limited the degree of both external and internal review, so SG100 was not met.

Indian Ocean Albacore

The stock assessment of albacore was reviewed through the Working Party on Temperate Tunas of the IOTC's Scientific Committee. There is evidence from the WP report that the stock assessment has been subject to rigorous internal review, but nor external review. Levels of review are adequate to meet SG80, but not SG100.

Scoring for 1.2.4

Indian Ocean Bigeye: All SG60 and SG80 are met, and 1 out of 4 SG100 are met. 85

Indian Ocean Yellowfin: All SG60 and SG80 are met, and 2 out of 4 SG100 are met. 90

Indian Ocean Skipjack: All SG60 and SG80 are met, and 1 out of 4 SG100 are met. 85

Indian Ocean Albacore: All SG60 and SG80 are met, and 1 out of 4 SG100 are met. 85

References

IOTC 2014. Report of the Fifth Session of the IOTC Working Party on Temperate Tunas. Busan, Rep. of Korea, 28–31 July 2014. IOTC–2014–WPTmT05–R[E].

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WCPFC Stocks

1.1 Outcome

1.1.1 Stock Status: The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.

1.1.1.a Stock status relative to recruitment impairment.		
60 Guidepost	80 Guidepost	100 Guidepost
It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.

Western Pacific Bigeye

Biomass has experienced large declines over several decades. The spawning stock was estimated to have been relatively stable during the 1950s, declined rather rapidly through to the mid-1970s and has been undergoing a slow continual decline since. Compared to the unexploited state, the spawning stock was estimated to be most likely 16% B_0 (range across four alternative models 14%-18%). The newly adopted limit reference point of 20%B_0 is taken here to be the PRI. Therefore, it is not likely that it is above the point where recruitment would be impaired, so SG60 is not met.

Western Pacific Yellowfin

Initial recruitment was relatively high but declined during the 1950s and 1960s. Estimated Recruitment remained relatively constant from the 1980s. There is no clear stock recruitment relationship, with different levels of assumed steepness for the SR model giving the same recruitment estimates.

The Commission has now formally adopted a limit reference points (20%B_0) which is here treated as the PRI. This PRI is consistent with the default MSC PRI for stocks of medium productivity.

The spawning stock estimate B_{2012}/B_0 = 38% compared to the newly adopted limit reference point of 20%B_0 (range 35-40% across all four alternative models). Because the stock is well above, and the estimated range excludes, the precautionary limit reference point, SG100 is met.

Western Pacific Skipjack

The major conclusions of the 2014 stock assessment were that the stock is not in an overfished state and is not subject to overfishing. Current biomass is estimated at 48% B_0, with estimates ranging 46-50% for different model sensitivity analyses. This indicates the stock is well above the recently adopted limit reference point (20% B_0), which is taken here as being the PRI. Because there is a very low probability of recruitment overfishing occurring, with a high degree of certainty that the stock is above the point where recruitment would be impaired, SG100 is met.

1.1.1.b Stock status in relation to achievement of Maximum Sustainable Yield (MSY).		
60 Guidepost	80 Guidepost	100 Guidepost
	The stock is at or fluctuating around a level consistent with MSY.	There is a **high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.

Western Pacific Bigeye

The estimates of spawning biomass for 2012 are below the level that will support the MSY. B_{2012}/B_{MSY} = 77% for the base case model, with a range 62%-96% across all four alternative models. This is a significant change in the perceived stock status compared to the 2011 assessment. Therefore, the 2014 assessment indicated that spawning biomass is below B_{MSY}, and therefore below the target region of WCPFC, which fails to meet SG80.

It should be noted that the adopted limit reference point (20% B_0) is now very close to the estimated B_{MSY} from the analytical assessment. It is not clear that they are consistent. The analytical estimate of B_{MSY} may not be sufficiently precautionary, so that year-to-year errors in the stock assessment could result in the stock periodically being below the limit reference point even when it is fluctuating around the B_{MSY} point.

Western Pacific Yellowfin

Fishing mortality has generally been increasing through time, and for the reference case $F_{2008\text{-}11}$ is estimated to be 0.72 times the fishing mortality that will support the MSY. Across the four models (base case and three sensitivity models) $F_{2008\text{-}11}/F_{MSY}$ ranged from 0.58 to 0.90. This indicates that overfishing is not occurring for the WCPO yellowfin tuna stock, however latest catches are close to or exceed the MSY by up to 4%.

The estimate of spawning biomass for 2012 are above the level that will support the MSY: B_{2012}/B_{MSY} = 1.24 (range 1.05-1.51 across all four alternative models). Based on this assessment, there is a high degree of certainty that the stock is above the MSY level, so SG100 is met.

Western Pacific Skipjack

The 2014 stock assessment found that estimates of 2011 spawning biomass are above both the level that will support the MSY (B_{2011}/B_{MSY} = 1.74 for the base case and range 1.45 - 2.10 across the four sensitivity models). Although fishing mortality has generally been increasing through time, current fishing mortality is below the MSY level ($F_{2008\text{-}11}/F_{MSY}$=0.61 for the base case and range 0.45 - 0.82 across the four sensitivity models). This indicates that there is a high degree of certainty that the stock has been above MSY and will remain above MSY unless directed fishing effort increases substantially. This meets SG100.

Scoring for 1.1.1

Western Pacific Bigeye: The SG60 is not met. 50

Western Pacific Yellowfin: All SG60, SG80 and SG100 are met. 100

Western Pacific Skipjack: All SG60, SG80 and SG100 are met. 100

References

Davies, N., Harley, S., J. Hampton, S. McKechnie. 2014. Stock assessment of yellowfin tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-04

Harley, S., N. Davies, J. Hampton, S. McKechnie. 2014. Stock assessment of bigeye tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-01

Rice, J. S. Harley, N. Davies, J. Hampton. 2014. Stock assessment of skipjack tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-05

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1.1.2 Stock Rebuilding: Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe.

1.1.2.a Rebuilding timeframes		
60 Guidepost	80 Guidepost	100 Guidepost
A rebuilding timeframe is specified for the stock that is the **shorter of 20 years or 2 times its generation time**. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock.

Western Pacific Bigeye

No rebuilding timeframe has been specified yet. The catch limits applied to longline are planned to reduce catches by around 14% over the period 2014-2017. In addition, limits have been placed on purse seine fishing effort and measures are likely to reduce the juvenile bigeye catch, but by how much is unclear. The fishing mortality was estimated to be significantly above the MSY level in 2012, and it is unclear by how much current measures will reduce fishing mortality or whether they will be entirely successful. Unless exploitation levels are successfully reduced, the stock will not rebuild to score PI1.1.1 at SG80, so SG60 is not yet met.

1.1.2.b Rebuilding evaluation		
60 Guidepost	80 Guidepost	100 Guidepost
Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is **evidence** that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.	There is **strong evidence** that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.

Western Pacific Bigeye

There have been significant recent improvements in the available data and the stock assessment. In addition, a precautionary limit reference point has been adopted for this stock, which should help guide rebuilding strategy. The level of monitoring is sufficient to determine whether rebuilding strategies will be effective, meeting SG60.

Fishing mortality has generally been increasing through time, and the average fishing mortality 2008-11 ($F_{2008\text{-}11}$) is estimated to be 1.57 F_{MSY}, with $F_{2008\text{-}11}/F_{MSY}$ ranged from 1.27 to 1.95 across four alternative models. This is similar to the 32% reduction from 2006-2009 levels recommended from the 2011 assessment. There is no evidence yet of a successful reduction in catch levels since the late 1990s. It remains unclear whether the planned reduction to 2017 will be sufficient to initiate rebuilding. Therefore, the monitoring indicates that the current strategy will not be effective at rebuilding the stock, so SG80 is not met.

Scoring for 1.1.2

Western Pacific Bigeye: Only 1 out of 2 SG60 are met. 50

References

Harley, S., N. Davies, J. Hampton, S. McKechnie. 2014. Stock assessment of bigeye tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-01

WCPFC. 2014. Tenth Regular Session of the Scientific Committee. Majuro, Republic of the Marshall Islands, 6-14 August 2014. Summary Report.

1.2 Harvest Strategy (Management)

1.2.1 Harvest Strategy: There is a robust and precautionary harvest strategy in place.

1.2.1.a Harvest strategy design		
60 Guidepost	80 Guidepost	100 Guidepost
The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.

Western Pacific Bigeye

The general objective of the WCPFC is to maintain populations of tunas and tuna-like fishes at levels that will permit maximum sustainable yield (MSY). A specific commitment to long-term sustainable fisheries management was adopted at the Western and Central Pacific Fisheries Commission in 2014, but has not been implemented yet. This commitment applies across all fisheries within the commission.

The harvest strategy seeks to maintain the Western Pacific bigeye at a level that can support MSY. The harvest strategy (CMM-2013-01) states that the fishing mortality rate for bigeye tuna will be reduced to a level no greater than F_{MSY} (i.e. $F/F_{MSY} \leq 1$), and that this objective shall be achieved through step by step approach through to 2017. Management measures for 2014-2017 include limitations on FAD sets and fishing days for purse seine (which tend to catch juvenile bigeye and yellowfin), and catch limits on longline from which most of the fishing mortality is derived. The catch limits are planned to reduce catches by around 14% over the period, and it is not clear that this will be sufficient to initiate rebuilding required here. Simulations suggest that if the catch reductions are achieved and recruitment remains around the 2002-2011 level, the risk that the stock will be below the limit reference point is reduced to 4%. However, current levels of fishing and the current stock state indicate that the harvest strategy has so far not been responsive to state of the stock over a number of years. Therefore, until the harvest strategy is able to show responsiveness to the scientific advice with clear improvements in stock status, SG80 cannot be met.

Western Pacific Yellowfin

The general objective of the WCPFC is to maintain populations of tunas and tuna-like fishes at levels that will permit maximum sustainable yield (MSY). A specific commitment to long-term sustainable fisheries management was adopted at the Western and Central Pacific Fisheries Commission in 2014, but has not been implemented yet. This commitment applies across all fisheries within the commission.

The harvest strategy (CMM-2013-01) states that the fishing mortality rate for yellowfin tuna will be maintained at a level no greater than F_{MSY} (i.e. $F/F_{MSY} \leq 1$). Management measures for 2014-2017 include limitations on FAD sets and fishing days for purse seine (which tend to catch juvenile bigeye and yellowfin), and limits on catches for longline not to increase from current levels. However, catch

limits are planned to reduce bigeye catches by around 14% over 2014-2017, which could also decrease longline catches of yellowfin.

There was a dramatic decline in the MSY in the 1970s follows the increased development of those fisheries that catch younger yellowfin, principally the small-fish fisheries in the west equatorial region. This suggests that the selectivity is not optimal with respect to yield and fishery may be subject to vulnerable to “growth overfishing”.

The new management measures, and more specific controls on the bigeye fishery can be expected to eventually meet management objectives. But not all issues are addressed and, for example, some fisheries have been excluded from the requirements on capacity reduction as they intend to develop their fisheries. It is not yet clear that the strategy is responsive to stock status or that all its components are working together effectively, so SG80 is not met.

Western Pacific Skipjack

The general objective of the WCPFC is to maintain populations of tunas and tuna-like fishes at levels that will permit maximum sustainable yield (MSY). A specific commitment to long-term sustainable fisheries management was adopted at the Western and Central Pacific Fisheries Commission in 2014, but has not been implemented yet. This commitment applies across all fisheries within the commission.

The harvest strategy (CMM-2013-01) states that the fishing mortality rate for skipjack tuna will be maintained at a level no greater than F_{MSY} (i.e. $F/F_{MSY} \leq 1$). Management measures for 2014-2017 include limitations on FAD sets and fishing days for purse seine.

The new management measures, and more specific controls on the bigeye fishery, can be expected to meet management objectives in the short term, as they limit purse seine activities. This meets SG60. Specific management measures are directed at bigeye tuna rather than skipjack, so objectives for skipjack cannot be assured. Not all issues are addressed and, for example, some fisheries have been excluded from the requirements on capacity reduction as they intend to develop their fisheries. It is not yet clear that the strategy is responsive to stock status or that all its components are working together effectively, so SG80 is not met.

1.2.1.b Harvest strategy evaluation		
60 Guidepost	80 Guidepost	100 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.

Western Pacific Bigeye

The general approach to management is likely to work in the long term as capacity and effort controls should lead to a limit on fishing mortality, meeting SG60. Overall, there is no evidence for an overall catch reduction yet, although longline catches have been reducing in recent years. New management measures are expected to limit and reduce bigeye fishing mortality. However, given

the status of the stock and the discussion above, the harvest strategy has not been meeting its objectives, so there is no specific evidence of success yet. It has yet to be shown that the management system can maintain stock at the target level ($B>B_{MSY}$, $F<F_{MSY}$), which does not meet SG80.

Western Pacific Yellowfin

In the case of the Western Pacific yellowfin stock, the fishing mortality has not been excessive but appears to be growing. The assessment showed that the stock is not undergoing overfishing and is not overfished. Monitoring of catches and fishing effort and size composition is in place and catches have been reasonably stable for the last 10 years. Projections of the current level of exploitation indicate that it was very unlikely (<1%) that the stock would fall below the limit reference point by 2032, or that fishing mortality will increase above F_{MSY} levels. Assuming low recent recruitment continued it was very unlikely (<10%) that the yellowfin stock would fall below the B_{MSY}. Therefore evidence exists that the current constraints on fishing mortality are probably adequate to maintain the stock above B_{MSY}. Overall, the harvest strategy has not been well-defined and has not been fully evaluated, so it meets SG80, but not SG100.

Western Pacific Skipjack

In the case of the Western Pacific skipjack stock, the fishing mortality has not been beyond the MSY level, appears to be growing, and the stock is very unlikely to be overfished. Monitoring of catches and fishing effort and size composition is in place. Projections of the current level of exploitation indicate that it was very unlikely (<1%) that the stock would fall below either the limit reference point level or B_{MSY} level by 2032, or that fishing mortality will increase above F_{MSY} levels. Therefore, evidence exists that the current constraints on fishing mortality are probably adequate to maintain the stock above B_{MSY}. This meets SG80. However, the harvest strategy is dependent upon general limits on fishing activity rather than directed controls specific to the skipjack stock, and has not been fully evaluated and therefore does not meet SG100.

1.2.1.c Harvest strategy monitoring		
60 Guidepost	80 Guidepost	100 Guidepost
Monitoring is in place that is expected to determine whether the harvest strategy is working.		

Western Pacific Bigeye

Monitoring is adequate to determine whether the harvest strategy is working. The different parts of the strategy include reducing capacity overall, increasing the mean size and reducing catches from the main fisheries. Data are collected to estimate these quantities. Also the stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not. This meets SG60.

Western Pacific Yellowfin

Monitoring is adequate to determine whether the harvest strategy is working. The different parts of the strategy include holding catches at around current level or lower. Data are collected to estimate these quantities. Also the stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not. Therefore, the fishery clearly meets SG60.

Western Pacific Skipjack

Monitoring is adequate to determine whether a harvest strategy is working. Catch and effort are monitored to estimate total catch, CPUE and mean size. The stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not, meeting SG60.

1.2.1.d Harvest strategy review		
60 Guidepost	80 Guidepost	100 Guidepost
		The harvest strategy is periodically reviewed and improved as necessary.

Western Pacific Bigeye

There is no evidence of any formal review of the bigeye harvest strategy, so this does not yet meet SG100. There is stated intention to evaluate the current strategy as it progresses, but this falls short of a formal review, although it may still lead to improvements as rebuilding progresses.

Western Pacific Yellowfin

There has not been a formal review of the harvest strategy by the WCPFC, although the Scientific Committee has initiated efforts to provide the scientific options for a harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible. There is stated intention to evaluate the current strategy as it progresses, but this falls short of a formal review, although it may still lead to improvements. Therefore, it does not meet SG100.

Western Pacific Skipjack

There is no evidence of any formal review of the skipjack harvest strategy, so this does not yet meet SG100. There is stated intention to evaluate the current strategy as it progresses, but this falls short of a formal review, although it may still lead to improvements as rebuilding progresses.

Scoring for 1.2.1

Western Pacific Bigeye: All SG60, but no SG80, are met. 60

Western Pacific Yellowfin: All SG60 and 1 out of 2 SG80 are met. 70

Western Pacific Skipjack: All SG60 and 1 out of 2 SG80 are met. 70

References

CMM-2013-01. Conservation and Management Measure for Bigeye, Yellowfin and Skipjack Tuna in the Western and Central Pacific Ocean. Conservation and Management Measure 2013-01. Commission Tenth Regular Session, Cairns, Australia, 2-6 December 2013.

Davies, N., Harley, S., J. Hampton, S. McKechnie. 2014. Stock assessment of yellowfin tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-04

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WCPFC. 2014. Tenth Regular Session of the Scientific Committee. Majuro, Republic of the Marshall Islands, 6-14 August 2014. Summary Report.

1.2.2 Harvest control rules and tools: There are well defined and effective harvest control rules (HCRs) in place.

1.2.2.a HCRs design and application		
60 Guidepost	80 Guidepost	100 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** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.

Western Pacific Bigeye

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. Any action being taken was not pre-agreed. Indeed the slow response of management measures to the scientific advice indicates a lack of a well-defined HCR. This meets SG60, but not SG80. The Scientific Committee has been working to define options that should begin to be available in 2015. Therefore HCR are still in the development stage.

Western Pacific Yellowfin

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. Any action being taken was not pre-agreed. Indeed the slow response of management measures to the scientific advice indicates a lack of a well-defined HCR. This meets SG60, but not SG80. The Scientific Committee has been working to define options that should begin to be available in 2015. Therefore HCR are still in the development stage.

Western Pacific Skipjack

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. Any action being taken was not pre-agreed. Indeed the slow response of management measures to the scientific advice indicates a lack of a well-defined HCR. This meets SG60, but not SG80. The Scientific Committee has been working to define options that should begin to be available in 2015. Therefore HCR are still in the development stage.

1.2.2.b HCRs robustness to uncertainty		
60 Guidepost	80 Guidepost	100 Guidepost
	The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.

Western Pacific Bigeye

It is not possible to evaluate the harvest control in relation to uncertainties, because the HCR has not been defined well enough to do so. Therefore SG80 cannot be met.

Western Pacific Yellowfin

It is not possible to evaluate the harvest control in relation to uncertainties, because the HCR has not been defined well enough to do so. Therefore SG80 cannot be met.

Western Pacific Skipjack

It is not possible to evaluate the harvest control in relation to uncertainties, because the HCR has not been defined well enough to do so. Therefore SG80 cannot be met.

1.2.2.c HCRs evaluation		
60 Guidepost	80 Guidepost	100 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 HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.

Western Pacific Bigeye

The primary interest is in reducing bigeye exploitation, through limiting effort and catches. There is some evidence that longline catches can be reduced. Juvenile fishing mortality is high, but has not increased overall since the late 1990s, whereas adult fishing mortality shows an increasing trend even over the most recent years. Evidence that the current level of control is adequate is partial at best, although there are clearly more tools available in reducing effort and catches. This merits a score of at best of SG60, and if conservation measures continue to be ineffective, may lead to outright failure. Any failure for this stock would also undermine confidence that effective controls are in reality available for other WCPFC stocks.

Western Pacific Yellowfin

The current level of control, mainly through access rights and licensing, has resulted in sustainable catch levels for yellowfin tuna, partly as a result of responses to protecting more vulnerable bigeye

tuna. Therefore, the monitoring data suggest current levels of fishing effort are sustainable, but limits on fishing capacity and their relationship to quantities in the stock assessment are not clear. The tools appear to have been effective in controlling exploitation, but with clauses to allow fishery development, it is unclear how effective current measures will be. With some evidence that tools have been effective, SG60 is met, but evidence is limited that they would be appropriate for a HCR required by SIa and SIb, so SG80 is not met.

Western Pacific Skipjack

The current level of control, mainly through access rights and licensing, has resulted in sustainable catch levels for skipjack tuna. Therefore, the monitoring data suggest current levels of fishing effort are sustainable. Limits on fishing capacity and their relationship to quantities in the stock assessment are not clear. The tools appear to have been effective in controlling exploitation either by happenstance or design, but detailed information on capacity controls was unavailable. There is some evidence current tools are adequate to limit harvest, meeting SG60. However, evidence is incomplete, particularly whether controls are sufficient for the timely reduction in fishing mortality.

Scoring for 1.2.2

Western Pacific Bigeye: All SG60, but no SG80, are met. 60

Western Pacific Yellowfin: All SG60, but no SG80, are met. 60

Western Pacific Skipjack: All SG60, but no SG80, are met. 60

References

CMM-2013-01. Conservation and Management Measure for Bigeye, Yellowfin and Skipjack Tuna in the Western and Central Pacific Ocean. Conservation and Management Measure 2013-01. Commission Tenth Regular Session, Cairns, Australia, 2-6 December 2013.

Davies, N., Harley, S., J. Hampton, S. McKechnie. 2014. Stock assessment of yellowfin tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-04

Harley, S., N. Davies, J. Hampton, S. McKechnie. 2014. Stock assessment of bigeye tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-01

Rice, J. S. Harley, N. Davies, J. Hampton. 2014. Stock assessment of skipjack tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-05

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WCPFC. 2014. Tenth Regular Session of the Scientific Committee. Majuro, Republic of the Marshall Islands, 6-14 August 2014. Summary Report.

1.2.3 Information / monitoring: Relevant information is collected to support the harvest strategy.

1.2.3.a Range of information		
60 Guidepost	80 Guidepost	100 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 are available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available.

Western Pacific Bigeye

Sufficient information (on stock structure, stock productivity, fleet composition), is available to monitor and assess stock status including; tagging data, catch reporting and size-frequency sampling by each fleet and catch-per-unit-effort data from these fleets. This is sufficient to support the harvest strategy as well as evaluate alternative management measures, such as seasonal area closures. The information is sufficient to develop and evaluate the harvest strategy, meeting SG80. However, while the range of data is wide, it is not clear that data collection is comprehensive. Although all the major fleets report adequate information, these data are not necessarily complete and there remains concern over the accuracy of some sources of data, so SG100 is not attained.

Western Pacific Yellowfin

Sufficient information (on stock structure, stock productivity, fleet composition), is available to monitor and assess stock status including; tagging data for stock identification, catch reporting and size-frequency sampling by each fleet, and catch-per-unit-effort data from these fleets.

Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with likely and best practice HCRs, and indicators of catch and effort are available and monitored with sufficient frequency to support catch or effort-related HCRs. In addition, there is observer coverage for some fleets (targets 100% purse seine and 5% longliners), as well as port sampling and transshipment monitoring.

While the range of data is wide and sufficient for the harvest strategy, meeting SG80, it is not clear the data collection systems will support the detail of the management that has recently been implemented, particularly taking into poorer coverage in some countries, so SG100 is not met.

Western Pacific Skipjack

Sufficient information (on stock structure, stock productivity, fleet composition) is available to monitor and assess stock status including; tagging data for stock identification, catch reporting and size-frequency sampling by each fleet and catch-per-unit-effort data from these fleets. In addition, there is an observer programme (100% coverage for purse seine since 2010), port sampling and transshipment monitoring. Given the current stock status and on-going improvements in data collection to support the harvest strategy, SG80 is met.

Although information is good, it is not complete and cannot be described as comprehensive. Reporting of catch and other data are not complete from some countries where significant catches are taken. However there are a number of on-going initiatives to strengthen data collection in Indonesia, Philippines and Vietnam. While the range of data is wide, sufficiently supporting the stock assessment, it is not clear the data collection systems will support the detail of the management that has recently been implemented, failing to meet SG100.

1.2.3.b Monitoring		
60 Guidepost	80 Guidepost	100 Guidepost
Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.

Western Pacific Bigeye

Fishery removals and stock abundance are monitored at a level that is sufficient for the current harvest strategy and assessment, meeting SG80. However, there is no well-defined harvest control rule. Additionally, recent agreed-upon management actions which have yet to be fully implemented may require additional information. There is also an issue over whether data are collected for analyses in a timely manner to allow evaluation of management controls, with a near 2 year delay between assessment and the latest stock estimate. In addition there is an observer programme for some larger fleets (targets are 100% coverage for purse seine and 5% for longline), port sampling and transshipment monitoring.

While the data are adequate for a suitable harvest control rule, uncertainties in data are significant and not necessarily fully understood, so SG100 is not met. The abundance indices depend on commercial fishing activities which may introduce bias to the index. While indices are standardized, the uncertainties are not necessarily well understood and may change over time. For example, catchability may change by area or there may be “hyperstability”, where fishing activity will focus on areas of high abundance so that a decline in the overall stock is underestimated. Also, catches by some nations remain uncertain.

Western Pacific Yellowfin

Fishery removals and stock abundance are monitored at a level that is sufficient for the current harvest controls and assessment, meeting SG80. Current data can be used to generate abundance indices, catches, fishing effort, selectivity estimates, which are adequate to support the harvest control rule, meeting SG80.

While the data are adequate for a suitable harvest control rule, uncertainties in data are significant and not necessarily fully understood. The abundance indices depend on commercial fishing activities which may not be well understood and may change over time (e.g. “hyperstability”). Data are also clearer poorer from some fisheries, and while this is being addressed, these data remain a problem for the assessment. This prevents SG100 being met.

Western Pacific Skipjack

That information is sufficient to determine stock status and therefore implement a harvest control rule is clearly demonstrated. Indicators include CPUE time series and size / age composition from the catches. These are regularly monitored and cover the whole stock. While the data are adequate for a suitable harvest control rule meeting the SG80, uncertainties in data are significant and not necessarily fully understood. The abundance indices depend on commercial fishing activities which may introduce bias to the index. While indices are standardized, the uncertainties are not necessarily well understood and may change over time. Not all countries are covering their fisheries, so there are gaps in the data. Therefore because not all information is available and significant uncertainties in some data exist, SG100 is not met.

1.2.3.c Comprehensiveness of information		
60 Guidepost	80 Guidepost	100 Guidepost
	There is good information on all other fishery removals from the stock.	

Western Pacific Bigeye

Catches of tuna are measured and monitored well enough for stock assessment and the harvest strategy. Although monitoring of catches in some areas is far from perfect, these do not pose an unacceptable risk to the harvest strategy. There are a number of on-going initiatives to strengthen data collection of member states. Overall, this meets SG80.

Western Pacific Yellowfin

Catches of tuna are measured and monitored well enough for stock assessment and the harvest strategy. Although monitoring of catches in some areas is far from perfect, these do not pose an unacceptable risk to the harvest strategy. There are a number of on-going initiatives to strengthen data collection of member states. Overall, this meets SG80.

Western Pacific Skipjack

Catches of tuna are measured and monitored well enough for stock assessment and the harvest strategy. Although monitoring of catches in some areas is far from perfect, these do not pose an unacceptable risk to the harvest strategy. There are a number of on-going initiatives to strengthen data collection of member states. Overall, this meets SG80.

Scoring for 1.2.3

Western Pacific Bigeye: All SG60 and SG80, but no SG100, are met. 80

Western Pacific Yellowfin: All SG60 and SG80, but no SG100, are met. 80

Western Pacific Skipjack: All SG60 and SG80, but no SG100, are met. 80

References

Davies, N., Harley, S., J. Hampton, S. McKechnie. 2014. Stock assessment of yellowfin tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-04

Harley, S., N. Davies, J. Hampton, S. McKechnie. 2014. Stock assessment of bigeye tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-01

Rice, J. S. Harley, N. Davies, J. Hampton. 2014. Stock assessment of skipjack tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-05

WCPFC. 2014. Tenth Regular Session of the Scientific Committee. Majuro, Republic of the Marshall Islands, 6-14 August 2014. Summary Report.

1.2.4 Assessment of stock status: There is an adequate assessment of the stock status.

1.2.4.a Appropriateness of assessment to stock under consideration		
60 Guidepost	80 Guidepost	100 Guidepost
	The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.

Western Pacific Bigeye

The most recent assessment of bigeye tuna in the WCPO was conducted in 2014 using the Multifan-CL software. The bigeye tuna model is age and spatially structured (9 regions) and the catch, effort, size composition and tagging data used in the model are classified by 33 fisheries and quarterly time periods from 1952 to 2012. The assessment included a range of model options and sensitivities that were applied to investigate key structural assumptions and sources of uncertainty in the assessment. The model has and continues to be developed over the years with frequent supporting analysis and research and workshops. It is able to account for major features of the biology of the species and makes use of the available data, meeting SG100.

Western Pacific Yellowfin

The most recent 2014 assessment uses the stock assessment model and software Multifan-CL (MFCL). The yellowfin tuna model is age and spatially structured (9 regions) and the catch, effort, size composition and tagging data used in the model are classified by 33 fisheries and quarterly time periods from 1952 through 2012. The assessment included a range of model options and sensitivities that were applied to investigate key structural assumptions and sources of uncertainty in the assessment. Because the assessment makes good use of the available data and includes the ability to account for important factors in tuna biology, this meets SG100.

Western Pacific Skipjack

Skipjack stock assessments have been carried out using MULTIFAN-CL modelling of the population dynamics of the stock and the fisheries operating on it, using maximum posterior likelihood estimates to fit a range of parameters. The model is age and spatially structured, in the case of skipjack with 16 quarterly age-classes, and 5 spatial regions in the 2014 assessment. It uses catch, effort, size composition, and tagging data in the model, grouped into 23 fisheries and quarterly time periods from 1972 through 2012. These fisheries, or fleets, are modelled with respect to their selectivity by size, areas fished and standardized catch per effort. The assessment accounts for the major features of the species biology and the fishery, meeting SG100.

1.2.4.b Assessment approach		
60 Guidepost	80 Guidepost	100 Guidepost
The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	

Western Pacific Bigeye

The stock assessments have been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

Western Pacific Yellowfin

The stock assessments have been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

Western Pacific Skipjack

The stock assessments have been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

1.2.4.c Uncertainty in the assessment		
60 Guidepost	80 Guidepost	100 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.

Western Pacific Bigeye

The assessment evaluates uncertainty in terms of alternative model structures and addresses uncertainty in data and observations, with critical uncertainties represented across the sensitivity analyses. This meets SG80. However, although the uncertainty accounted for as probabilities, it is not presented in a way that can be used decision making; for example in making clear risk-based decisions (e.g. “Kobe II matrices”). This prevents the fishery meeting SG100.

Western Pacific Yellowfin

Alternative model structures for MFCL have been applied to the available data and results are reported as a range of outcomes resulting from the model structures. This is useful for evaluating uncertainty relative to general determinations of stock status, which meets SG80. Probabilistic results are reported, but not in a form which can be easily used in decision-making. Specifically, advice is not using such tools as the Kobe II harvest strategy matrix, which explicitly addresses risks in harvest levels. Therefore SG100 is not met.

Western Pacific Skipjack

Alternative assumptions have been applied in 4 stock assessments (sensitivity analyses) which are reported to cover the likely range of stock status and other values of interest. Errors are assessed in each assessment in standard ways, and the software is able to report results probabilistically in each case (e.g. likelihood profiles, MCMC simulations). These outputs are useful for evaluating uncertainty relative to general determinations of stock status, and it is clear that uncertainty is taken into account, meeting SG80. While probability based estimates are reported, these are not in a form which can be used directly in decision-making; for example in making clear risk-based decisions (e.g. “Kobe II matrices”). This prevents the fishery meeting SG100.

1.2.4.d Evaluation of assessment		
60 Guidepost	80 Guidepost	100 Guidepost
		The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.

Western Pacific Bigeye

Although the stock assessment process is rigorous, including reviews of data and models through pre-assessment workshops, it is not clear that a full range of possibilities have been considered. The most recent assessment in 2014 has not yet been shown to be robust, and it is not clear that all alternative hypotheses about this stock have been explored. SG100 is not yet met.

Western Pacific Yellowfin

While the assessment and its alternatives provide results that are robust to general determinations of stock status, it is unclear whether these estimates will be accurate enough for the harvest control rules that might be implemented in the future. Further evidence would also be required to show that the set of hypotheses that have been considered in sensitivity analyses, for example, cover all likely possibilities. This does not meet SG100.

Western Pacific Skipjack

Alternative model structures for Multifan-CL have been applied to the available data and results are reported as a range of outcomes resulting from the model structures. This is useful but falls short of a rigorous exploration of alternative hypotheses and approaches to assessment. While the assessment and its alternatives provide results that are robust to general determinations of stock status, it is unclear whether these estimates will be accurate enough for the harvest control rules

that might be implemented in the future. Further evidence would be required to show that the set of hypotheses that have been considered in sensitivity analyses, for example, cover all likely possibilities. Without this, the stock assessment does not attain SG100.

1.2.4.e Peer review of assessment		
60 Guidepost	80 Guidepost	100 Guidepost
	The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.

Western Pacific Bigeye

The assessment is subject to internal peer review through the WCPFC SC and preparatory workshops are held before the stock assessment takes place to review data and the approach. An external peer review was completed for the 2011 stock assessment, which was published in 2012. Although there has been no specific external review for the 2014, it incorporates recommendations from the 2012 external review. Overall this process meets the requirement for SG100.

Western Pacific Yellowfin

The assessment is subject to internal peer review through the WCPFC SC. In addition, the assessment was subject to an external peer review in 2009 and relevant guidance was used from the 2012 external review directed at bigeye. Overall, the assessment process is using external and internal review to improve the stock assessment, which attains SG100.

Western Pacific Skipjack

The assessment is subject to internal peer review through the WCPFC SC, meeting SG80. The WCPFC is also beginning to apply an external peer review process but this has not been applied directly to this assessment. Nevertheless, recommendations were taken from the bigeye assessment to apply to this assessment. Given the similarities between the data and methods, this could be accepted as a partial external review. However, differences of this assessment to the yellowfin and bigeye assessments are probably significant enough not to accept this as a full external peer review, so SG100 is not met.

Scoring for 1.2.4

Western Pacific Bigeye: All SG60 and SG80 are met, and 2 out of 4 SG100 are met. 90

Western Pacific Yellowfin: All SG60 and SG80 are met, and 2 out of 4 SG100 are met. 90

Western Pacific Skipjack: All SG60 and SG80 are met, and 1 out of 4 SG100 are met. 85

References

Davies, N., Harley, S., J. Hampton, S. McKechnie. 2014. Stock assessment of yellowfin tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-04
Harley, S., N. Davies, J. Hampton, S. McKechnie. 2014. Stock assessment of bigeye tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-01
Ianelli, J, Maunder, M., Punt, A.E. Independent Review of 2011 WCPO Bigeye Tuna Assessment. WCPFC-SC8-2012/SA-WP-01
Rice, J. S. Harley, N. Davies, J. Hampton. 2014. Stock assessment of skipjack tuna in the central and western Pacific Ocean. WCPFC-SC10-2014/SA-WP-05
WCPFC. 2014. Tenth Regular Session of the Scientific Committee. Majuro, Republic of the Marshall Islands, 6-14 August 2014. Summary Report.

IATTC Stocks

1.1 Outcome

1.1.1 Stock Status: The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.

1.1.1.a Stock status relative to recruitment impairment.		
60 Guidepost	80 Guidepost	100 Guidepost
It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.

Eastern Pacific Bigeye

Since the start of 2005, the spawning stock gradually increased to a level of 30% B_0 at the start of 2010, attributed to a combined effect of a series of above-average recruitments since 2001, the IATTC tuna conservation resolutions during 2004-2009, and decreased longline fishing effort. However, although the resolutions have continued to date, the rebuilding trend was not sustained, and the spawning biomass has declined to 19% B_0. This decline could be related to a period dominated by below-average recruitments that began in late 2007 and coincides with a series of particularly strong La Niña events.

IATTC limit reference points (LRP) have been proposed of 0.38 B_{MSY} and 1.6 F_{MSY}, which in the stock assessment model corresponded to a 50% reduction in recruitment from its average unexploited level based on a conservative steepness value (h = 0.75) for the Beverton-Holt stock-recruitment relationship. However, it is not clear that the IATTC LRP is precautionary enough for use as the MSC PRI required for this performance indicator, as the IATTC LRP is effectively 7.6% B_0. The default MSC PRI should be 75% B_{MSY} if B_{MSY} is estimated below 27% B_0 as in the base case assessment, or 50% B_{MSY} if above 27% B_0 as in the precautionary sensitivity analysis assessment (see MSC CR2.0 SA2.2.3). For either case, this suggests a default value of 15% B_0 for the PRI, rather than using the IATTC LRP. Note also that MSC guidance suggests this would apply to “some highly productive stocks”, but in this case the low B_{MSY} may be the result of selectivity patterns rather than productivity of the stock, so it is also unclear whether the analytical determination of MSY is consistent with the MSC definition. The base case assessment suggests that the stock is above this level, although the precautionary sensitivity analysis suggests the stock is on the MSC PRI. The net result suggests the stock is likely above MSC PRI, meeting SG60, but not highly likely above the PRI, failing SG80.

Eastern Pacific Yellowfin

Recent EPO yellowfin assessments use an integrated statistical age-structured stock assessment model (Stock Synthesis v3) to assess the tuna stock. The status of the stock of yellowfin in the EPO results in estimates of spawning biomass, yield per recruit, MSY and other parameters.

For EPO yellowfin, MSY is accepted as a target, but there is no limit reference point. The PRI would be below the MSY target. Note that B_{MSY} is estimated to occur at $27\%B_0$ and the default MSC guidance is a limit of 50% B_{MSY} (CR2.0 SA2.2.3), which is $13\%B_0$. The current 2013 assessment indicates that spawning biomass is estimated to be $26\%B_0$, with lower range from sensitivity of $19\%B_0$. Therefore, it is "highly likely" that the stock is above PRI, meeting SG80. However, the available evidence is insufficient to state this with a high degree of certainty due to the limited sensitivity runs and lack of reporting confidence intervals, for example, so not SG100 is not met.

Eastern Pacific Skipjack

The last stock assessment was completed in 2012, and eight data- and model-based indicators were updated and used to evaluate relative status in 2014. These consist of catch, 2 CPUE indices, effort, average catch weight, exploitation rate, recruitment and biomass. The average weight of skipjack has been declining since 2000, and in 2009 was below the lower reference level, but increased slightly in 2010 and 2011. These all suggest an increase in fishing mortality until a recent decline 2009-2011.

No PRI has been defined for this stock. However, indicators of recruitment suggest these have remained above the long-term average since 2000. None of the indicators detect any adverse consequences from current levels of exploitation, except smaller average weight, which is very unlikely to indicate any effect on recruitment. Given this and the resilient life history characteristics of skipjack, it is highly likely that the stock is above any PRI, meeting SG80.

The last full assessment was completed in 2004. Since then various indicators have been used to monitor stock status. The lack of a recent full stock assessment means that it is not possible to determine that the stock is above the PRI with high certainty, so SG100 is not met.

1.1.1.b Stock status in relation to achievement of Maximum Sustainable Yield (MSY).		
60 Guidepost	80 Guidepost	100 Guidepost
	The stock is at or fluctuating around a level consistent with MSY.	There is a **high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.

Eastern Pacific Bigeye

Although a target reference point has not been formally defined, an MSY target is implied by the IATTC Convention. Additionally the scientific advice is structured around estimates relative to MSY.

The 2014 assessment indicates recent fishing mortality rates are estimated to be slightly below the level corresponding to MSY (about 5% less), but 2014 levels of spawning biomass are estimated to be around 95% B_{MSY} for the base case model. However, as previously noted, it is not clear that B_{MSY} is consistent with MSC definitions, and in the base case no stock recruitment relationship is assumed (i.e. h=1.0), which is not precautionary. For the more precautionary sensitivity analysis, the stock is determined to be 71% B_{MSY}, which is below the target level.

At current levels of fishing mortality, and if recent levels of effort and catchability continue and average recruitment levels persist, the spawning stock is predicted to remain stable at about 19%B_0 until 2017, and thereafter is predicted to gradually increase and stabilize at about 21%B_0 by 2019 slightly above the base case B_{MSY} (20%B_0), but below the more precautionary B_{MSY} (30%B_0). Thus, there is a significant chance that the stock is below the MSY reference point, so SG80 is not met.

Eastern Pacific Yellowfin

Although a target reference point has not been formally defined, an MSY target is implied by the IATTC Convention. Additionally the scientific advice is structured around estimates relative to MSY.

The recent fishing mortality rates on EPO yellowfin are lower than those corresponding to the MSY (F is approximately 83% of F_{MSY}). The spawning biomass has recently been determined to be around the level corresponding to MSY: B_{2013}=26%B_0 and B_{MSY}=27%B_0. Thus, the stock is not considered overfished and not undergoing overfishing, meeting SG80. A period of overfishing has occurred (relative to F_{MSY}), but was relatively short in duration (approximately five years in the mid-2000s). However, the stock cannot be considered to be fluctuating around its target reference point over recent years with a high degree of certainty, because sensitivity analyses suggest higher exploitation and lower biomass levels are a reasonable possibility. So, SG100 is not met.

Eastern Pacific Skipjack

Although a target reference point has not been formally defined, an MSY target is implied by the IATTC Convention. Additionally the scientific advice is structured around estimates relative to MSY.

A maximum sustainable reference point has not been defined due to the lack of a credible stock-recruitment relationship. As the stock assessments and reference point for skipjack are uncertain, alternative methods were used to assess the stock in 2012 in addition to the indicators that were previously used to assess the stock in 2004. Stock indicators have been maintained into 2014.

The main concern with the skipjack stock was the constantly increasing exploitation rate, but this has levelled off in recent years, and the indicators do not indicate any adverse consequence of exploitation rates so far. The average weight was below its lower reference level in 2009, which could be a consequence of overexploitation, but could also be caused by recent recruitments being greater than past recruitments or changes in selectivity. The tagging analysis for regions with good data and an alternative SEAPODYM model do not indicate a significant risk to the stock.

However, any continued decline in average length is a concern and, combined with levelling off of catch and CPUE, may indicate that the exploitation rate is approaching, or above, the level associated with MSY. Given the uncertainties with the available analyses, and at least one out of 8 indicators could indicate the stock is below the MSY level, the SG80 but not the SG100, is met.

Scoring for 1.1.1

Eastern Pacific Bigeye: All SG60 and SG80, but no SG100, are met. 80

Eastern Pacific Yellowfin: All SG60 and SG80, but no SG100, are met. 80

Eastern Pacific Skipjack: All SG60 and SG80, but no SG100, are met. 80

References

Aires-da-Silva, A. Maunder, M.N. 2014. Status of Bigeye Tuna in the Eastern Pacific Ocean in 2013 and Outlook for the Future. Inter-American Tropical Tuna Commission Scientific Advisory Committee Fifth Meeting. La Jolla, California (USA). 12-16 May 2014. SAC-05-08a.

Maunder, M. 2012. Status of Skipjack Tuna in the Eastern Pacific Ocean in 2011. Scientific Advisory Committee 3, Document 7a.

Maunder, M. 2014. Updated Indicators of Stock Status for Skipjack Tuna in the Eastern Pacific Ocean. Inter-American Tropical Tuna Commission Scientific Advisory Committee Fifth Meeting. La Jolla, California (USA). 12-16 May 2014. SAC-05-09a.

Minte-Vera, C.V., Aires-da-Silva, A. Maunder, M.N. 2014. Status of Yellowfin Tuna in the Eastern Pacific Ocean in 2013 and Outlook for the Future. Inter-American Tropical Tuna Commission Scientific Advisory Committee Fifth Meeting. La Jolla, California (USA). 12-16 May 2014. SAC-05-07.

1.1.2 Stock Rebuilding: Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe.

Scoring for 1.1.2

References

1.2 Harvest Strategy (Management)

1.2.1 Harvest Strategy: There is a robust and precautionary harvest strategy in place.

1.2.1.a Harvest strategy design		
60 Guidepost	80 Guidepost	100 Guidepost
The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.

Eastern Pacific Bigeye

The harvest strategy objective is to maintain stocks at a level that can support MSY. The status of the stock relative to MSY is monitored by the scientific staff of IATTC and is reported to the Commission. The Commission then can respond to the scientific information by developing resolutions for management actions to be implemented by the member states. While formal targets and limits have not been adopted by the IATTC, the MSY criterion is effectively used as the target.

Bigeye tuna are distributed across the Pacific Ocean, but the bulk of the catch is made closer to the eastern and western shelf areas. Bigeye are not often caught by purse seiners in the EPO north of 10ºN, but a substantial portion of the longline catches of bigeye in the EPO is made north of that parallel. Bigeye tuna do not generally move long distances relative to other tunas and current information indicates minimal net movement between the EPO and the western and central Pacific Ocean.

The assessment and management is conducted as if there were a single stock in the EPO. Analyses have shown that the results are insensitive to the spatial structure of the analysis and harvest strategies of Pacific-wide bigeye stocks are consistent.

The harvest strategy is responsive through the feedback advice to the Commission with which the Commission develops appropriate management actions. For example, conservation measures were implemented for EPO bigeye after SSB had fallen below B_{MSY}. The Commission maintains a resolution (C-13-01-Tuna-conservation-2014-2016), which limits fishing for larger vessels, including a 62 days no fishing per year for purse seines (mitigated by allowing a 30 day trip if there is an observer on board) and annual bigeye catch limits for longline. The resolution includes, among other things, research programs (e.g. into fish-aggregating devices and sorting grids) with a view to developing appropriate management controls. Additionally, a 1 month closed fishing area was established. However, it is the link between these actions and the expected outcomes in curtail mortality for example, remain unclear. Nevertheless, this is a harvest strategy that has responded to the state of the stock, meeting SG80. However, it is not designed to achieve MSY or a more precautionary exploitation level, so SG100 is not met.

Eastern Pacific Yellowfin

The harvest strategy objective is to maintain stocks at a level that can support MSY. The status of the stock relative to MSY is monitored by the scientific staff of IATTC and is reported to the Commission. The Commission then can respond to the scientific information by developing resolutions for management actions to be implemented by the member states. While formal targets and limits have not been adopted by the IATTC, the MSY criterion is effectively used as the target.

The harvest strategy is responsive through the feedback advice to the Commission with which the Commission develops appropriate management actions. For example, evidence indicates that after EPO yellowfin fishing mortality exceeded the MSY, it was successfully reduced to current levels below F_{MSY}. The Commission maintains a resolution (C-13-01-Tuna-conservation-2014-2016), which limits fishing for larger vessels, including a 62 days no fishing per year for purse seines (mitigated by allowing a 30 day trip if there is an observer on board) and annual bigeye catch limits for longline which will indirectly limit catches on yellowfin. Additionally, a 1 month closed fishing area was established.

However, it is unclear the linkage of these actions with assessment results and the expected outcomes of the management actions to curtail mortality. Many controls are primarily directed at

bigeye tuna. Nevertheless, this is a harvest strategy response to the state of the stock, meeting SG80, but is clearly not designed for yellowfin, so SG100 is not met.

Eastern Pacific Skipjack

The harvest strategy objective is to maintain stocks at a level that can support MSY. The status of the stock relative to MSY is monitored by the scientific staff of IATTC and is reported to the Commission. The Commission then can respond to the scientific information by developing resolutions for management actions to be implemented by the member states. While formal targets and limits have not been adopted by the IATTC, the MSY criterion is effectively used as the target.

EPO skipjack relies on surrogate indicators rather than direct estimates of MSY-related quantities. The harvest strategy is responsive through the feedback advice to the Commission with which the Commission develops appropriate management actions. For example current evidence indicates that EPO SKJ fluctuating around its surrogate reference level.

The Commission maintains a resolution (C-13-01-Tuna-conservation-2014-2016), which limits fishing for larger vessels, including a 62 days no fishing per year for purse seines (mitigated by allowing a 30 day trip if there is an observer on board) and annual bigeye catch limits for longline. Additionally, a 1 month closed fishing area was established. The impetus of these measures is more related to bigeye and yellowfin, but they should have some impact on skipjack although they have not been designed to do so. It is unclear the linkage of these actions with assessment results and the expected outcomes of the management actions to curtail mortality. Therefore, the harvest strategy responds to the state of the stock meeting SG80, but not SG100.

1.2.1.b Harvest strategy evaluation		
60 Guidepost	80 Guidepost	100 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.

Eastern Pacific Bigeye

The harvest strategy is not well-defined and has not been evaluated. But there is evidence that the stock is capable of meeting the MSY objectives. The results of the stock assessment indicate some recovery, subsequent to IATTC tuna conservation resolutions initiated in 2004, but sustained by some good recruitment. The stock has since declined to around the MSY level. There has been an evaluation of the management measures suggesting they are effective. However, the strategy is not fully evaluated as being clearly able to maintain stocks at target levels, with the stock expected to increase slightly in the medium term. This meets SG80, but not SG100.

Eastern Pacific Yellowfin

The harvest strategy is not well-defined and has not been evaluated. There is evidence that the period of overfishing has ended and the stock has recovered. However, the strategy is not fully evaluated as being clearly able to maintain stocks at target levels, meeting SG80, but not SG100.

Eastern Pacific Skipjack

The harvest strategy is not well-defined and has not been evaluated. There is evidence that the stock is capable of meeting the MSY objectives as evidenced by the history of surrogate status indicators. However, the strategy is not fully evaluated as being clearly able to maintain stocks at target levels. This meets SG80, but not SG100.

1.2.1.c Harvest strategy monitoring		
60 Guidepost	80 Guidepost	100 Guidepost
Monitoring is in place that is expected to determine whether the harvest strategy is working.		

Eastern Pacific Bigeye

The harvest strategy is well monitored both in terms of the status of the stock and the catches and fishing mortality rates affecting status. Data are collected to estimate management quantities. Also the stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not, meeting SG60.

Eastern Pacific Yellowfin

The harvest strategy is monitored both in terms of the status of the stock and the catches and fishing mortality rates affecting status. Data are collected to estimate management quantities. Also the stock assessment reports best estimates of biomass, which indicates whether management is achieving its objectives or not, meeting SG60.

Eastern Pacific Skipjack

Monitoring is adequate to determine whether the harvest strategy is working. The strategy consists of limiting catches at around 2005 level or lower. Data are collected to estimate these quantities. Also the stock assessment reports best estimates of biomass and indicators are monitored annually, indicating broadly whether management is achieving its objectives or not, meeting SG60.

1.2.1.d Harvest strategy review		
60 Guidepost	80 Guidepost	100 Guidepost
		The harvest strategy is periodically reviewed and improved as necessary.

Eastern Pacific Bigeye

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, so SG100 is not met.

Eastern Pacific Yellowfin

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, so SG100 is not met.

Eastern Pacific Skipjack

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, so SG100 is not met.

Scoring for 1.2.1

Eastern Pacific Bigeye: All SG60 and SG80, but no SG100, are met. 80

Eastern Pacific Yellowfin: All SG60 and SG80, but no SG100, are met. 80

Eastern Pacific Skipjack: All SG60 and SG80, but no SG100, are met. 80

References

Aires-da-Silva, A. Maunder, M.N. 2014. Status of Bigeye Tuna in the Eastern Pacific Ocean in 2013 and Outlook for the Future. Inter-American Tropical Tuna Commission Scientific Advisory Committee Fifth Meeting. La Jolla, California (USA). 12-16 May 2014. SAC-05-08a

IATTC 2013. Multiannual Program for the Conservation of Tuna in the Eastern Pacific Ocean during 2014-2016. Inter-American Tropical Tuna Commission 85th Meeting. Veracruz, Veracruz (Mexico). 10-14 June 2013. Resolution C-13-01

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Minte-Vera, C.V., Aires-da-Silva, A. Maunder, M.N. 2014. Status of Yellowfin Tuna in the Eastern Pacific Ocean in 2013 and Outlook for the Future. Inter-American Tropical Tuna Commission Scientific Advisory Committee Fifth Meeting. La Jolla, California (USA). 12-16 May 2014. SAC-05-07.

1.2.2 Harvest control rules and tools: There are well defined and effective harvest control rules (HCRs) in place.

1.2.2.a HCRs design and application		
60 Guidepost	80 Guidepost	100 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** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.

Eastern Pacific Bigeye

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. There is clear evidence of intention to reduce effort and limit catches in the face of depletion as indicated by C-13-01 (Tuna Conservation 2014-2016), but these actions are not linked directly to outcomes in terms of either status or fishing mortality rates. The scope of actions which might be taken in the future is not well-defined. It is presumed that appropriate action would be taken if the stock came under increased pressure, but this is not assured. This meets SG60, but not SG80.

Eastern Pacific Yellowfin

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. There is clear evidence of intention to reduce effort and limit catches in the face of depletion as indicated by C-13-01 (Tuna Conservation 2014-2016), but these actions are not linked directly to outcomes in terms of either status or fishing mortality rates. The scope of actions which might be taken in the future is not well-defined. It is presumed that appropriate action would be taken if the stock came under increased pressure, but this is not assured. This meets SG60, but not SG80.

Eastern Pacific Skipjack

There is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level. There is clear evidence of intention to reduce effort and limit catches in the face of depletion as indicated by C-13-01 (Tuna Conservation 2014-2016), but these actions are not linked directly to outcomes in terms of either status or fishing mortality rates. The scope of actions which might be taken in the future is not well-defined. It is presumed that appropriate action would be taken if the stock came under increased pressure, but this is not assured. This meets SG60, but not SG80.

1.2.2.b HCRs robustness to uncertainty		
60 Guidepost	80 Guidepost	100 Guidepost
	The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.

Eastern Pacific Bigeye

It is not possible to evaluate the harvest control rule in relation to uncertainties, because it has not been defined well enough to do so. This does not meet SG80.

Eastern Pacific Yellowfin

It is not possible to evaluate the harvest control in relation to uncertainties, because it has not been defined well enough to do so. This does not meet SG80.

Eastern Pacific Skipjack

It is not possible to evaluate the harvest control in relation to uncertainties, because it has not been defined well enough to do so. This does not meet SG80.

1.2.2.c HCRs evaluation		
60 Guidepost	80 Guidepost	100 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 HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.

Eastern Pacific Bigeye

The current level of control, mainly through limits on effort or catches of larger vessels, is expected to limit EPO bigeye at or below current fishing mortality rates. Evidence for the effectiveness of these controls is indicated by stock projections over 5 years at current fishing mortality rates. There has been an evaluation of the management measures suggesting they are effective. Controls which might be needed in the future have not been evaluated for effectiveness and the ability of contracting parties to apply these controls is uncertain. More evidence might be obtained by more clearly linking management measures to values in the stock assessment projections, for example. This meets SG60, but with limited evidence available, not SG80.

Eastern Pacific Yellowfin

The current level of control, mainly through limits on fishing effort of larger vessels are expected to limit EPO yellowfin at or below current fishing mortality rates. There is some evidence for the effectiveness of these controls is from past reductions in fishing mortality. There is stated intention to reduce mortality on smaller yellowfin and bigeye, which has not been achieved yet. The fishing mortality is constrained by controls intended to limit fishing mortality on bigeye tuna, as well. Evidence is therefore limited as to controls which might be needed in the future, and the ability of contracting parties to apply these controls. This clearly meets SG60, but there is no strong evidence that current tools are sufficient to implement a sustainable harvest control rule.

Eastern Pacific Skipjack

The current level of control is mainly passive without direct measure affecting skipjack. The broader tuna conservation measures (C-13-01) are mainly directed at larger vessels and expected to indirectly impact skipjack. There is some evidence through historical indicators that the current passive control has been effective. But controls which might be needed in the future have not been evaluated for effectiveness and the ability of contracting parties to apply these controls. At best, this meets only SG60, not SG80.

Scoring for 1.2.2

Eastern Pacific Bigeye: All SG60, but no SG80, are met. 60

Eastern Pacific Yellowfin: All SG60, but no SG80, are met. 60

Eastern Pacific Skipjack: All SG60, but no SG80, are met. 60

References

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Minte-Vera, C.V., Aires-da-Silva, A. Maunder, M.N. 2014. Status of Yellowfin Tuna in the Eastern Pacific Ocean in 2013 and Outlook for the Future. Inter-American Tropical Tuna Commission Scientific Advisory Committee Fifth Meeting. La Jolla, California (USA). 12-16 May 2014. SAC-05-07.

1.2.3 Information / monitoring: Relevant information is collected to support the harvest strategy.

1.2.3.a Range of information		
60 Guidepost	80 Guidepost	100 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 are available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available.

Eastern Pacific Bigeye

Sufficient information (on stock structure, stock productivity, fleet composition), is available to monitor and assess stock status including reporting and size-frequency sampling by each fleet and catch-per-unit-effort data from these fleets. There is a long history of biological and environmental research on EPO bigeye, and considerable environmental information that is not explicitly used in

the harvest strategy. These data are sufficient to monitor status and to monitor catches and mortality rates to support a harvest strategy, meeting SG80. However, available data falls short of being comprehensive with gaps in the information for some fleets. Overall, this meets the SG80, but not SG100.

Eastern Pacific Yellowfin

Sufficient information (on stock structure, stock productivity, fleet composition), is available to monitor and assess stock status including reporting and size-frequency sampling by each fleet and catch-per-unit-effort data from these fleets.

Yellowfin tuna are distributed across the Pacific Ocean. Movement of tagged yellowfin tuna is generally limited to hundreds of kilometres in most cases and exchange between the EPO and the WCPO appears to be limited, and limited genetic information suggests more limited movement. The current stock designation is sufficient, even if improvements are possible.

Biology and life history is relatively well understood and sufficient for stock assessment. Fleet compositions are well monitored. There is considerable environmental data, which is not directly used in the harvest strategy. Some key information on stock productivity is not well-estimated, notably on growth and natural mortality, although some improvements in these estimates have taken place. Overall these data are sufficient for stock assessments to monitor status and mortality rates to support a harvest strategy, meeting SG80. However, information may not be comprehensive enough to meet SG100.

Eastern Pacific Skipjack

Sufficient information (on stock structure, stock productivity, fleet composition), is available to monitor and status through a suite of indicators, covering stock abundance and exploitation, which are regularly monitored at a level of accuracy and coverage consistent with the harvest strategy. Skipjack biology is reasonably well-understood, and there is considerable environmental data which is not directly used in the harvest strategy. Recruitment cannot be well-estimated, but is an important driver for stock size in this short-lived tuna species. There is some tagging and other data for the evaluation of stock structure.

These data are sufficient for to monitor status and mortality rates to support the harvest strategy. However, the data are limited relative to direct estimates of stock productivity or determine accurate MSY reference points. For a precautionary harvest strategy, this meets SG80, but not SG100.

1.2.3.b Monitoring		
60 Guidepost	80 Guidepost	100 Guidepost
Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.

Eastern Pacific Bigeye

Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with best-practice harvest control rules. In addition there is observer coverage which provides data for discard estimates. However, data from some fleets are incomplete, but in general there is good information on fishery removals from the stock.

Substantial amounts of information are collected for the stock assessment, including data on retained catches, discards, indices of abundance (CPUE), and the size compositions of the catches of the various fisheries. However, sampling and reporting of the catch and effort statistics from some fleets is limited and thus there is not a high degree of certainty about all information needed for a HCR. This meets SG80, but not SG100.

Eastern Pacific Yellowfin

Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with likely and best practice HCRs, and indicators of catch and effort are available and monitored with sufficient frequency to support catch or effort-related HCRs. In addition there is observer coverage which provides data for discard estimates. However, data from some fleets are incomplete. In general, there is good information on fishery removals from the stock.

Substantial amounts of information are collected, including data on retained catches, discards, indices of abundance (CPUE), and the size compositions of the catches of the various fisheries which are sufficient for any appropriate HCR. However, sampling and reporting of the catch and effort statistics from some fleets is limited and thus there is not a high degree of certainty about all information needed for the HCR. This meets SG80, but not SG100.

Eastern Pacific Skipjack

Substantial amounts of information are collected, including data on retained catches, discards, indices of abundance (CPUE), and the size compositions of the catches of the various fisheries. These have been used to define stock status indicators which are used to provide management advice. However, sampling and reporting of the catch and effort statistics from some fleets is limited and

thus there is not a high degree of certainty about all information needed for an HCR. This meets SG80, but not SG100.

1.2.3.c Comprehensiveness of information		
60 Guidepost	80 Guidepost	100 Guidepost
	There is good information on all other fishery removals from the stock.	

Eastern Pacific Bigeye

Catches are reasonably well monitored and are sufficient for stock assessment. There has been an IATTC observer program since 1993 for larger vessels, and the United States has had an observer program from the 1970s. Observer coverage has allowed discards of tuna to be estimated, as well as estimates of bycatch of other species. The level of monitoring is sufficient for the harvest strategy, and therefore meets SG80.

Eastern Pacific Yellowfin

Catches are reasonably well monitored and are sufficient for stock assessment. There has been an IATTC observer program since 1993 for larger vessels, and the United States has had an observer program from the 1970s. Observer coverage has allowed discards of tuna to be estimated, as well as estimates of bycatch of other species. The level of monitoring is sufficient for the harvest strategy, and therefore meets SG80.

Eastern Pacific Skipjack

Catches are reasonably well monitored and are sufficient for stock assessment. There has been an IATTC observer program since 1993 for larger vessels, and the United States has had an observer program from the 1970s. Observer coverage has allowed discards of tuna to be estimated, as well as estimates of bycatch of other species. The level of monitoring is sufficient for the harvest strategy, and therefore meets SG80.

Scoring for 1.2.3

Eastern Pacific Bigeye: All SG60 and SG80, but no SG100, are met. 80

Eastern Pacific Yellowfin: All SG60 and SG80, but no SG100, are met. 80

Eastern Pacific Skipjack: All SG60 and SG80, but no SG100, are met. 80

References

Aires-da-Silva, A. Maunder, M.N. 2014. Status of Bigeye Tuna in the Eastern Pacific Ocean in 2013 and Outlook for the Future. Inter-American Tropical Tuna Commission Scientific Advisory Committee Fifth Meeting. La Jolla, California (USA). 12-16 May 2014. SAC-05-08a

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Maunder, M.N. and Harley, S.J. 2005. Status of skipjack tuna in the eastern Pacific Ocean in 2003 and outlook for 2004. Inter-Amer. Trop. Tuna Comm., Stock Assessment Report, 5: 109-167.

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1.2.4 Assessment of stock status: There is an adequate assessment of the stock status.

1.2.4.a Appropriateness of assessment to stock under consideration		
60 Guidepost	80 Guidepost	100 Guidepost
	The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.

Eastern Pacific Bigeye

Recent EPO BET assessments have used an integrated statistical age-structured stock assessment model (Stock Synthesis v3) to assess the tuna stock. The status of the stock of bigeye in the EPO results in estimates of spawning biomass, yield per recruit, MSY and other parameters.

This model is the same as that used in the previous full assessment conducted in 2013, which included several improvements, including significant improvements in the growth model and weighting among different data sources and rejection of some of the CPUE series not thought to represent abundance. The assessment is able to make use of all available data.

The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points, taking into account the main features of the biology and distribution bigeye. This meets SG100.

Eastern Pacific Yellowfin

An integrated statistical age-structured stock assessment model (Stock Synthesis Version 3.23b) was used in the assessment. The stock assessment requires substantial amounts of information, including data on retained catches, discards, indices of abundance (CPUE), and the size compositions of the catches of the various fisheries. Assumptions have been made about processes such as growth, recruitment, movement, natural mortality and stock structure. Various data were updated

for the new assessment in 2013, but the approach remains very similar to previous assessments. The assessment is able to use all available data and was well-adapted to take account of yellowfin biology.

The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points, taking into account the biology and distribution of yellowfin. This meets SG100.

Eastern Pacific Skipjack

The last full assessment of EPO skipjack was done in 2004 using an age-structured catch-at-length analysis (A-SCALA). It was generally believed this modelling approach provided unrealistic estimates for biomass and fishing mortality, so a simpler approach has been used since then. This consists of data- and simple model-based indicators, which have been used to monitor the status of the stock. The major features of the biology and distribution of the fishery and population were accounted for in the assessment model, but more recent assessments have depended on a simpler indicator based approach.

Eight data- and model-based indicators have been used to evaluate relative status since the last full assessment. These were updated and reported in 2014. Given the likely exploitation level and risk for this stock, this is appropriate and allows the implementation of harvest control rules, meeting SG80. However, it is not clear that the current method to monitor stock status is taking into account major features of the fishery, so SG100 is not met.

1.2.4.b Assessment approach		
60 Guidepost	80 Guidepost	100 Guidepost
The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	

Eastern Pacific Bigeye

The stock assessment has been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

Eastern Pacific Yellowfin

The stock assessment has been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

Eastern Pacific Skipjack

The primary monitoring method is now based on relative changes in 8 indicators. These have reference levels based on the 5th and 95th percentiles of historical values. Together these are used as proxy indicators of stock trends over time. The trends date back to the 1970s and suggest the stock status is stable. A number of indicators suggest improving status, although average weight has declined. Full stock assessment was conducted in 2012, but has been rejected as did not provide a reliable assessment. Although generic historical reference points are used, there is no formal link to MSY or an MSY proxy, which is required by the MSC standard. This meets SG60, but not SG80.

1.2.4.c Uncertainty in the assessment		
60 Guidepost	80 Guidepost	100 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.

Eastern Pacific Bigeye

The assessment reports trends and projections of quantities with confidence intervals. Therefore, estimation uncertainty is being evaluated. Additionally, model uncertainty is being evaluated through alternative hypotheses about productivity through the stock recruitment relationship and by testing sensitivity of parameters. This has been done as the stock assessment has developed and improved. Especially sensitive are the assumptions made about the “steepness” parameter of the stock recruitment relationship, and the historic period of the bigeye exploitation used in the assessment. All of these alternative assumptions and others have tested in assessments.

However, probabilistic statements of status are not given in summary reports and are not explicitly used in decision-making. These can be computed, but they are not part of the current format for scientific advice (Fishery Status Reports). This meets SG80, but not SG100.

Eastern Pacific Yellowfin

The assessment reports trends and projections of quantities with confidence intervals. Therefore, estimation uncertainty is being evaluated. Additionally, model uncertainty has been evaluated through alternative hypotheses about productivity through the stock recruitment relationship and by testing sensitivity of parameters (steepness, mortality rates). However, probabilistic statements of status are not given in summary reports. These could be computed, but they are not part of the current format for scientific advice (Fishery Status Reports), so the uncertainty is not well reported. This meets SG80, but not SG100.

Eastern Pacific Skipjack

The assessment reports trends with confidence intervals. Therefore, estimation uncertainty is being evaluated. Additionally, model uncertainty is being evaluated through alternative hypotheses about productivity through the stock recruitment relationship and by testing sensitivity of parameters. Sensitive assumptions are noted and tested. However a full assessment has not been conducted since 2004. Therefore, status determinations have been relying solely on the indicators. The infrequent full assessment is an additional source of uncertainty.

Probabilistic statements of status are not given in summary reports. It is unlikely they can be computed given the current data situation. This meets SG80, but not SG100.

1.2.4.d Evaluation of assessment		
60 Guidepost	80 Guidepost	100 Guidepost
		The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.

Eastern Pacific Bigeye

The software (SS3) which has been applied has been tested on many stocks worldwide. Additionally, SS3 provides considerable flexibility in modifying model structure based on diagnostics such as degree of fit to key data sources (catch at size, indices of abundance, etc.). Exploratory analyses during the original assessment with this software established appropriate spatial and fishery strata. In past assessments the robustness of scientific advice is evaluated through alternative hypotheses about productivity through the stock recruitment relationship and by testing sensitivity of parameters (steepness, mortality rates). With some issues having been resolved, the sensitivities for the most recent assessment were limited to one, making it difficult to claim that alternative hypotheses have been rigorously explored, failing SG100.

Eastern Pacific Yellowfin

The software (SS3) which has been applied has been tested on many stocks worldwide. Additionally, SS3 provides considerable flexibility in modifying model structure based on diagnostics such as degree of fit to key data sources (catch at size, indices of abundance, etc.). Exploratory analyses during the original assessment with this software established appropriate spatial and fishery strata.

In the current assessment the robustness of scientific advice is evaluated through alternative hypotheses about productivity through the stock recruitment relationship and by testing sensitivity of parameters (steepness, mortality rates). However, reported sensitivity and uncertainty was very limited, so the robustness of results and full exploration of approaches was not clearly demonstrated, so SG100 is not met.

Eastern Pacific Skipjack

The assessment has been not been tested and shown to be robust. Many alternative hypotheses exist without formal evaluation. It has been suggested that this stock assessment (and management) would benefit from a full Management Strategy Evaluation which would help to rigorously explore assessment approaches and couple them with management evaluation in the context of harvest control rules. This does not meet SG100.

1.2.4.e Peer review of assessment		
60 Guidepost	80 Guidepost	100 Guidepost
	The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.

Eastern Pacific Bigeye

The stock assessment is subject to review through internal review processes and periodic external review processes. Model structure, data and research are examined for each assessment, the last published external review being from 2010. Although there has been no recent review published, the model is similar with improvements based on recommendations, meeting SG100.

Eastern Pacific Yellowfin

The stock assessment is subject to review through internal review processes and periodic external review processes. The last external review of its assessment of yellowfin tuna was held in October 2012. Model structure, data and research are examined for each assessment, and there has been a response to recommendations. This meets SG100.

Eastern Pacific Skipjack

The stock assessment is subject to review through internal review processes where model structure, data and research are examined for the assessment. The review process has led to rejection of the previous assessment. There is no evidence of external peer review for this stock assessment, or whether the indicators are sufficient for the harvest strategy. This only meets SG80.

Scoring for 1.2.4

Eastern Pacific Bigeye: All SG60 and SG80 are met, and 2 out of 4 SG100 are met. 90

Eastern Pacific Yellowfin: All SG60 and SG80 are met, and 2 out of 4 SG100 are met. 90

Eastern Pacific Skipjack: All SG60 and SG80, but no SG100, are met. 80

References

Aires-da-Silva, A. Maunder, M.N. 2014. Status of Bigeye Tuna in the Eastern Pacific Ocean in 2013 and Outlook for the Future. Inter-American Tropical Tuna Commission Scientific Advisory Committee Fifth Meeting. La Jolla, California (USA). 12-16 May 2014. SAC-05-08a

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Sibert, J.R., Harley, S.J., Ianelli, J.N. Punt, A.E. 2012. External Review of IATTC Bigeye Tuna Assessment. 3-7 May 2010, La Jolla, California. IATTC Special Report 19.

IATTC/WCPFC Joint Stocks

1.1 Outcome

1.1.1 Stock Status: The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.

1.1.1.a Stock status relative to recruitment impairment.		
60 Guidepost	80 Guidepost	100 Guidepost
It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.

North Pacific Albacore

Estimates from the 2014 stock assessment of total stock biomass (age-1 and older) and female spawning biomass (SSB) show a long term decline from the early 1970s to 1990 followed by a recovery through the 1990s and subsequent fluctuations without trend in the 2000s. SSB was estimated the terminal year of the assessment (2012) and stock depletion is estimated to be 35.8% of unexploited SSB.

The International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) believed that north Pacific albacore recruitment is influenced by changes in environmental conditions and the stock-recruitment relationship. There are apparent trends in recruitment, but these may not be easily linked to stock size. No limit reference point has been adopted and analytical MSY estimates appear low compared to MSC default values. Therefore, an analogous value of $F_{20\%}$ is used as an approximate PRI here, which gives a median biomass around 54000t. This is well below the 2012 SSB estimate of approximately 110101t, with 2012 fishing mortality also below the $F_{20\%}$. The scientific working group also stated that the stock is likely to be above any candidate reference points. Therefore, it appears highly likely that the stock is above its PRI, meeting SG80.

However, it is not possible to state that the stock is above the PRI with a high degree of certainty. Confidence limits or ranges are not given (although graphs suggest these are wide), and reference points have not been tested for this to be the case, so SG100 is not met.

South Pacific Albacore

The most recent 2012 assessment determined that overfishing is not occurring and the stock is not in an overfished state. Estimates of average $B_{2007\text{-}2010}/B_{MSY}$ vary between model configurations, but all indicate that the stock is well above the MSY reference point. No limit reference point has been defined. The default stock-recruitment "steepness" parameter will affect the PRI and MSY reference points and cannot be estimated. Spawning stock biomass is reported as around 60% (90% credibility interval 37%-72%) of the unexploited state which is well above any candidate PRI. Therefore the SG100 is met.

1.1.1.b Stock status in relation to achievement of Maximum Sustainable Yield (MSY).		
60 Guidepost	80 Guidepost	100 Guidepost
	The stock is at or fluctuating around a level consistent with MSY.	There is a **high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.

North Pacific Albacore

The stock is expected to fluctuate around the long-term median SSB in the foreseeable future given average historical recruitment levels and constant fishing mortality at $F_{2010\text{-}2012}$. Current $F_{2010\text{-}2012}$ is about 72% of $F_{SSB\text{-}ATHL}$. $F_{SSB\text{-}ATHL}$ is defined as the fishing mortality that will maintain SSB above the average of the ten historically lowest estimated SSB levels with a probability of 50% during a 25-yr projection period, so fishing mortality below this level might be considered precautionary. SSB in 2012 was also estimated as above the median SSB expected with $F_{SSB\text{-}ATHL}$.

No target reference point has been selected. SSB at MSY was estimated to be around 50000t, which is at the lower end of reference points reviewed and close to $F_{20\%}$ used as a PRI above. The stock was estimated to be well above this point in 2012. It is unclear what would be an appropriate target in this stock consistent with a precautionary definition of MSY. The scientific working group conclude that there is little evidence that fishing has reduced SSB below reasonable candidate biomass-based reference points.

Given the relative good status of the stock, it seems likely it has been at or above any candidate MSY reference point, attaining SG80. However, the lack of a clear target shown to be consistent with MSY and given the uncertainties with the stock assessment, this cannot be determined with a high degree of certainty, so SG100 is not met.

South Pacific Albacore

The median fishing mortality reference point F_{2011}/F_{MSY} was estimated as 0.21 (90% CI 0.04-1.08), so there is low risk that overfishing is occurring. The corresponding biomass-based reference points $B_{2007-2010}/B_{MSY}$ was estimated to be well above 1.0 (median 2.6, 90% CI 1.5-5.2), and therefore the stock was not in an overfished state. The median estimate of MSY from the structural sensitivity analysis (99085 t, 46560 – 215445) was comparable to the recent levels of (estimated) catch from the fishery (average 2007-2010 78664 t, and in 2011 89790 t). Longline catch rates are declining, and catches over the last 10 years have been at historically high levels and are increasing. These estimates of stock status and trends are similar to the previous assessments of 2009 and 2011.

However, it is worth noting that the MSY reference point is relatively low for this stock (B_{MSY}/B_0=0.23 90% CI 0.12-0.30), probably as a result of selectivity estimates. Precautionary "steepnesss" values of 0.65 are included in the sensitivity analyses. Such low MSY reference point values are more dependent model structural assumptions and are not necessarily precautionary target reference points.

Nevertheless, the average stock status 2007-2010 estimated relative to the unexploited state was 59% (90% CI 41%-76%). Therefore, the current stock status is high and well above any precautionary MSY biomass reference point, so the SG100 is met.

Scoring for 1.1.1

North Pacific Albacore: All SG60 and SG80, but no SG100, are met. 80

South Pacific Albacore: All SG60, SG80 and SG100 are met. 100

References

Hoyle, S., Hampton, J. Davies, N. 2012. Stock Assessment of Albacore Tuna in the South Pacific Ocean. Scientific Committee Eighth Regular Session. Busan, Republic of Korea. 7-15 August 2012. WCPFC-SC8-2012/SA-WP-04-REV1.

ISC. 2014. Stock assessment of albacore in the North Pacific Ocean in 2014. Report of the Albacore Working Group Stock Assessment Workshop. International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean. 16 - 21 July 2014 Taipei, Taiwan. WCPFC-SC10-2014/SA-WP-12.

1.1.2 Stock Rebuilding: Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe.

Scoring for 1.1.2

References

1.2 Harvest Strategy (Management)

1.2.1 Harvest Strategy: There is a robust and precautionary harvest strategy in place.

1.2.1.a Harvest strategy design		
60 Guidepost	80 Guidepost	100 Guidepost
The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.

North Pacific Albacore

The harvest strategy for North Pacific albacore is that on the basis of scientific evidence, conservation and management measures will be employed to ensure the conservation of the stocks. Therefore, the harvest strategy is to maintain stock levels at or above the biomass which would produce MSY. However, the response of North Pacific albacore to oceanographic fluctuations has not allowed credible estimates of MSY to be made. Research on this has been recommended in the form of plausible priors on stock-recruitment "steepness" parameter, for which precautionary values have been tested.

Nevertheless, the observed biomass trends have been maintained above lower levels previously seen 1980s and 1990s. Therefore, the strategy has worked toward maintaining the stock, meeting SG80. However, much of the strategy is "implied" rather than clearly defined, and it is unclear whether the harvest strategy will be fully responsive. There is also a lack of evidence that it is in any way designed, failing SG100.

South Pacific Albacore

Management of the albacore stock throughout the South Pacific is a responsibility of the Western and Central Pacific Fisheries Commission (WCPFC). Stock assessments have been carried out on an annual basis, which is relatively frequent given the longevity of the species and current level of exploitation, and the assessment has shown significant changes as it has been developed and improved. The countries responsible submit data for inclusion in the stock assessment, and compliance with this data provision is good, although uncertainties remain due to a lack of additional information required to interpret the basic data. The results from the assessment are reported to the annual Scientific Committee meeting which makes subsequent recommendations to the Commission. This in turn leads to conservation measures, which may be evaluated if required. The scientific advice produced from recent assessments has remained broadly the same.

Countries undertake to control catches mainly through effort limits and limits on capacity (i.e. number of vessels targeting albacore). Attempts are being made to estimate biomass which could lead to a national quota system based on catch or effort, or similar procedures. However, the current system is a long way from this, and management is currently conducted through a relatively crude control. Given the state of the stock, this is currently adequate.

The current Conservation and Management Measure (this is a binding measure that all parties must abide by) adopted in 2010 states that Commission Members, Cooperating Non-Members, and participating Territories (CCMs) shall not increase the number of their fishing vessels actively fishing for South Pacific albacore in the Convention Area south of 20°S above 2000-2005 levels. However, the measure specifically allows Pacific Islands to pursue a responsible level of development of their domestic albacore fisheries. An external review of the management process has been undertaken, which found the WCPFC management system was sound, but with a number of shortcomings which the authors addressed through recommendations. SG80 is met.

1.2.1.b Harvest strategy evaluation		
60 Guidepost	80 Guidepost	100 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.

North Pacific Albacore

As noted above, the harvest strategy is likely to work based upon the prior history of the stock's dynamics. This provides evidence that the stock increased after a period of low recruitment with concomitant changes in fishing mortality. The meets SG80, but the strategy has not been fully evaluated and evidence that objectives will be met remains limited, so SG100 is not met.

South Pacific Albacore

Countries undertake to control catches mainly through effort limits and limits on capacity (i.e. number of vessels targeting albacore). Countries are required to monitor and report catches and fishing activities, and fishing activity targeting albacore appears to be well monitored. Given the state of the stock, currently evidence indicates controls are working and achieving conservation objectives. SG80 is met, but without fuller evaluation SG100 cannot be met.

1.2.1.c Harvest strategy monitoring		
60 Guidepost	80 Guidepost	100 Guidepost
Monitoring is in place that is expected to determine whether the harvest strategy is working.		

North Pacific Albacore

Monitoring is adequate to determine whether the harvest strategy is working, meeting SG60. Catch, CPUE and growth sampling have been adequate to support the assessment but there are limitations. The stock assessment reports estimates of biomass, which indicates whether management is achieving its objectives or not.

South Pacific Albacore

Monitoring is in place and stock assessments, review of status and public reports are being made to allow evaluation. This is adequate given the state of the stock, and meets SG60.

1.2.1.d Harvest strategy review		
60 Guidepost	80 Guidepost	100 Guidepost
		The harvest strategy is periodically reviewed and improved as necessary.

North Pacific Albacore

There has not been a formal review of the harvest strategy, although the Scientific Committee has initiated efforts to provide the scientific options for a harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible. There is stated intention to evaluate the current strategy as it progresses, but this falls short of a formal review, although it may still lead to improvements. Therefore, it does not meet SG100.

South Pacific Albacore

There has not been a formal review of the harvest strategy. Although the harvest strategy is reasonable, there is inadequate information available to indicate what improvements might be possible. There is stated intention to evaluate the current strategy as it progresses, but this falls short of a formal review, although it may still lead to improvements. Therefore, it does not meet SG100.

Scoring for 1.2.1

North Pacific Albacore: All SG60 and SG80, but no SG100, are met. 80

South Pacific Albacore: All SG60 and SG80, but no SG100, are met. 80

References

Hoyle, S., Hampton, J. Davies, N. 2012. Stock Assessment of Albacore Tuna in the South Pacific Ocean. Scientific Committee Eighth Regular Session. Busan, Republic of Korea. 7-15 August 2012. WCPFC-SC8-2012/SA-WP-04-REV1.

IATTC, 2005. Resolution on Northern Albacore Tuna. 73rd Meeting, Lanzarote (Spain), 20-24 June 2005. Resolution C-05-02

IATTC, 2013. Supplemental Resolution on North Pacific Albacore. 85th Meeting, Veracruz (Mexico). 10-14 June 2013, Resolution C-13-03

ISC. 2014. Stock assessment of albacore in the North Pacific Ocean in 2014. Report of the Albacore Working Group Stock Assessment Workshop. International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean. 16 - 21 July 2014 Taipei, Taiwan. WCPFC-SC10-2014/SA-WP-12.

WCPFC 2010. Conservation and Management Measure for South Pacific Albacore. Seventh Regular Session Honolulu, Hawaii, USA, 6-10 December 2010. CMM 2010-051

WCPFC, 2005. Conservation and Management Measure for North Pacific Albacore. CMM-2005-03.

1.2.2 Harvest control rules and tools: There are well defined and effective harvest control rules (HCRs) in place.

1.2.2.a HCRs design and application		
60 Guidepost	80 Guidepost	100 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** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.

North Pacific Albacore

There is no well-defined harvest control rule for North Pacific Albacore and therefore there is no specific plan of control if the stock size falls below a target trigger point represented by the median historical biomass. Nor is there an action specified if the biomass approaches the SSB-ATHL reference point. There is evidence of intention to reduce harvest should depletion occur. Currently, broad resolutions to limit increases in effort have been made within the RFMOs (e.g. WCPFC CMM-2005-03, IATTC Resolutions C-05-02 and C-13-03), but it is unclear how this is to be implemented. The scope of what those actions might be is not defined. The event that catches and effort would be reduced if the stock came under increased pressure is presumed, but not assured, meeting SG60, but not SG80.

South Pacific Albacore

The harvest control rule is generally understood as reducing harvest when the stock approaches or falls below the maximum sustainable yield level. However, the precise point when action will be

taken and exactly what action will be taken is not defined, but would be proposed by the Commission based on the advice of the Scientific Committee at the time. This would likely be similar to the advice currently given, which is based around controlling fishing effort and capacity. An example of this approach is provided for bigeye tuna which is more heavily exploited.

The scientific basis for decision making is well established and documented. The harvest control rules are currently based on B/B_{MSY} and F/F_{MSY} reference points. The overarching harvest control rule to maintain stocks at or above MSY has been established and codified by the Commissions. Thus, this harvest control rule is generally consistent with reference points from the assessment and the limitations of data that are inputs to the assessment, meeting SG60, but until the HCR is well-defined it cannot meet SG80.

1.2.2.b HCRs robustness to uncertainty		
60 Guidepost	80 Guidepost	100 Guidepost
	The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.

North Pacific Albacore

It is not possible to evaluate the harvest control in relation to uncertainties, because the HCR has not been defined well enough to do so. Therefore SG80 cannot be met.

South Pacific Albacore

No well-defined harvest control has been selected, so SG80 cannot be met. Note also, the MSY reference points are set at a low level for B/B_0, so evidence that the HCR is robust if based on these quantities would be required.

1.2.2.c HCRs evaluation		
60 Guidepost	80 Guidepost	100 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 HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.

North Pacific Albacore

A level of control to respond to excess fishing pressure has not been demonstrated partially because biomass is currently in a regime of higher recruitment relative to previous decades. The relevant RFMOs have adopted a limit on increases in fishing effort (WCPFC CCM-2005-03; IATTC C-05-02). This demonstrates some evidence of appropriate controls being applied that should meet objectives, at best meeting SG60. Nevertheless, there are as of yet no harvest control rules at the RFMO level and, thus, no clear evidence that the tools are effective, so SG80 is not met.

South Pacific Albacore

Tools, should they be needed, can be initiated through the IATTC and WCPFC. Currently, measures are in place in the Commissions to prevent increases of fishing effort on albacore, as defined by the Conservation and Management Measure WCPFC-CMM-2010-51. Comparable actions have been taken by IATTC and WCPFC for other species (such as yellowfin and bigeye tunas), and evidence exists that some control is being exerted over the exploitation of these stocks.

Recent albacore catch have been sustainable and the current advice is to maintain the harvest at that level appears to have been successful, although it is not clear that there is any pressure to increase catches. However, in the case of bigeye tuna, where fishing mortality is considered to be above the MSY level, fishing mortality is being reduced at best only slowly and the lack of a well-defined harvest control rule is apparent.

The harvest control is consistent with the aims of the harvest strategy standard and indicates that the exploitation rate will be reduced once the stock approaches B_{MSY}. However, the lack of a well-defined harvest control rule prevents assessment of how precautionary it is or whether current tools are adequate in applying the rule, so the performance indicator is unable to meet SG80.

Scoring for 1.2.2

North Pacific Albacore: All SG60, but no SG80, are met. 60

South Pacific Albacore: All SG60, but no SG80, are met. 60

References

Hoyle, S., Hampton, J. Davies, N. 2012. Stock Assessment of Albacore Tuna in the South Pacific Ocean. Scientific Committee Eighth Regular Session. Busan, Republic of Korea. 7-15 August 2012. WCPFC-SC8-2012/SA-WP-04-REV1.

IATTC, 2005. Resolution on Northern Albacore Tuna. 73rd Meeting, Lanzarote (Spain), 20-24 June 2005. Resolution C-05-02

IATTC, 2013. Supplemental Resolution on North Pacific Albacore. 85th Meeting, Veracruz (Mexico). 10-14 June 2013, Resolution C-13-03

ISC. 2014. Stock assessment of albacore in the North Pacific Ocean in 2014. Report of the Albacore Working Group Stock Assessment Workshop. International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean. 16 - 21 July 2014 Taipei, Taiwan. WCPFC-SC10-2014/SA-WP-12.

WCPFC 2010. Conservation and Management Measure for South Pacific Albacore. Seventh Regular Session Honolulu, Hawaii, USA, 6-10 December 2010. CMM 2010-051

WCPFC, 2005. Conservation and Management Measure for North Pacific Albacore. CMM-2005-03.

1.2.3 Information / monitoring: Relevant information is collected to support the harvest strategy.

1.2.3.a Range of information		
60 Guidepost	80 Guidepost	100 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 are available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available.

North Pacific Albacore

North Pacific albacore data are reasonably informative containing relevant information on the spatial distribution of catches, size frequencies, from numerous fleets, and alternative growth and mortality models. Tagging and genetic studies have been carried out, which support North Pacific as a separate stock, but more detailed spatial structure within the North Pacific is uncertain.

More than 50% of the albacore harvested in the North Pacific Ocean since 1952 have been taken in surface fisheries that catch smaller, predominately juvenile albacore. The major surface fisheries are the Canadian troll, USA troll and pole-and-line fisheries, and the Japanese pole-and-line fisheries. Longline fisheries, mainly Japanese and Chinese Taipei, catch less than 50% of north Pacific albacore by weight and generally catch larger and older albacore. Total annual catches of albacore in the north Pacific Ocean peaked in 1976 at about 126000 t, declined to the lowest level in 1991 at about 37000 t, then increased to a second peak in 1999 at about 125000 t. Catches in the stock assessment were treated as known with negligible error. Other information on environment and ecosystem exists, although it may not be used directly in the stock assessment.

These data have been sufficient to conduct assessments and to evaluate whether stocks are maintained at or above the biomass SSB-ATHL. Stock structure data are limited, but are consistent with North Pacific Ocean-wide stock. This meets SG80.

The scientific working group identified the lack of sex-specific size data, the absence of updated estimates of important life history parameters (natural mortality, maturity), and the simplified treatment of the spatial structure of north Pacific albacore population dynamics are the most important uncertainties. This indicates certain data gaps and perhaps a lack of good understanding of stock structure prevents information being comprehensive. Therefore, this does not meet SG100.

South Pacific Albacore

There is a regional register of all vessels actively fishing in the region as well as domestic records of fishing vessels with EEZs held locally. Information, while largely complete, is not comprehensive across all vessels, but adequate to allow stratification of vessels into fleets with similar operational characteristics. A total of 30 “fleets” were defined for the assessment based on nationality, spatial

location and time, with additional groupings based on temporal changes. Catch, effort and size composition data are complete for the fleets in the assessment. A limited amount of tag data was also available, but there are insufficient data to support the explicit spatial modelling available in MFCL. Significant environmental data, including information not directly relevant to the harvest strategy are available.

Overall, while there are data gaps, these do not relate to primary forms of catch and effort data used in the assessment, but to operational details of vessels. The SG80, but not SG100, is met.

1.2.3.b Monitoring		
60 Guidepost	80 Guidepost	100 Guidepost
Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.

North Pacific Albacore

While the management system will be able to tolerate some absence of data, all vessels that would be certified would be expected to comply with best practice in reporting their data.

The current harvest control rule requires a stock assessment to obtain accurate estimates of fishing mortality and biomass. Catch, including catch composition, data, and monitoring indices from several fleets' standardized CPUE data are adequate for this harvest control rule. The combined indices do appear to provide some picture of the change in abundance that has occurred.

External reviewers recommended extended use of tagging studies, but this has not occurred as of 2014. Tagging that has been conducted has not been very informative, suggesting a larger well-designed (and expensive) programme would be required. The data do not presently allow the harvest control rule to be monitored with a high degree of certainty, meeting SG80, but not SG100.

South Pacific Albacore

While the management system will be able to tolerate some absence of data, all vessels that would be certified would be expected to comply with best practice in reporting their data.

Catch data from all fleets are relatively complete and sufficient for the stock assessment. The abundance indices are primarily obtained from catch and effort data, particularly from the many longline fleets operating across the region, giving relatively long time series of information. Cohorts recruiting to specific fisheries are evident in catch length distributions making the data very informative on recruitment to the fishery. This meets SG80. However not all information for all fleets is available to the assessment, and the uncertainties with growth and the abundance indices are not fully understood, so SG100 is not met.

1.2.3.c Comprehensiveness of information		
60 Guidepost	80 Guidepost	100 Guidepost
	There is good information on all other fishery removals from the stock.	

North Pacific Albacore

Overall, catch data are sufficient to meet SG80. While some problems exist, they are being addressed and do not increase the risk for the assessment and management of the stock.

South Pacific Albacore

Catches appear to be reported at an acceptable level of accuracy for the stock assessment, meeting SG80. Data have been identified as missing, but these are generally related to operational data (fishing gear, target species and fishing activity) rather than catch. Discards, incidental mortality and recreational catch are not generally reported. As long as these sources of mortality remain constant and/or negligible, this lack of recording should not present a problem to the stock assessment.

Scoring for 1.2.3

North Pacific Albacore: All SG60 and SG80, but no SG100, are met. 80

South Pacific Albacore: All SG60 and SG80, but no SG100, are met. 80

References

Hoyle, S., Hampton, J. Davies, N. 2012. Stock Assessment of Albacore Tuna in the South Pacific Ocean. Scientific Committee Eighth Regular Session. Busan, Republic of Korea. 7-15 August 2012. WCPFC-SC8-2012/SA-WP-04-REV1.

ISC. 2014. Stock assessment of albacore in the North Pacific Ocean in 2014. Report of the Albacore Working Group Stock Assessment Workshop. International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean. 16 - 21 July 2014 Taipei, Taiwan. WCPFC-SC10-2014/SA-WP-12.

1.2.4 Assessment of stock status: There is an adequate assessment of the stock status.

1.2.4.a Appropriateness of assessment to stock under consideration		
60 Guidepost	80 Guidepost	100 Guidepost
	The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.

North Pacific Albacore

North Pacific albacore stock was assessed in 2014 using the Stock Synthesis 3 modelling framework. This is a modern well-tested statistical catch-at-age modelling approach that has wide application across a large number of fisheries.

24 fisheries were defined on the basis of gear, location, season, and the unit of catch (numbers or weight). Quarterly indices of relative abundance were developed for 11 fisheries. Catch was treated as known with low error.

These data have been sufficient to conduct assessments and to evaluate the harvest strategy of maintain stocks at or above the biomass SSB-ATHL. Stock structure data are limited, but are consistent with North Pacific Ocean-wide stock. However, some significant information is missing or poor (e.g. estimates of natural mortality), and there are opportunities to improve the assessment in future. Overall, the assessment is high quality and accounts for the data available, but not all aspects of the biology accurately. The assessment therefore meets SG80, but not SG100.

South Pacific Albacore

The assessment carried out in 2012, like the previous assessment in 2011, uses the integrated stock assessment software MULTIFAN-CL (or MFCL), under the assumption that there is a single stock of albacore tuna in the South Pacific Ocean. Parameters of the model are estimated by maximizing an objective function consisting of likelihood (data) and “prior” information. MFCL was specifically developed to take advantage of the tuna fishery data available from the region. The model has 20 age-classes with the catch, effort, size composition and tagging data used in the model classified by 30 fisheries and quarterly time periods from July 1960 through June 2011. The stock assessment is completed after a pre-assessment workshop which reviews the assessment and guides development. The assessment method is able to support all appropriate reference points and harvest control rules, attaining SG80.

There is evidence for improvements in the model covering standardization of longline catch and effort data to produce indices of abundance, the fecundity model used to define SSB, the growth model. However, biological research indicates spatial and sex-dependent variation in growth, which is not included in the model.

The model structure does not fully account for all features of the fishery. Although the stock assessment software has the ability to model features, results are sensitive to the growth model in particular, which is now thought to be inaccurate. Further improvements in the model structure may be required to meet SG100.

1.2.4.b Assessment approach		
60 Guidepost	80 Guidepost	100 Guidepost
The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	

North Pacific Albacore

The stock assessment has been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

South Pacific Albacore

The stock assessment has been used to estimate the MSY-related reference point, and these have been used to determine stock status. This meets SG80.

1.2.4.c Uncertainty in the assessment		
60 Guidepost	80 Guidepost	100 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.

North Pacific Albacore

Stock assessment methods which have been used, report uncertainty in estimates of stock status. Uncertainties have been examined as alternative model structures and the stock status associated with these alternatives have been evaluated. Probabilities have not been fully reported in the scientific advice and have not been carried through the Kobe plots and Kobe strategy matrix (phase diagram of fishing mortality versus SSB at time and projections of the probability of exceeding reference points for alternative catch levels, respectively). The treatment of uncertainty meets SG80, but the lack of reported probabilistic information prevents attaining SG100.

South Pacific Albacore

The MFCL software fits the population model to the data using likelihood. While not claiming to be fully Bayesian (probabilistic), it does include “priors” and penalties to improve estimation and produce likelihood profiles for estimate values of interest, which are used as a measure of uncertainty. However, the assessment recognizes structural errors as the largest source of uncertainty, and therefore produces ranges from sensitivity analyses as a better indicator of uncertainty.

The assessment reports a conflict between the CPUE and length frequency data, and it is suspected that separate growth models by sex and location may be required to resolve this. The model results are highly sensitive to the growth curve, so this is a key source of structural uncertainty.

A relatively large number of sensitivity analyses have been conducted on the stock assessments for this species, as recommended by the stock assessment preparatory meeting as well as identified by the assessment scientists. An “uncertainty analysis”, which tried all combinations of sensitivity

analyses, was used to consider both individual uncertainties and their interactions. While the assessment deals well with all main uncertainties, meeting SG80, it not clear how these uncertainties might be used in decision-making, except in a very general way. Given the assessment indicates that the stock is well above any target reference point, more probabilistic approaches, such as the Kobe II strategy matrices, are unlikely to influence decision making. However, scoring consistent with other fisheries indicate SG100 is not met.

1.2.4.d Evaluation of assessment		
60 Guidepost	80 Guidepost	100 Guidepost
		The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.

North Pacific Albacore

There is insufficient evidence that the model structure has yet been rigorously explored. Various sensitivity analyses are used explore alternative assumptions and model structures. These are chosen presumably based on expert review during workshops. Diagnostics are presented and suggest the assessment is robust, but more evidence is required to claim alternative hypotheses have been rigorously explored, so SG100 is not met.

South Pacific Albacore

Alternative hypotheses and assessment approaches have been explored. Many of the underlying structural assumptions of the model have been reviewed and the assessment model and/or data have been adjusted to match research findings and changes in expert opinion and judgment. This constant review and adjustment is good practice and should reduce structural errors in the model. The open documentation and model review process increases confidence in the robustness of the assessment. Model diagnostics indicate that some sources of bias have been removed, but that some significant problems remain, and suggest the assessment is not robust yet. However, meeting SG100 requires further evidence.

1.2.4.e Peer review of assessment		
60 Guidepost	80 Guidepost	100 Guidepost
	The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.

North Pacific Albacore

The original SS3 stock assessment of North Pacific albacore was externally reviewed in 2011. The workshop in which the stock assessment was done constitutes an “internal” review, although participants included scientists representing nations, RFMOs and industry, meeting SG80. External reviews also took place on the original 2011 assessment. The recommendations from these reviews, together with advances in understanding of growth, life history, catchability and selectivity, have been used to improve the stock assessment. Because there is evidence of internal and external review, and appropriate response to these, the fishery meets SG100.

South Pacific Albacore

The stock assessment has been developed and continues to be used by the SPC. The method has been well-documented and published in peer-review journals. The assessment is conducted by several scientists at the SPC and then presented to and reviewed by a pre-assessment workshop, the WCPFC Scientific Committee, meeting SG80. The WCPFC is considering independent external review, but the approach will depend on costs. Without an external review, SG100 cannot be met.

Scoring for 1.2.4

North Pacific Albacore: All SG60 and SG80 are met, and 1 out of 4 SG100 are met. 85

South Pacific Albacore: All SG60 and SG80, but no SG100, are met. 80

References

Hoyle, S., Hampton, J. Davies, N. 2012. Stock Assessment of Albacore Tuna in the South Pacific Ocean. Scientific Committee Eighth Regular Session. Busan, Republic of Korea. 7-15 August 2012. WCPFC-SC8-2012/SA-WP-04-REV1.

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Principle 3: Effective management

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.

Regional Fisheries Management Organisations

3.1 Governance and Policy

3.1.1 Legal and/or customary framework: The management system exists within an appropriate and effective legal and/or customary framework which ensures that it:

- Is capable of delivering sustainability in the UoA(s)

- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and

- Incorporates an appropriate dispute resolution framework.

3.1.1.a Compatibility of laws or standards with effective management		
60 Guidepost	80 Guidepost	100 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 partie**s which delivers management outcomes consistent with MSC Principles 1 and 2.

International Commission for the Conservation of Atlantic Tunas

Fishing for tuna and tuna like species, both on the high seas and in zones of national jurisdiction, is governed by the International Conventions on the Conservation of Atlantic Tuna (ICCAT) of 1966. The Commission is established under the Convention and is tasked to co-ordinate scientific research and make recommendations designed to maintain populations of tuna at levels which will permit maximum sustainable yield. The Commission has adopted minimum permissible weight limits at which tuna may be caught and retained, overall catch limits for various species, time-area closures, gear regulations and schemes for international and port inspection. The basic texts of ICCAT were first issued in 1972. Revised and updated versions were issued in 1977, 1985, 2003 and 2005. Although a recent review recommended modernising these texts to reflect current approaches to fisheries management, they remain generally consistent with MSC Principles and Criteria (MSC P&C).

The most relevant international legislation is the Law of the Sea 1982 Convention and the Fish Stocks Agreement 1995. The purpose of the 1995 UN Fish Stocks Agreement (UNFSA) is to facilitate the

implementation of certain provisions of the 1982 Convention concerning the conservation and management of straddling fish stocks and highly migratory fish stocks. The Agreement complements the 1993 FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (1993 FAO Compliance Agreement) and the 1995 FAO Code of Conduct for Responsible Fisheries. This legislation and guidance requires co-operation among states through international institutions where appropriate, and in the case of Atlantic tunas, ICCAT performs this function. UNFSA is particularly important in the case of highly migratory species as addressed by ICCAT, since this is a focus of this legislation.

Duties similar to those elaborated in UNFSA are also set out in article 8 of the FAO Code of Conduct for Responsible Fisheries (CCRF). While CCRF is not binding, it does set out best practice and therefore provides a broad structure through which fisheries can be evaluated.

Although ICCAT pre-dates much of the relevant international legislation on the management of fisheries, it is compliant with that legislation and sets out to meet the requirements of those laws relevant to the management of shared stocks.

28 out of 50 CPCs to ICCAT have not ratified the UNFSA. These articles underpin the MSC P&C, and therefore failure to ratify the UNFSA does suggest that the state may not have acceded to these principles, and other evidence in each case should be sought. Any fishery operating within the jurisdiction of a state which has not ratified the UNFSA will need to demonstrate through other means that the laws it is applying are entirely consistent with the MSC P&C. Otherwise ICCAT sanctioned fisheries should meet the SG80, but the lack of binding procedures prevent the fisheries meeting SG100.

Indian Ocean Tuna Commission

The IOTC framework created in 1998 provides for an organised and effective co-operation among parties. The operating procedures (IOTC rules of procedures) are fully transparent and are posted on the IOTC website. The restrictions on the membership could affect the ability of IOTC to take effective conservation and management measures, because unrecognised governments, notably Chinese Taipei, cannot be a member or a cooperating party of IOTC, and, therefore cannot formally fulfil its obligations to cooperate with IOTC. This may not meet SG60 which requires a complete framework for co-operation. However, various “work-arounds” have been applied to allow Chinese Taipei to take part and they co-operate with international procedures, including the scientific observer programme. This level of co-operation is sufficient to meet SG80, but because it is not binding, SG100 cannot be met.

Western and Central Pacific Fishery Commission

Fishing for tuna and tuna like species, both on the high seas and in zones of national jurisdiction, is governed by the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention). The Commission was established under the Convention and is tasked to co-ordinate scientific research and make recommendations designed to maintain populations of tuna and species sharing the same ecosystem same at levels which will prevent recruitment failure and permit maximum sustainable yield. The WCPF Convention entered into force on 19 June 2004.

The WCPF Convention draws on many of the provisions of the UN Fish Stocks Agreement. It also is designed to reflect the regional political, socio-economic, geographical and environmental characteristics of the western and central Pacific Ocean.

The WCPF Convention seeks to address problems in the management of high seas fisheries resulting from unregulated fishing, over-capitalization, excessive fleet capacity, vessel re-flagging to escape controls, insufficiently selective gear, unreliable databases and insufficient multilateral cooperation in respect to conservation and management of highly migratory fish stocks.

A framework for the participation of fishing entities in the Commission which legally binds fishing entities to the provisions of the Convention, participation by territories and possessions in the work of the Commission, recognition of special requirements of developing States, and cooperation with other Regional Fisheries Management Organizations (RFMO) whose respective areas of competence overlap with the WCPFC reflect the unique geo-political environment in which the Commission operates.

10 out of 34 members and co-operating non-members to WCPFC have not ratified the UNFSA. These articles underpin the MSC P&C, and therefore failure to ratify the UNFSA does suggest that the state may not have acceded to these principles. Any fishery operating within the jurisdiction of a state which has not ratified the UNFSA will need to demonstrate through other means that the laws it is applying are entirely consistent with the MSC P&C. Otherwise WCPFC sanctioned fisheries should meet SG100, since it provides a system for effective co-operation among the parties and procedures can apply binding measures, so co-operation among parties to be enforced with a majority, meeting SG100.

Inter-American Tropical Tuna Commission

Fishing for tuna and tuna like species, both on the high seas and in zones of national jurisdiction, is governed by Antigua Convention of 2003, which brings up to date the provisions of the previous 1949 Convention between the United States of America and the Republic of Costa Rica for the establishment of an Inter-American Tropical Tuna Commission. The Commission was established under the Convention and is tasked to co-ordinate scientific research and to make recommendations designed to maintain populations of tuna at levels which will permit maximum sustainable yield. The Antigua Convention entered into force on 27 August 2010.

The Antigua Convention explicitly recognizes the United Nations Convention on the Law of the Sea (UNCLOS) of 1982, the Rio Declaration on Environment and Development and Agenda 21, the Johannesburg Declaration and Plan of Implementation adopted by the World Summit on Sustainable Development (2002), the FAO Code of Conduct for Responsible Fisheries (1995), including the 1993 FAO Compliance Agreement and International Plans of Action adopted by FAO within the framework of the Code of Conduct, and the 1995 UN Fish Stocks Agreement (UNFSA). The Convention clearly intends to form part of the implementation of these international agreements within its area of jurisdiction. Its provisions are consistent with MSC Principles and Criteria (MSC P&C).

The Convention provides an effective framework for co-operation among the parties which exploit tuna stocks that are within the jurisdiction of the convention, meeting SG80. However, the procedures are only binding to the extent that they can be agreed among the parties. Decisions are made by consensus and therefore co-operation is effectively not binding, so SG100 is not met. The national legal system would be a determining factor in this scoring issue.

3.1.1.b Resolution of disputes		
60 Guidepost	80 Guidepost	100 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 UoA.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes that is appropriate to the context of the fishery and has been **tested and proven to be effective.**

International Commission for the Conservation of Atlantic Tunas

There are three mechanisms for dealing with legal disputes at the international level. Firstly, disputes can be dealt with at the annual meetings of the CPCs through consultation and conciliation. Secondly, technical disputes might be resolved by an appropriately composed expert or technical panel. Thirdly, disputes that remain unresolved might be resolved through either the International Court of Justice (ICJ) or the International Tribunal for the Law of the Sea. The first two mechanisms are arguably the main overall purpose of ICCAT.

ICCAT has no formal dispute resolution procedure within the convention, but the meetings provide an opportunity to resolve disputes informally. Such disputes are still considered legal in that they set out to resolve issues defined in the 1982 UN Law of the Sea Convention.

ICCAT (the Commission) is not subject to any court challenges as of 2011. There is no evidence that other entities flout the law, with the notable exception of particular fishing companies and fishing vessels, which are listed on the IUU fishing list. CPCs have avoided resorting to using international law to settle disputes. By resolving disputes through ICCAT meetings (being members of ICCAT and agreeing to abide by ICCAT provisions), the CPCs have pro-actively avoided legal disputes.

50 ICCAT contracting parties (in 2014), who along with observers and co-operating non-contracting parties, have representatives at ICCAT meetings. In accordance with the Convention, the Commission holds a regular meeting every other year and a special meeting in alternate years. The Commission can, on the basis of scientific evidence and of other relevant information, adopt recommendations and resolutions with the objective of maintaining ICCAT stocks around MSY. Negotiations on these occur both at technical and political levels. Normally, Recommendations and Resolutions are drafted by auxiliary bodies (such as the 4 species-group Panels, or the Compliance Committee), and are presented to the Commission for adoption.

This system is transparent in that it makes sure that all members are fully informed of the issues under consideration and are able to participate in informed discussion. ICCAT requires that final decisions and the adoption of management recommendations may be made only in plenary at the annual meeting. However disputes resolved in this way would still not necessarily be entirely transparent in the sense that how a resolution is reached may not be fully reported. However, independent observers, including NGO and IGOs, are present at such meetings and would observe any resolutions and justifications that are presented.

Objections can be lodged against recommendations, eventually allowing any party to “opt out”. This could, at least in the short term, prevent timely dispute resolution due to the lack of an effective

arbitration procedure. Objections have been used to prevent recommendations being fully implemented. Within the context of an international system, the dispute cannot override a nation's sovereign rights, but nevertheless a better dispute mechanism could be provided through providing formal arbitration and conciliation procedures to remove the necessity for objections over conservation issues.

Perhaps not surprisingly, any provisions within ICCAT would not deal with disputes including Non-contracting Parties. It is capable of exercising sanction, however, as demonstrated by the sanctions levied against St Vincent & Grenadines. This should encourage all participants in the fishery to make use of the dispute resolution procedures that ICCAT offers.

It is, at least in theory, possible for international disputes to be resolved through the International Court of Justice (ICJ) or through the International Tribunal for the Law of the Sea (ITLOS) if they cannot be resolved in more efficient ways. This has been used by CPCs in other RFMOs (e.g. WCPFC: ITLOS Cases Nos 3 & 4 between New Zealand, Australia and Japan), but so far no cases have taken place among ICCAT members over issues relevant to tuna conservation. This recourse is most likely to be used by states which have ratified the UNFSA, in which such a provision is made. Therefore, where a fishery is not under the jurisdiction of a state which has ratified UNFSA, it may be questioned how effective this option would. For states which have ratified UNFSA, it is likely this mechanism would be transparent and effective, meeting SG80. However, it has not been tested and proven effective yet, and therefore could not meet SG100.

Non-Contracting Parties can apply to become Co-operating Non-contracting Parties, which implement the measures and requirements set by ICCAT, even if not becoming a full Contracting Party.

The presence of observers and the requirement that decisions are made in plenary makes the process transparent. In ICCAT, observers are admitted under rule 5 of the rules of procedure. Observers are not required to reapply annually after the grant of observer status, and they may also present statements and documents to the meetings of the Commission and its subsidiary bodies. This makes the observer status reasonably accessible to interested groups.

There are explicit and transparent decision-making and dispute resolution mechanisms defined and in place, meeting SG60. However, the system cannot be considered fully effective with the current objections procedure, which does not represent "best practice". The objectives can and have affected fisheries attempting to implement conservation measures, which prevents the fishery meeting SG80. Neither have the other dispute resolution procedures in existence been tested or proven to be effective. There are no outstanding disputes among members for the fisheries considered here, but no disputes have been referred to ICJ/ITLOS. The effectiveness of the other informal ICCAT mechanisms is unclear, and it seems likely many disputes are in abeyance rather than resolved. This may prevent these fisheries meeting SG100 even if the objections mechanism was improved.

Indian Ocean Tuna Commission

There are three mechanisms for dealing with legal disputes at the international level. Firstly, disputes can be dealt with at the annual meetings of the CPCs through consultation and conciliation. Secondly, technical disputes might be resolved by an appropriately composed expert or technical panel. Thirdly, disputes that remain unresolved might be resolved through either the International Court of Justice or the International Tribunal for the Law of the Sea. The first two mechanisms are arguably the main overall purpose of an RFMO in general and IOTC in particular.

IOTC has no formal dispute resolution procedure within the convention, but the meetings provide an opportunity to resolve disputes informally. Such disputes are still considered legal in that they set out to resolve issues defined in the 1982 UN Law of the Sea Convention.

The IOTC holds annual meetings at which they consider Resolutions for management measures and other technical actions. This system is transparent in that it makes sure that all members are fully informed of the issues under consideration and are able to participate in informed discussion. However disputes resolved in informal negotiations would not necessarily be entirely transparent. However, independent observers, including NGO and IGOs, are present at such meetings and would observe any resolutions and justifications that are presented.

The rules of procedure specify voting procedures for issues coming before the Commission including personnel matters. For example “Conservation and management measures binding on Members of the Commission must be adopted by a two-thirds majority of Members present and voting. Individual members objecting to a decision are not bound by it. If objections to a measure are made by more than one-third of the Members of the Commission, the other Members are not bound by that measure; but this does not preclude any or all of them from giving effect.” In fairness, the IOTC is relatively new and the major effort since its inception has been to establish catch and other data for scientific use and compliance. As such the management measures that have been adopted thus far have focused on this issue and the technical means to achieve it.

There are no current outstanding judicial disputes. So far CPCs have avoided resorting to using international law to settle disputes. However, since the process is relatively new the management system has not demonstrated it will act proactively and there are no sanctions yet in place for CPCs not complying with their obligations.

It is, at least in theory, possible for international disputes to be resolved through the International Court of Justice (ICJ) or through the International Tribunal for the Law of the Sea (ITLOS) if they cannot be resolved in more efficient ways. This has been used by CPCs in other RFMOs (e.g. WCPFC: ITLOS Cases Nos 3 & 4 between New Zealand, Australia and Japan), but as mentioned the actions taken have tended to be technical and with limited controversy. This may change as the Commission is currently developing allocation mechanisms both between States and internal to the States.

Note that the PRP highlighted the lack of compliance and the resulting uncertainty in the data. However, the compliance that they were discussing largely related to reporting of catches and other stewardship responsibilities often by non-members. Again since management measures are fairly limited, there are few other compliance problems. This meets SG80. However, there are many problems with CPC compliance which have yet to be resolved, and therefore it has not been proven fully effective, so SG100 is not met.

Western and Central Pacific Fishery Commission

There are three mechanisms for dealing with legal disputes at the international level. Firstly, disputes can be dealt with at the WCPFC annual meetings of the members through consultation and conciliation. Secondly, disputes might be resolved by an appropriately composed review panel. Thirdly, disputes might be resolved through either the International Court of Justice (ICJ) or the International Tribunal for the Law of the Sea. The first two mechanisms are arguably the main overall purpose of all RFMOs including WCPFC.

WCPFC (the Commission) is not subject to any court challenges as of 2014. It does not indicate any disrespect or defiance of the law through repeated violations. There is no evidence that other entities flout the law, with the notable exception of particular fishing companies and fishing vessels, which are listed on the IUU fishing list.

WCPFC has a dispute resolution procedure within its convention (Annex I and II). The procedure is reasonably prescriptive. While encouraging resolution of disputes among its members, it provides for an appropriate review panel to be convened should it be necessary. An application for a review of a Commission decision can be submitted within 30 days by written notification to the Commission Executive Director. The application is required to state the grounds for the dispute.

In addition, the Convention also allows for disputes between fishing entities to be submitted to final and binding arbitration through a Permanent Court of Arbitration (The Hague) at the request of either party. However, this provision as of 2014 does not appear to have been used (i.e. if any arbitration is being carried out, it is not in the public domain). The Convention proscribes peaceful settlement of all disputes (Article 31).

WCPFC members and observers can have representatives at meetings. In accordance with the Convention, the Commission holds a regular meeting every year. The Commission can, on the basis of scientific evidence and of other relevant information, adopt binding measures and non-binding resolutions with the objective of maintaining stocks around MSY, giving due consideration to the integrity of the ecosystem and biodiversity. Negotiations on these occur both at technical and political levels. Conservation and Management Measures and Resolutions are proposed by members of the Commission, and are presented to the Commission for adoption at the annual meeting. Non-parties to the convention can apply to become Co-operating Non-members, which implement the measures and requirements set by WCPFC, even if not becoming a full member of the Commission (CMM 2009-11).

This system is transparent in that it makes sure that all members are fully informed of the issues under consideration and are able to participate in informed discussion. Under Article 21 of the Convention, the Commission is required to promote transparency in its decision-making processes and other activities. This is addressed in detail in the Rules of Procedure. Independent observers, including NGO and IGOs, are present at such meetings and would observe any resolutions and justifications that are presented. Such organizations shall be given timely access to pertinent information subject to the rules and procedures which the Commission may adopt. It should be noted that although observers are allowed to make presentations to members, subject to approval of the chairperson. Disputes resolved in this way would still not necessarily be entirely transparent in the sense that how a resolution is reached may not be fully reported.

There is no “opt out” to Conservation and Management Measures (CMM). While the Commission encourages consensus, more contentious CMM may be passed through 75% majority vote both among Pacific Islands Forum Fisheries Agency (FFA) members and non-FFA members unless consensus is expressly required. FFA represents the independent Pacific Island states, non-members the main external fishing nations seeking access. If consensus is required, the Commission is required to promote conciliation. No explanation is required, but meetings do report discussion.

It is, at least in theory, possible for international disputes to be resolved through the International Court of Justice (ICJ) or through the International Tribunal for the Law of the Sea (ITLOS) if they cannot be resolved in more efficient ways. This has been used by WCPFC (ITLOS Cases Nos 3 & 4 between New Zealand, Australia and Japan), but only for southern bluefin which is not covered by this assessment. This recourse is most likely to be used by states which have ratified the UNFSA, in which such a provision is made. Therefore, where a fishery is not under the jurisdiction of a state which has ratified UNFSA, it may be questioned how effective this option would be. For states which have ratified UNFSA, it is likely this mechanism would be transparent and effective, meeting SG80. However, it has not been tested and proven effective yet, and therefore could not meet SG100.

There are explicit and transparent decision-making and dispute resolution mechanisms defined and in place, meeting SG60. The consensus and voting procedures are considered to be effective. There are no outstanding disputes among members for the fisheries considered here. A dispute over southern bluefin (not considered here) has been referred to ICJ/ITLOS, proving the possibility of using this recourse. The effectiveness of the other informal WCPFC mechanisms is unclear, and it is

possible that some disputes are in abeyance rather than resolved. However, overall the available evidence indicates these fisheries are meeting both SG80 and SG100.

Inter-American Tropical Tuna Commission

There are three mechanisms for dealing with legal disputes at the international level. Firstly, disputes can be dealt with at the IATTC annual meetings of the Parties through consultation and conciliation. Secondly, technical disputes might be resolved by an appropriately composed expert or technical panel. Thirdly, disputes might be resolved through either the International Court of Justice (ICJ) or the International Tribunal for the Law of the Sea. The first two mechanisms are arguably the main overall purpose of IATTC.

IATTC (the Commission) is not subject to any court challenges as of 2014. It does not indicate any disrespect or defiance of the law through repeated violations. There is no evidence that other entities flout the law, with the notable exception of particular fishing companies and fishing vessels, which are listed on the IUU fishing list.

IATTC has a dispute resolution procedure within the Antigua Convention (Article XXV). The procedure is not prescriptive but strongly encourages resolution of disputes among its Parties and provides for a technical panel to be convened should it be necessary. The annual meetings provide an opportunity to resolve such disputes informally. However, there is no formal resolution procedure should this fail.

21 IATTC contracting parties (in 2014), who along with observers and 4 co-operating non-contracting parties, have representatives at meetings. In accordance with the Convention, the Commission holds a regular meeting every year. The Commission can, on the basis of scientific evidence and of other relevant information, adopt recommendations and resolutions with the objective of maintaining IATTC stocks around MSY. Negotiations on these occur both at technical and political levels. Recommendations and Resolutions are proposed by members of the IATTC Commission, and are presented to the Commission for adoption at the annual meeting.

This system is transparent in that it makes sure that all members are fully informed of the issues under consideration and are able to participate in informed discussion. Independent observers, including NGO and IGOs, are present at such meetings and would observe any resolutions and justifications that are presented. It should be noted that although observers are allowed to make presentations to members, this is only available if members and the chairperson do not object. Disputes resolved in this way would still not necessarily be entirely transparent in the sense that how a resolution is reached may not be fully reported.

Non-parties to the convention can apply to become Co-operating Non-Parties, which implement the measures and requirements set by IATTC, even if not becoming a full member of the Commission.

There is no “opt out” to resolutions, but resolutions do require consensus, so Parties can essentially apply a veto to decisions even if they are not present at the meeting. No explanation is required, but meetings do report discussion. There is no system of arbitration or conciliation where differences arise among parties over recommendations.

It is, at least in theory, possible for international disputes to be resolved through the International Court of Justice (ICJ) or through the International Tribunal for the Law of the Sea (ITLOS) if they cannot be resolved in more efficient ways. This has been used by CPCs in other RFMOs (e.g. WCPFC: ITLOS Cases Nos 3 & 4 between New Zealand, Australia and Japan), but so far no cases have taken place among IATTC members over issues relevant to tuna conservation. This recourse is most likely to be used by states which have ratified the UNFSA, in which such a provision is made. Therefore, where a fishery is not under the jurisdiction of a state which has ratified UNFSA, it may be questioned how effective this option would be. For states which have ratified UNFSA, it is likely this

mechanism would be transparent and effective, meeting SG80. However, it has not been tested and proven effective yet, and therefore could not meet SG100.

The presence of observers and the requirement that decisions are made in plenary makes the process transparent. In IATTC, observers to the meetings are governed Annex 2 of the Convention and by Rule 13 of the rules of procedure. As long as the NGO can meet the various time requirements, and can submit adequate information justifying their presence, they may participate in meetings unless at least one-third of the members of the Commission object in writing. This makes the observer status reasonably accessible to interested groups.

There are explicit and transparent decision-making and dispute resolution mechanisms defined and in place, meeting SG60. However, the system cannot be considered fully effective with consensus decision-making process, and the lack of a formal dispute mechanism should consensus system fail. A better system would allow some sort of majority voting or arbitration which might prevent necessary conservation measures being stalled by a single party. There are no outstanding disputes among members for the fisheries considered here, but no disputes have been referred to ICJ/ITLOS. Overall, available evidence suggests the system is meeting SG80. The effectiveness of the other informal IATTC mechanisms is unclear, and it possible that many disputes are in abeyance rather than resolved. These issues would prevent these fisheries meeting SG100.

3.1.1.c Respect for rights		
60 Guidepost	80 Guidepost	100 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 on people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.

International Commission for the Conservation of Atlantic Tunas

ICCAT provides only for the rights of nations to fish resources. How these distributed among groups within the nation state depends on national policy and legislation (such as Canadian First Nations to swordfish resources; Devitt et al. 2010).

Where tested, the national legal and/or customary framework for management of stocks has been found to comply with SG80 on this scoring issue, although such tests have been limited. The fisheries of both St. Helena (Carleton et al. 2010) and Canada (Devitt et al. 2010) have been found to have sufficient provision to protect fishing rights of its citizens. Little reliance was placed on ICCAT for meeting the scoring guideposts in these previous MSC assessments.

Among States, ICCAT allocates quota based often, but not always, on a CPC's track record in the fishery. Measures are based on specific periods of activity. For example, CPCs have been required to limit the number of their commercial fishing vessels larger than 24 meters length fishing for bigeye tuna in the Convention area to the average number of its fishing vessels actually having fished for bigeye tuna in the Convention area over 1991 and 1992, so as not to increase the total fishing capacity. However, it is noteworthy that ICCAT also has taken account of developing country

capacity in developing their fisheries where traditional fisheries may not have previously existed. Otherwise Atlantic tunas, outside the Mediterranean, were not subject to widespread traditional fisheries, due to limitations of technology for operating on the high seas.

ICCAT's internal allocation criteria, developed in 2001, now include eight standards relating to the status of qualified participants. These include the interests of artisanal subsistence coastal fishers and coastal communities, coastal states whose economies are overwhelmingly dependent on the exploitation of marine resources, the socio-economic contribution of the fisheries to the developing States, especially small island States, the economic and/or social importance of the fishery based on historical use, the contribution of the fishery to national food security, domestic consumption, income resulting from exports and employment, and the right of qualified participants to engage in fishing on the high seas for the stocks to be allocated.

The criteria are applied on a stock-by-stock basis by the relevant ICCAT panels according to certain conditions, including the requirements that they are to be applied gradually to allow industry to adapt, be fair and equitable, allow opportunities for all qualifying participants, be consistent with international law, prevent and eliminate overfishing and excess fishing capacity, do not legitimize IUU catches and encourage cooperation between developing States and other States. Since 2001, the ICCAT allocation criteria have been applied in such a way as to increase fishing opportunities for a number of developing States.

These criteria are less binding than in some other RFMOs (WCPFO), and exactly how conflicting interests among these criteria might be resolved is unclear. Nevertheless, ICCAT does apply best practice in the sense that it tries to resolve these issues considering all valid criteria.

Several ICCAT contracting parties have made available substantial funds to finance improved data collection and reporting activities and to help with travel assistance for scientific meetings. These funds are destined exclusively for scientists from developing countries.

ICCAT has developed methods and an intention to allow access to the resources under its purview, and these are consistent with MSC Principles 1 and 2. Therefore the international management system meets the requirement for SG60 and SG80. While ICCAT has demonstrated the intention to develop and implement methods to allow a fair distribution and mechanisms to achieve this objective, such mechanisms are not formal commitments, just statements of what arguments might be admissible in determining fishing rights allocation. As a result, this does not meet SG100.

Indian Ocean Tuna Commission

IOTC provides only for the rights of nations to fish resources. How these distributed among groups within the nation state depends on national policy and legislation. Essentially, the IOTC is just now entering into formal negotiations on access rights and allocations. Thus far, debates have addressed common allocation principles such as historical participation, the rights of Coastal States and the rights of developing States. As a result, this does not yet meet SG100.

Western and Central Pacific Fishery Commission

Legal rights of people dependent on fishing for food or livelihood are protected through national interests of Parties to the Convention. The Convention deals with the rights of a State's access to resources and, in this case, explicitly protects access for subsistence and traditional resource use. This takes the form of a formal declaration within the Convention itself, with references made to small island developing states, subsistence and artisanal fishing. Protection of rights is also extended to dependent territories, such as French Polynesia and American Samoa. Furthermore, WCPFC has

an explicit relationship with the Pacific Islands Forum Fisheries Agency, which represents the interests of the independent island States in the region. These interests demonstrably protect their people's traditional rights to these resources. The recent performance review identified the ambiguity in the Convention concerning consistent management throughout oceanic, territorial and archipelagic waters and a lack of criteria for allocating fishing quotas as legal issues to resolve.

Stated objectives and management measures are consistent with Principle 1. WCPFC also has demonstrable objectives consistent with MSC Principle 2 under its principles for conservation and management (Article 5). This include consideration of the impacts of fishing, other human activities and environmental factors on species belonging to the same ecosystem as the target stocks, protection of biodiversity, and measures to minimize waste, effects of lost fishing gear, pollution, and by-catch.

WCPFC has an intention and has a management system that observes 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. Therefore the international management system meets the requirement for SG60 and SG80.

Inter-American Tropical Tuna Commission

Legal rights of people dependent on fishing for food or livelihood are protected through national interests of Parties to the Convention. The Convention deals with the rights of a State's access to resources rather than individuals. It is therefore likely that most weight would be given to national provisions for legal rights in a fishery when it is being assessed.

Stated objectives and management measures are consistent with Principle 1. IATTC also has demonstrable objectives consistent with MSC Principle 2 in the IDCP, which aims to eliminate dolphin mortality (ETP species) as part of purse seine operations, and in other conservation measures which protect the ecosystem.

Among States, IATTC allocates fishing rights broadly based on a Party's track record in the fishery. Bigeye catch limits have been applied to national fleets based on past catches. Overall limits on capacity and effort are based on past levels, although such levels may not be precisely determined. The overall limits on fishing activity and the way these limits are distributed among nations should allow nations to protect traditional fishing rights.

Smaller vessels and more artisanal gears are excluded from many measures. Pole-and-line, troll, and sport fishing vessels, and purse-seine vessels less than 182 metric tons carrying capacity and longline vessels less than 24m length are exempt from various measures designed to limit fishing activity on bigeye and yellowfin tuna stocks. Furthermore, purse-seine vessels with between 182 and 272 metric tons carrying capacity are provided for higher fishing effort provided that they carry an observer for the International Dolphin Conservation Program (AIDCP). These exemptions are clearly designed to protect some artisanal fleet.

IATTC has an intention and has a management system that 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. Therefore the international management system meets the requirement for SG60 and SG80. While IATTC has demonstrated the intention to develop and implement methods to allow a fair distribution and mechanisms to achieve this objective, such mechanisms are not formal commitments. As a result, this does not meet SG100.

Scoring for 3.1.1

International Commission for the Conservation of Atlantic Tunas: All SG60 and 2 out of 3 SG80 are met. 75

Indian Ocean Tuna Commission: All SG60 and SG80, but no SG100, are met. 80

Western and Central Pacific Fishery Commission: All SG60 and SG80 are met, and 2 out of 3 SG100 are met. 95

Inter-American Tropical Tuna Commission: All SG60 and SG80, but no SG100, are met. 80

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3.1.2 Consultation, roles and responsibilities: 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.

3.1.2.a Roles and responsibilities		
60 Guidepost	80 Guidepost	100 Guidepost
Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for key areas** of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction.

International Commission for the Conservation of Atlantic Tunas

ICCAT is itself an organization set up to define roles and responsibilities for its contracting parties and co-operating non-contracting parties. These functions, roles and responsibilities are explicitly defined. Among ICCAT's responsibilities to ensure that CPCs understand their areas of responsibility and interaction. On the whole, it is successful in many areas, including providing basic catch data and catch sampling, implementing research programs and ensuring stock assessments and scientific advice are provided in a timely manner.

The performance of the Secretariat is sound and well regarded as both efficient and effective by CPCs. The CPCs themselves vary in their ability to perform their role, but the roles and responsibilities are nevertheless explicitly defined at least at the national level for key areas. Key areas include providing catch and monitoring data to the ICCAT Secretariat, taking part in various meetings sharing information and making decisions, meeting the requirements for conservation and other recommendations for ICCAT and applying appropriate levels of control and surveillance.

With respect to implementing management controls, providing monitoring data and scientific research, tasks are allocated, coordinated and monitored through ICCAT and its annual meetings. This system broadly works. Organizations and individuals involved in the management process in those cases limited to Contracting Parties will be well-defined for key areas.

Roles and responsibilities are not well defined or well understood in many areas, however. ICCAT has had a number of problems with flag states that have not applied appropriate controls to their

vessels, CPCs not submitting timely data and not in the correct form, and so on. Some problems in providing basic data on vessels and catches are likely due to a lack of understanding of requirements which appear to be complex. While these problems are not all in key areas in the sense that they do not prevent ICCAT completing many of its tasks, they nevertheless undermine its overall effectiveness and increase risks for fishery sustainability. The establishing of a capacity building fund (Rec 2013-91) and a meeting participation fund (Rec 2014-14) could help address this problem. Hence the fisheries do not meet SG80 and SG100.

Although roles within ICCAT and among its CPCs are well defined, these are not necessarily understood by entities within nations. This would have to be evaluated for each fishery. Furthermore, while responsibilities might be understood, it does not follow that those responsibilities are met, as in the case of Eastern Atlantic bluefin tuna. However, this problem, where it occurs, may be picked up under other performance indicators.

Indian Ocean Tuna Commission

As noted the IOTC Rules of Procedure define roles and responsibilities for its contracting parties and co-operating non-contracting parties. Collectively it is the responsibility of CPCs and the Secretariat to ensure that CPCs understand their areas of responsibility and interaction. On the whole, it is successful in many areas, including providing basic catch data and catch sampling, implementing research programs and developing initial stock assessments and scientific advice.

The performance of the Secretariat is sound and well regarded as both efficient and effective by CPCs. The CPCs themselves vary in their ability to perform their role, but the roles and responsibilities are nevertheless explicitly defined at least at the national level for key areas. Key areas include providing catch and monitoring data to the Secretariat, taking part in various meetings sharing information and making decisions, meeting the requirements for conservation and other recommendations.

Roles and responsibilities are not well defined or well understood in many areas, however. IOTC has had problems with flag states that have not applied appropriate controls to their vessels, not submitting timely data and so on. While these problems are not all in key areas in the sense that they do not prevent IOTC from completing many of its tasks, they nevertheless undermine its overall effectiveness and increase risks for fishery sustainability. Hence the fisheries do not meet SG80 and SG100.

Western and Central Pacific Fishery Commission

WCPFC is itself an organization set up to define roles and responsibilities for its parties and co-operating non- parties. Functions, roles and responsibilities are explicitly defined at the international level. The Parties themselves may vary in their ability to perform their role, but the roles and responsibilities are nevertheless explicitly defined at least at the national level for key areas. Key areas include providing catch and monitoring data to the Secretariat, taking part in various meetings sharing information and making decisions, meeting the requirements for conservation and other recommendations for WCPFC and applying appropriate levels of control and surveillance.

WCPFC co-operates with all relevant organization in the region, which are the Secretariat of the Pacific Community (Oceanic Fisheries Programme), Pacific Islands Forum Fisheries Agency (FFA), the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC), Secretariat for the Pacific Regional Environment Programme (SPREP), Indian Ocean Tuna Commission (IOTC), Inter-American Tropical Tuna Commission (IATTC), Commission for the

Conservation of Antarctic Marine Living Resources (CCAMLR), Commission for the Conservation of Southern Bluefin Tuna (CCSBT), Agreement for the Conservation of Albatross and Petrels (ACAP) and North Pacific Anadromous Fish Commission (NPAFC). There is a Memorandum of Understanding which clearly lays out the type and level of co-operation between these organizations. There are, in particular, shared responsibilities between RFMOs, mainly WCPFC, IOTC, IATTC and CCSBT, which are addressed.

With respect to implementing management controls, providing monitoring data and scientific research, tasks are allocated, coordinated and monitored through WCPFC and its annual meetings. This system broadly works. Organizations and individuals involved in the management process in those cases limited to Contracting Parties will be well-defined for key areas.

Roles and responsibilities are not necessarily well understood in all areas, however. WCPFC has had a number of problems with flag states that have not applied appropriate controls to all their vessels, and it appears that not all vessels understand their responsibilities and is some cases there appear to be conflicts between requirements for confidentiality and the responsibilities to provide information necessary for management, which need to be resolved. This includes members not submitting timely data. The Regional Observer Programme (ROP), despite being overall successful, also has allegations of inappropriate behaviour towards observers on vessels, suggesting fishing entities do not fully understand or comply with their responsibilities. Although most data are available to the Secretariat of the Pacific Community (Oceanic Fisheries Programme), which is responsible for stock assessment, not all these data have been entered and made available to the Commission. While these problems are not in key areas in the sense that they do not prevent WCPFC completing its primary tasks, they nevertheless undermine its overall effectiveness and increase risks to sustainability. For example, while stock assessments provide estimates of stock status up to the current year, the Scientific Committee noted that the incomplete submission of data increases uncertainty in the assessments and encouraged all members to provide data in accordance with the WCPFC data rules. Hence although the fisheries meet the SG80, they do not meet SG100.

This PI would also have to be evaluated for each fishery. Overall, in this case the members (CCMs) are considered and for WCPFC their roles and responsibilities are clearly laid out and understood. This may not be true within nations and flag states for particular fisheries.

Inter-American Tropical Tuna Commission

IATTC is itself an organisation set up to define roles and responsibilities for its contracting parties and co-operating non-contracting parties.

Functions, roles and responsibilities are explicitly defined at the international level. The performance of the Secretariat is sound and well regarded as both efficient and effective by the Parties. The Parties themselves may vary in their ability to perform their role, but the roles and responsibilities are nevertheless explicitly defined at least at the national level for key areas. Key areas include providing catch and monitoring data to the Secretariat, taking part in various meetings sharing information and making decisions, meeting the requirements for conservation and other recommendations for IATTC and applying appropriate levels of control and surveillance.

IATTC is closely linked to the International Dolphin Conservation Program, which is a separate agreement specifically created to apply the “dolphin safe” label. There is clear differentiation between responsibilities, but co-operation increases the efficiency of both programs. For example, IDCP includes the objective “To ensure the long-term sustainability of the tuna stocks in the Agreement Area, as well as that of the marine resources related to this fishery, taking into consideration the interrelationship among species in the ecosystem, with special emphasis on, inter alia, avoiding, reducing and minimizing bycatch and discards of juvenile tunas and non-target

species." In addition, there are shared responsibilities between WCPFC and IATTC, which recognized the need to cooperate with one another to achieve conservation and management of stocks. There is a Memorandum of Understanding which clearly lays out the type and level of co-operation.

With respect to implementing management controls, providing monitoring data and scientific research, tasks are allocated, co-ordinated and monitored through IATTC and its annual meetings. This system broadly works. Organisations and individuals involved in the management process in those cases limited to Contracting Parties will be well-defined for key areas.

Roles and responsibilities are not necessarily well understood in all areas, however. IATTC has had a number of problems with flag states that have not applied appropriate controls to all their vessels, and it appears that not all vessels understand their responsibilities. This includes Flag States not submitting timely data and not in the correct form, and so on. Some problems in providing basic data on vessels and catches are likely due to a lack of understanding of requirements which appear to be complex or a lack of technical capacity in the responsible institutions. While these problems are not in key areas in the sense that they do not prevent IATTC completing its primary tasks, they nevertheless undermine its overall effectiveness and increase risks to sustainability. For example, stock assessments can only be completed up to the end of the available data series, which in these cases mean stock status estimates are generally a year behind the current year. Hence although the fisheries meet the SG80, they do not meet SG100.

3.1.2.b Consultation processes		
60 Guidepost	80 Guidepost	100 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.**

International Commission for the Conservation of Atlantic Tunas

Much of the purpose of ICCAT is to regularly seek data, particularly the data monitoring fishing activity and catches. ICCAT holds a plenary meeting every two years, and specialist working groups of ICCAT (comprising scientists from the contracting parties) convene technical meetings on an annual basis. Information derived from the CPCs and the inputs from the specialist working groups is considered and such consideration forms the basis of the management advice provided by ICCAT. "Local knowledge" at the international level is assumed to refer to national information and experience.

The management system demonstrates consideration of the information obtained. The scientific reports state exactly what information is being used, how it is used, and justification is provided for all information which is rejected. This is best practice and meets SG100. However, information used by management other than the scientific information is not so clearly reported. Although much of this information can be inferred from various sources, it is not necessarily clear how different sources of information are weighted. This includes information on compliance, economics and social issues. For example, the change in the West African seasonal closed area designed to reduce bycatch

of small bigeye tunas appears to have been made in 2004 without reference to scientific advice (Rec. 04-01 now replaced by Rec. 11-01). Although the intention is stated clearly in the recommendation, how the available information was used to reach this particular decision is unclear. The change in area caused the control to fail in its objective, which resulted in the recommendation being replaced again in 2008, but this time clearly based on a scientific evaluation (Rec. 08-01 now replaced by Rec. 10-01). Therefore, these fisheries do not meet SG100 because the management system cannot demonstrate in all cases consideration of all the information or explain how it uses information in decisions.

Indian Ocean Tuna Commission

Much of the purpose of IOTC is to regularly seek data, particularly the data monitoring fishing activity and catches. IOTC holds annual plenary meetings, and specialist working groups of IOTC (comprising scientists from the contracting parties) convene technical meetings on an annual basis. Information derived from the CPCs and the inputs from the specialist working groups is considered and such consideration forms the basis of the management advice provided by ICCAT. “Local knowledge” at the international level is assumed to refer to national information and experience.

The management system demonstrates consideration of the information obtained. The scientific reports state exactly what information is being used, how it is used, and justification is provided for all information which is rejected. This is best practice and meets SG100. However, information used by management other than the scientific information is not so clearly reported. Although much of this information can be inferred from various sources, it is not necessarily clear how different sources of information are weighted. This includes information on compliance, economics and social issues. Therefore, this does not meet SG100 because the management system cannot demonstrate in all cases consideration of all the information or explain how it uses information in decisions.

Western and Central Pacific Fishery Commission

WCPFC holds a meeting every year, after the annual meetings of the three specialist committees, which are the Scientific Committee, Technical and Compliance Committee, and the Northern Committee. The work of the Commission is assisted by a Finance and Administration Committee. Information derived from the members and the inputs from the specialist working groups is used by decision-makers and such consideration forms the basis for the decisions of the WCPFC. “Local knowledge” at the international level is assumed to refer to national information and experience.

The management system demonstrates consideration of the information obtained. The scientific reports state exactly what information is being used, how it is used, and justification is provided for all information which is rejected. This is best practice and meets SG100. However, information used by management other than the scientific information is not so clearly reported. Although much of this information can be inferred from various sources, it is not necessarily clear how different sources of information are weighted. This includes information on compliance, economics and social issues.

For example, WCPFC tuna management measures CMM-2008-01 and CMM-2010-05 attempt to restrict fishing effort and therefore fishing mortality on bigeye, yellowfin and albacore. However, limits are vague, and public information may not be available that clearly justifies the limits applied when the decision was made. They appear to be based on scientific advice with the aim of conserving stocks, and based on the precautionary principle. However, the lack of precision avoids the need to explain how the decision balances the needs of conservation with economic

development in the region, which would admittedly become complicated with so many stakeholders. Better practice for this might be to test various decision rules through simulation and choose one which meets the criteria developed from management policy. Evidence for this type of approach is not available for the main WCPFC management decisions. Therefore, these fisheries do not meet SG100 because the management system cannot demonstrate in all cases consideration of all the information or explain how it uses such information in decisions.

Inter-American Tropical Tuna Commission

IATTC holds a meeting every year, and specialist working groups (comprising scientists from the contracting parties) convene technical meetings on an annual basis. Information derived from the CPCs and the inputs from the specialist working groups is used by decision-makers and such consideration forms the basis of the management advice provided by IATTC. “Local knowledge” at the international level is assumed to refer to national information and experience.

The management system demonstrates consideration of the information obtained. The scientific reports state exactly what information is being used, how it is used, and justification is provided for all information which is rejected. This is best practice and meets SG100. However, information used by management other than the scientific information is not so clearly reported. Although much of this information can be inferred from various sources, it is not necessarily clear how different sources of information are weighted. This includes information on compliance, economics and social issues.

For example, IATTC tuna conservation resolution C-13-01 effectively restricts fishing effort and therefore fishing mortality on bigeye, yellowfin and skipjack. These have been evaluated and found effective in maintaining stocks are a level around MSY or above. However, limits are often vague, and public information may not be available that clearly justifies the limits applied when the decision was made. Better practice for this might be to test various decision rules through simulation and chose one which meets the criteria developed from management policy. Evidence for this type of approach is not available for the main IATTC management decisions. Therefore, these fisheries do not meet SG100 because the management system cannot demonstrate in all cases consideration of all the information or explain how it uses such information in decisions.

3.1.2.c Participation		
60 Guidepost	80 Guidepost	100 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.

International Commission for the Conservation of Atlantic Tunas

Consultation occurs at several levels within the management system. Consultation at the international level is formalized, and there are well-developed mechanisms for the seeking and

consideration of appropriate information. At the national and fishery level whether there is an opportunity for interested parties to be involved in management varies.

The opportunity to become Contracting Party or Co-operating Non-contracting Party is open to all, including non-states. ICCAT has taken and continues to take steps to encourage states to become Contracting Parties, and for Non-Contracting Parties to co-operate with ICCAT's conservation measures. The success is demonstrated by the increases in membership over the last decades and the high level of participation.

The Commission may be joined by any government that is a member of the United Nations (UN) and that is a member of a Specialized Agency of the United Nations. In addition, any inter-governmental economic integration organization constituted by States that have transferred to it competence over the matters governed by the ICCAT Convention, such as the EU. To become a Contracting Party, an instrument of adherence to the ICCAT Convention must be deposited with the Director-General of the Food and Agriculture Organization of the United Nations (FAO). Membership becomes effective on the date that the instrument is deposited. In addition, the Commission can also grant the special status of a Co-operator, who has many of the same rights and obligations that Contracting Parties have. The procedures and criteria for attaining this status are clearly laid out in a 2003 Recommendation.

An applicant for Cooperating non-Contracting Party, Entity or Fishing Entity Status is required to confirm its commitment to respect the Commission's conservation and management measures and inform ICCAT of the measures it takes to ensure compliance by its vessels with ICCAT conservation and management measures. It is important to note that the provision of information forms an important part of the decision to award this status. The Commission's Permanent Working Group for the Improvement of ICCAT Statistics and Conservation Measures (PWG) is responsible for reviewing requests for Cooperating Status and for recommending to the Commission whether or not an applicant should receive Cooperating Status. However, the requirements state that this provision should not allow over-capacity from elsewhere or legitimize IUU activity.

ICCAT facilitates effective engagement of its stakeholders. ICCAT also provides training and support to States lacking the capacity in areas of data management and fisheries science, which facilitates effective and full involvement in its activities.

Therefore, there is sufficient evidence that, at the international level, ICCAT meets SG80 and SG100.

Indian Ocean Tuna Commission

Consultation occurs at several levels within the management system. Consultation at the international level is formalized, and there are well-developed mechanisms for the seeking of and consideration of appropriate information. At the national and fishery level whether there is an opportunity for interested parties to be involved in management may vary and will need to be taken into account in each case.

The Commission may be joined by any government that is a member of the United Nations (UN). In addition, any inter-governmental economic integration organization constituted by States that have transferred to it competence over the matters governed by the Convention, such as the EU, may also become a member. To become a Contracting Party, an instrument of adherence to the Convention must be deposited with the Director-General of the Food and Agriculture Organization of the United Nations (FAO). The procedures and criteria for attaining this status are clearly laid out. Important exceptions apply to states which are not members of the UN. A non-governmental organization representing the fishing interests of Taiwan Province of China has been invited to participate in IOTC meetings, which affords an opportunity and encouragement for Chinese Taipei to be involved as an affected party.

IOTC facilitates effective engagement of its stakeholders. IOTC also provides training and support to States lacking the capacity in areas of data management and fisheries science, which facilitates effective and full involvement in its activities.

Therefore, there is sufficient evidence that, at the international level, IOTC meets SG80 and SG100.

Western and Central Pacific Fishery Commission

Consultation occurs at several levels within the management system. Consultation at the international level is formalised, and there are well-developed mechanisms for the seeking and using appropriate information. At the national and fishery level whether there is an opportunity for interested parties to be involved in management would need to be evaluated.

The opportunity to become Member or Co-operating Non-member is open to all. The membership of relevant nations is high and there is a high level of participation. In particular, the small island nations are well represented through the Pacific Islands Forum Fisheries Agency.

The Commission may be joined by any government or international organization that can also be a signatory to the United Nations Convention on the Law of the Sea (1982) and that has a fishing interest in the area. Interested NGOs have an opportunity to observe at meetings, with requirements that are not overly onerous.

The Commission includes 25 small island developing states and territories for which special provision is made through the Convention text and Resolution 2008-01. In addition, there are a number of initiatives to develop the capacity of relevant nations to meet their responsibilities and fully participate in the management system. These activities of WCPFC are supported through the Special Requirements Fund (SRF) was established for the purposes identified in the Convention Article 30: recognition of the special requirements of developing States. There is also a joint UNDP-WCPFC project with important East Asian nations developing capacity for the collection of fishery data. This includes capacity to collect, maintain and analyse relevant data, and hence participate in, and contribute to WCPFC activities.

A number of stocks and fisheries are shared with IOTC, IATTC and CCSBT. There are memoranda of understanding (MOU) that governs the co-operation between these RFMOs. The MOUs establish and maintain consultation, cooperation and collaboration in respect of matters of common interest including the exchange of data and information, scientific research (including Pacific-wide stock assessments) and conservation and management measures for fleets, stocks and species of mutual interest. The Secretariats often have representatives at each other's meetings, as well as specific consultative meetings where appropriate.

Therefore, there is sufficient evidence that, at the international level, WCPFC meets SG80 and SG100. In addition, a fishery will need to demonstrate similar representative links from grass-roots to national level and attendance at WCPFC meetings. Lack of consultation, the opportunity for consultation or encouragement to take those opportunities within a particular fishery could prevent the fishery meeting SG80 or SG100.

Inter-American Tropical Tuna Commission

Consultation occurs at several levels within the management system. Consultation at the international level is formalised, and there are well-developed mechanisms for the seeking and using appropriate information. At the national and fishery level whether there is an opportunity for interested parties to be involved in management would need to be evaluated.

The opportunity to become Contracting Party or Co-operating Non-contracting Party is open to all, including non-states. There are in 2014 four Co-operating Non-contracting Party. The membership has increased over the last decades and there is a high level of participation.

The Commission may be joined by any government that is a member of the United Nations (UN) and that is a member of a Specialized Agency of the United Nations. In addition, any inter-governmental economic integration organization constituted by States that have transferred to it competence over the matters governed by the IATTC Convention, such as the EU. The signed convention is held in Washington, USA. The Convention is open to accession by any State or regional economic integration organization (e.g. EU) that had already acceded to the previous 1949 Convention, has coastline in the Convention Area, has vessels fishing stocks covered by this Convention or is invited to accede on the basis of a decision by the Parties. Interested NGOs have an opportunity to observe at meetings, with requirements that are not overly onerous.

A special fund has been established, which is administered by the IATTC has been created for strengthening the institutional capacity of developing countries for the sustain-able development of fisheries for highly migratory species (Resolution C-14-03). The fund is used to develop technical and scientific capacity in developing countries so that they can comply with their obligations under the Antigua Convention. This includes capacity to collect, maintain and analyse relevant data, and to participate in all IATTC meetings.

A number of stocks are shared with WCPFC. There is a memorandum of understanding (MOU) that governs the co-operation between the two RFMOs. The MOU establishes and maintains consultation, cooperation and collaboration in respect of matters of common interest including the exchange of data and information, scientific research (including Pacific-wide stock assessments) and conservation and management measures for stocks and species of mutual interest. The Secretariats have representatives at each other's meetings where appropriate, as well as a specific WCPFC-IATTC consultative meeting. There is also an agreement over the endorsement of regional high-seas observers.

Therefore, there is sufficient evidence that, at the international level, IATTC meets SG80 and SG100. In addition, a fishery will need to demonstrate similar representative links from grass-roots to national level and attendance at IATTC meetings. Lack of consultation, the opportunity for consultation or encouragement to take those opportunities within a particular fishery could prevent the fishery meeting SG80 or SG100.

Scoring for 3.1.2

International Commission for the Conservation of Atlantic Tunas: All SG60 and 2 out of 3 SG80 are met. 75

Indian Ocean Tuna Commission: All SG60 and 2 out of 3 SG80 are met. 75

Western and Central Pacific Fishery Commission: All SG60 and SG80 are met, and 1 out of 3 SG100 are met. 85

Inter-American Tropical Tuna Commission: All SG60 and SG80 are met, and 1 out of 3 SG100 are met. 85

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3.1.3 Longterm objectives: The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.

3.1.3.a Objectives		
60 Guidepost	80 Guidepost	100 Guidepost
Long term objectives to guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are **implicit** within management policy.	**Clear** long term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are **explicit** within management policy.	**Clear** long term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are **explicit** within **and required by** management policy

International Commission for the Conservation of Atlantic Tunas

The ICCAT Basic Texts provide clear, long-term objectives that guide decision making under Principle 1. The long-term objectives for each stock are clear enough that the science-based advice and management of these stocks can be evaluated.

The ICCAT Convention has no explicit provision regarding the precautionary approach or ecosystem based management which forms part of the MSC Principles and Criteria. There is evidence that these principles are being applied in fisheries management, but they remain implicit.

Evidence of applying the precautionary approach and ecosystem based management include bycatch reduction programs, monitoring of ecosystem indicators and precautionary management measures. The ecosystem approach is not explicit, but underpins the reason for many ICCAT activities. ICCAT has undertaken the collection of data on bycatch, including seabirds and sharks, research on biological and physical oceanography. In addition, ICCAT has banned the use of high-seas driftnets and shark finning, encouraged the live release of billfish and juvenile bluefin tuna and encouraged the use of circle hooks to reduce sea turtle mortalities, all of which imply the precautionary and ecosystem approaches to management. ICCAT has also formed a committee on Ecosystem Monitoring. However, being implicit has allowed considerable leeway to some CPCs who do not appear to take some of these aspects of management seriously.

The lack of explicit objectives incorporating the precautionary approach and ecosystem-based management has created weaknesses in the policy. It has been demonstrated that the policy can in the short to medium term depart from stated broad objectives within ICCAT, and has led to, at best interpretation, non-precautionary actions and delays to implementing provisions required to meet the MSC Principles and Criteria.

Indian Ocean Tuna Commission

The objective of the IOTC is “to promote cooperation among its Members with a view to ensuring, through appropriate management, the conservation and optimum utilisation of stocks covered by this Agreement and encouraging sustainable development of fisheries based on such stocks.” In addition, Resolution 12-01 states that IOTC shall “… 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." and "In applying the precautionary approach, the Commission shall adopt, after due consideration of the advice supplied by the IOTC Scientific Committee, stock-specific reference points … and associated harvest control rules …". As this resolution, which is consistent with the MSC standard, makes these general objectives explicit and required by management, SG80 and, ostensibly SG100, are met. However, despite this, there is less evidence for the implementation of the precautionary approach in practice for some stocks, notably albacore and yellowfin. Management has not taken precautionary action despite these stocks being at risk, and adopted provisional limits and targets do not appear to account for uncertainties. A lack of evidence that the precautionary approach is being applied across all policy prevents SG100 being met,

Western and Central Pacific Fishery Commission

The WCPFC Convention provides clear, long-term objectives that guide decision making under Principle 1. The long-term objectives for each stock are clear enough that the science-based advice and management of these stocks can be evaluated. The WCPFC Convention has an explicit provision regarding the precautionary approach and ecosystem based management which forms part of the MSC Principles and Criteria

Protection for all resources within the same ecosystem is provided for, consistent with Principle 2. The overall objective of the Convention is stated in Article 2 as "The objective of this Convention is to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific Ocean in accordance with the 1982 Convention and the Agreement." Much more detail is provided under Articles 5-8, which provides the principles which should be used in making decisions and therefore defines the objectives very clearly. This includes measures to protect all species belonging to the same ecosystem as the target stocks, to reduce bycatch, develop more "environmentally safe" fishing gears and apply the precautionary approach, all of which meet requirements under Principle 2.

The overall objectives are well enough defined that the level of risk that the Commission is taking can be assessed externally from the available information. Whether, in the view of an independent body, this is consistent with the precautionary approach as required by its own Convention can be determined. Note that the members are required to apply the precautionary approach rather than the Commission, but this should make little difference in practice.

While it appears to be a requirement, in practice it is less clear that the precautionary approach is applied in practice over all policy. Stock assessments in 2010, 2011 and 2014 indicate that bigeye fishing mortality exceeded levels consistent with MSY. While precautionary reference points have been set, there has not been a corresponding precautionary action that has reduced exploitation levels.

Overall, clear explicit objectives incorporating the precautionary approach and ecosystem-based management in the policy meet the MSC Principles and Criteria, and defined, meeting SG80. However, it is not yet clear that the precautionary approach is applied in practice across all policy for all stocks, so SG100 is not met.

Inter-American Tropical Tuna Commission

The IATTC Convention provides clear, long-term objectives that guide decision making under Principle 1. The long-term objectives for each stock are clear enough that the science-based advice and management of these stocks can be evaluated. The IATTC Convention has an explicit provision

regarding the precautionary approach and ecosystem based management which forms part of the MSC Principles and Criteria. Objectives with respect to ETP species are also provided by the IATTC Convention and more directly by the AIDCP.

Protection for all resources within the same ecosystem is provided for, consistent with Principle 2. In Article VII paragraph 1, the functions of the Commission provide for measures to protect all species belonging to the same ecosystem as the target stocks, to reduce bycatch (specifically co-ordinate with the AIDCP), develop more "environmentally safe" fishing gears and apply the precautionary approach, all of which meet requirements under Principle 2. In addition, the Convention explicitly requires that the Commission promote the application of the provisions under the FAO Code of Conduct, which includes the ecosystem approach to fisheries management as well as many of the same requirements as the MSC P&C.

This may not mean that short-term decisions are always consistent with the long term objectives considered here. For example, scientific staff have implied that stricter controls on the bigeye fishery than those adopted by Commission may be preferred to be consistent with the precautionary approach. However, the level of risk that the Commission is taking can be assessed externally from the available information. Whether, in the view of an independent body, this is consistent with the precautionary approach as required by its own Convention can be determined. Information apart from the scientific advice which the Commission may use in making its decision is not necessarily available. This potential lack of transparency is considered under PI 3.1.2 and 3.2.2.

Although the precautionary approach is in the Convention, it is less clear that it is applied in all policy. Reference points for bigeye do not appear to be particularly precautionary when taking into account significant uncertainties (although there may be evidence to support the values used), and precautionary action has not been taken to prevent the bigeye stock declining to current levels. In practice, there is no clear link between the convention and practical implementation of policy in all fisheries.

Overall, clear explicit objectives incorporating the precautionary approach and ecosystem-based management in the policy meet the MSC Principles and Criteria, and therefore SG80. It is not clear that the precautionary approach is a requirement across all areas of policy, so SG100 is not met.

Scoring for 3.1.3

International Commission for the Conservation of Atlantic Tunas: All SG60, but no SG80, are met. 60

Indian Ocean Tuna Commission: All SG60 and SG80, but no SG100, are met. 80

Western and Central Pacific Fishery Commission: All SG60 and SG80, but no SG100, are met. 80

Inter-American Tropical Tuna Commission: All SG60, SG80 and SG100 are met. 100

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3.2 Fishery Specific Management System

3.2.1 Fishery-specific objectives: The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.

3.2.1.a Objectives		
60 Guidepost	80 Guidepost	100 Guidepost
Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **implicit** within the fishery-specific management system.	**Short and long term objectives,** which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.	**Well defined and measurable short and long term objectives**, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.

International Commission for the Conservation of Atlantic Tunas

The ICCAT basic texts offers guidance and principles on which management plans might be based.

There is a "Convention Objective" applied to all stocks, which is to maintain them at their most productive. This has led to setting total catches and fishing capacity to take stock abundance to above BMSY. Specific fishery objectives are in the form of the annual TAC and quota allocations for bigeye, yellowfin and albacore, but not skipjack. These are issued by ICCAT and agreed by its membership.

The objective is to maintain stocks above BMSY while fishing at less than FMSY. The amount of precaution applied, however, is not defined. Decisions appear to be based on the median estimates of the values of interest. This would imply a target stock size with 50-60% chance being above MSY level. Note that there is no explicit consideration of the information requirements for reducing risk.

No TAC or quota is set for skipjack because the stock is considered to be under-exploited (this is not considered best practice, and is addressed under P1). However, the same management objective applies to this stock.

However, objectives apart from MSY are not well defined and therefore not measurable. There is no explicit consideration of risks (for example, precautionary approach) and no explicit consideration of ecosystem-based management.

The scientific advice is based on MSC Principles 1 and 2, because these objectives are implicit in the management of each stock, meeting SG60. However, specific objectives consistent with the requirements of MSC Principles 1 and 2 are not stated explicitly, so SG80 cannot be met.

Indian Ocean Tuna Commission

The IOTC basic texts offers guidance and principles on which management plans might be based. The management objective is to achieve MSY. The allocation negotiations are designed to proportion access and catches such that MSY and F_{MSY} are not exceeded. Although the foundation for specific

objectives has been established (see PI 3.1.3), specific objectives for each tuna fishery have not been developed yet.

The amount of precaution to be applied is not well defined. Currently, decisions appear to be based on the median estimates of the values of interest. In the most recent Scientific Report, however, probability statements and “Kobe” plots are used to communicate risk. However, objectives apart from MSY are not well defined and therefore not measurable. There are no explicit objectives or constraints on risk or for ecosystem-based management. Capacity building among CPC representatives could help develop specific objectives for many fisheries.

The scientific advice is based on MSC Principles 1 and 2, because these objectives are implicit in the management of each stock, meeting SG60. However, specific objectives consistent with the requirements of MSC Principles 1 and 2 are not stated explicitly, so SG80 cannot be met. For the IOTC fisheries SG60 is met, but not SG80.

Western and Central Pacific Fishery Commission

The WCPFC Convention offers guidance and principles on which management plans might be based. This includes objectives which not only apply to target stocks, but also the ecosystem. However, these principles are relatively general and covered under PI 3.1.3. These objectives have been used in developing scientific advice.

Each conservation measure has an objective, which can be inferred or is stated explicitly as in the case of bigeye. Bigeye and yellowfin are considered together since they are generally caught at the same time both by purse seine and longline. The CMM 2008-01 objectives are clearly defined and focused on bigeye which is the limiting factor in this fishery. The CMM aims to achieve a 30% reduction in bigeye fishing mortality. More generally, the CMM objectives are to maintain stocks at MSY, as qualified by relevant unspecified environmental and economic factors. It should be noted that although the measures adopted have not been effective and are under review, the objectives are stated clearly enough that such an evaluation is possible.

The objectives are not stated explicitly, but easily inferred from the text. The CMM-2010-05 for South Pacific albacore states that fishing effort should not be increased “in the Convention Area south of 20°S above current 2005 levels or recent historical (2000-2004) levels.”. However, in this case the stock is in good condition, so risks to the fishery, should this general objective be met, are very low. Similarly, provisions for swordfish (CMM-2009-03) and other species are designed to maintain current exploitation with the objective for sustainable use, but do not address fisheries development. For CMM addressing bycatch, such as turtles (CMM-2008-03), the objective is to minimize bycatch in the relevant fisheries and return live bycatch if possible alive. These objectives would need to be assessed through the regional observer program.

Because the conservation measures contain reasonably explicit and specific intentions and objectives, and also allow for evaluation of the performance against these objectives, the fisheries meet SG80.

However, although broadly measurable, they are not necessarily well-defined particularly in relation to achieving MSC P&C, with the possible exception of bigeye. Objectives may be somewhat vague with respect to determining precise status using reference points, for example, and allowing for unspecified qualifications. Certain resolutions and conservation measures might be presumed to achieve MSC objectives, but it is not certain. A higher score might be possible should WCPFC develop reference points directly linked to proscribed management action, as would be applied through a harvest control rule, for example. This would need to be evaluated for each specific fishery when undergoing MSC assessment.

The scientific advice is based on MSC Principles 1 and 2, because these objectives are implicit in the management of each stock, meeting SG60. In addition, effectively explicit objectives are provided through the conservation and management measures. In most cases, this should meet SG80. However, with the qualifications, it may not be possible to determine whether these are consistent with the requirements of MSC Principles 1 and 2, since they are related to the conservation measure itself rather than the stocks, species or ecosystem. Therefore SG100 cannot be met.

Inter-American Tropical Tuna Commission

The IATTC Convention offers guidance and principles on which management plans might be based. This includes objectives which not only apply to target stocks, but also the ecosystem. However, these objectives are relatively general and covered under PI 3.1.3. These objectives have been used in developing scientific advice.

There is a long term management plan to limit fishing capacity to sustainable levels. Objectives are clearly laid out and are measurable for purse seine at least. IATTC now has a closed vessel registry which should help prevent increases in capacity, if not reduce it.

Each conservation measure has an objective which is clearly stated, although in one case has not been easy to interpret (”Current levels” of effort specified in Resolution C-05-02 for albacore is not defined and effort is not routinely measured, although steps are being taken to resolve this in C-13-03). Otherwise, because the conservation measures contain explicit and specific intentions and objectives, and also allow for monitoring of the performance against these objectives, the fisheries meet SG80.

However, although broadly measurable, they are not necessarily well-defined particularly in relation to achieving MSC P&C. Stock assessments are not available for all species (e.g. skipjack), and proxies for MSY have not been determined. Therefore, objectives may be somewhat vague with respect to determining precise status using reference points, for example. Certain resolutions and conservation measures might be presumed to achieve MSC objectives, but it is not certain. This would need to be evaluated for each specific fishery when undergoing MSC assessment.

The scientific advice is based on MSC Principles 1 and 2, because these objectives are implicit in the management of each stock, meeting SG60. In addition, explicit objectives are provided through the resolutions and recommendations, which determine the aim and intention of the conservation measures. In most cases, this meets SG80. However, these objectives are not stock specific and often cannot be determined to be entirely consistent with the requirements of MSC Principles 1 and 2, since they are related to the conservation measure rather than the stocks or species. Therefore SG100 cannot be met.

Scoring for 3.2.1

International Commission for the Conservation of Atlantic Tunas: All SG60, but no SG80, are met. 60

Indian Ocean Tuna Commission: All SG60, but no SG80, are met. 60

Western and Central Pacific Fishery Commission: All SG60 and SG80, but no SG100, are met. 80

Inter-American Tropical Tuna Commission: All SG60 and SG80, but no SG100, are met. 80

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3.2.2 Decision-making processes: 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.

3.2.2.a Decision-making processes		
60 Guidepost	80 Guidepost	100 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.	

International Commission for the Conservation of Atlantic Tunas

Decision-making processes are in place, which are established, responsive and largely transparent. However, there are some weaknesses, which have been highlighted by the performance review.

Members can vote, but cooperating non-members are not entitled to take part in voting. For example, Chinese Taipei is a Co-operating Fishing Entity and has observer status only. Many decisions are obtained from consensus rather than majority voting.

ICCAT allows its parties to opt out of decisions. The 2006 UNFSA Review Conference recommended that States through RFMOs should ensure that post opt-out behaviour is constrained by rules to prevent opting-out parties from undermining conservation, clear processes for dispute resolution, and a description of alternative measures that will be implemented in the interim (UN, 2006, paragraph 32(f) of the Annex). ICCAT has not implemented these yet.

Despite this, decision-making processes are in place, and they do generally result in measures and strategies to achieve objectives, which meet SG80. The result of the decision-making is primarily addressed in Principle 1 (PI 1.1.1, 1.2.1, 1.2.2) and elsewhere.

Indian Ocean Tuna Commission

Decision-making processes are in place, which are established, responsive and largely transparent. However, there are some weaknesses, which have been highlighted by the performance review.

Members can vote, but cooperating non-members are not entitled to take part in voting. Many decisions are obtained from consensus rather than majority voting.

IOTC allows its parties to opt out of decisions. The 2006 UNFSA Review Conference recommended that States through RFMOs should ensure that post opt-out behaviour is constrained by rules to prevent opting-out parties from undermining conservation, clear processes for dispute resolution, and a description of alternative measures that will be implemented in the interim (UN, 2006, paragraph 32(f) of the Annex). IOTC has not implemented these yet, but it has yet to be an issue. There has been a recent opt-out of resolutions, which may lead to improvements.

Despite this, decision-making processes are in place, and they do generally result in measures and strategies to achieve objectives, which meet SG80.

Western and Central Pacific Fishery Commission

Decision-making processes are in place, which are established, responsive and largely transparent. These are very clearly defined in the Convention (Article 20) and Rules of Procedure. Information used for decision-making is published. Decisions are made by consensus and if necessary by voting (75% majority) and such decisions are binding on members. There is no opting out procedure, but members may require an independent review of a decision to ensure it is consistent with the Convention and management objectives. Some decisions, such as the allocation of fishing rights, must be carried out using consensus. Conservation and Management Measures are binding, but resolutions are non-binding. All management measures apply equally inside EEZ and on high seas. Flag states enforce management measures on their own vessels and coastal states within their own EEZ.

Decision-making processes are in place, and they result in measures and strategies to achieve objectives, which meet SG80. The result of the decision-making is primarily addressed elsewhere (PI 1.1.1, 1.2.1, 1.2.2).

Inter-American Tropical Tuna Commission

Decision-making processes are in place, which are established, responsive and largely transparent. Information used for decision-making is published. Decisions are made by consensus and there is no objection or opting out procedure. Resolutions are binding, but recommendations are non-binding. All management measures apply equally inside EEZ and on high seas. Parties enforce management measures within their own EEZ.

IATTC requires that decisions are made through consensus; therefore members can in theory veto resolutions. Members can vote, but cooperating non-members are not entitled to take part in voting. While there is no evidence that a lack of consensus has prevented necessary conservation measures being adopted, it is possible that the requirement for consensus slows up decisions while protracted negotiations may take place. Various issues, for example, such as convening a technical working group to resolve the definition of “current effort” in C-05-02 and in convening a performance review, could be due to a lack of consensus.

Despite this, decision-making processes are in place, and they do generally result in measures and strategies to achieve objectives, which meet SG80. The result of the decision-making is primarily addressed elsewhere (PI 1.1.1, 1.2.1, 1.2.2).

3.2.2.b Responsiveness of decision-making processes		
60 Guidepost	80 Guidepost	100 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.

International Commission for the Conservation of Atlantic Tunas

Article VIII of the Basic Texts sets out the procedure for dealing with recommendations, which should be made on the basis of scientific evidence and be designed to maintain tuna populations at levels that will permit the maximum sustainable catch. Recommendations may be made at the initiative of the Commission or by an appropriate Panel established with the approval of at least two-thirds of all the Contracting Parties. However, ICCAT (as well as NAFO, CCAMLR, NEAFC and SEAFO) permits a member to submit an objection, which can allow an objector to opt out of the recommendation. This follows a well-defined procedure.

If a CPC persists in objecting to a conservation recommendation, the recommendation will not be binding on that contracting party. The contracting party is not required to justify its objection and there are no limits placed upon when an objection might be acceptable or not. Under best practice, permissible reasons would be limited to any alleged incompatibility with the LOS Convention, UNFSA or the RFMO's constitutive texts, or alleged discrimination against the member concerned that cannot be justified. It is therefore currently possible that an objection in ICCAT could be incompatible with the MSC Principles and Criteria. A unilateral claim to increase or create a quota, for example, is incompatible with the object and purpose of ICCAT and undermines the conservation measures. Solutions such as the CPC seeking a review by an independent panel of the recommendation it is objecting to, as used by CCAMLR and WCPFC for example, is not available in ICCAT.

While the objections procedure is a weakness, it does not appear in practice to have been deleterious to the decision-making processes for the stocks considered here. Objections have been used primarily in response to quota allocation schemes. Eastern Atlantic bluefin tuna, which is outside the scope of this report, may not meet the SG60, since the objections procedure has undermined decisions on conservation in this case. The fact that such objections may unduly delay the resolution of disputes is addressed in PI 3.1.1.

The decision-making is transparent. ICCAT resolves most disputes at its annual meetings by consensus. While the outcome of such decisions is transparent and, we presume, initial positions and the information used for the basis of the decision is available, exactly how a decision is reached is not necessarily obvious. However, this degree of transparency is adequate to show a gross mis-match between the information being provided and the decision being made. The system makes sure that all members are fully informed of the issues under consideration and are able to participate in informed decision-making. The annual calendar of meetings is crowded, with inter-sessional meetings of various scientific, compliance and technical sub-committees, so decision-

making could become unclear. This may be an issue particularly for developing countries, whose capacity to attend and participate in meetings of technical committees is likely to be limited. For this reason, ICCAT ensures that final decisions and the adoption of management recommendations may be made only in plenary at the annual meeting.

The decision-making is adaptive in that decisions are evaluated by the various specialist meetings and feedback is provided to the Commission. The Commission can be shown to react appropriately. For example, following an evaluation in 2008 of the time-area closure intended to reduce the catch of undersize bigeye, appropriate adjustments were made by the Commission ([Rec 04-01] was replaced by [Rec 08-01]).

Overall the decision-making is adequate for the stocks being considered. It can be shown that it deals with serious and important issues in a transparent, timely and adaptive manner meeting SG80. It cannot be claimed that the decision-making deals with all issues. The objections process probably stops contentious issues from being raised wherever possible and therefore these may remain unresolved. Therefore the fishery does not meet SG100.

Indian Ocean Tuna Commission

The Rules of Procedure set mechanisms for dealing with resolutions, which should be made on the basis of scientific evidence and be designed to maintain tuna populations at levels that will permit optimum utilization. Resolutions may be made at the initiative of the CPC to the Commission.

If a CPC persists in objecting to a conservation measure, the recommendation will not be binding on that contracting party. The contracting party is not required to justify its objection and there are no limits placed upon when an objection might be acceptable or not. Under best practice, permissible reasons would be limited to any alleged incompatibility with the LOS Convention, UNFSA or the RFMO's constitutive texts, or alleged discrimination against the member concerned that cannot be justified. It is therefore currently possible that an objection in IOTC could be incompatible with the MSC Principles and Criteria. A unilateral claim to increase or create a quota, for example, is incompatible with the object and purpose of IOTC and could undermine a conservation measure. Solutions such as the CPC seeking a review by an independent panel of the recommendation it is objecting to, as used by CCAMLR and WCPFC for example, are not available.

Objections have not as of yet appear in practice to be deleterious to the decision-making processes for the stocks considered here. For the first time, objections were submitted for resolutions 13/01, 13/02, 13/03, 13/06 and 13/07, because the country believed that its vessels did not have the capacity to meet these reporting requirements, but is most likely a statement to indicate that any non-compliance is not because the CPC does not wish to comply.

The decision-making is transparent. IOTC resolves most disputes at its annual meetings by consensus. While the outcome of such decisions is transparent and, we presume, initial positions and the information used for the basis of the decision is available, exactly how a decision is reached is not necessarily obvious. However, this degree of transparency is adequate to show a gross mismatch between the information being provided and the decision being made. The system makes sure that all members are fully informed of the issues under consideration and are able to participate in informed decision-making. The annual calendar of meetings is crowded, with inter-sessional meetings of various scientific, compliance and technical sub-committees, so decision-making could become unclear. This may be an issue particularly for developing countries, whose capacity to attend and participate in meetings of technical committees is likely to be limited.

Overall the decision-making is adequate for the stocks being considered. It can be shown that it deals with serious and important issues in a transparent, timely and adaptive manner meeting SG80. It cannot be claimed that the decision-making deals with all issues. The objections process probably

stops contentious issues from being raised wherever possible and therefore these may not be resolved. Therefore the fishery does not meet SG100.

Western and Central Pacific Fishery Commission

Each member has one vote (Rules of Procedure Rule 21). All decisions and other official actions of the Commission are taken by consensus or 75% majority vote of all of the Convention members (Rule 22). Some decisions require consensus, but these are not those on which sustainability of the fishery depends. The majority voting system has not yet had to be invoked.

The decision-making is transparent and transparency is a requirement of the Convention (Article 21). WCPFC ostensibly resolves most disputes at its annual meetings by consensus. While the outcome of such decisions is transparent as it is published as a resolution from the annual meetings, and initial positions and the information used for the basis of the decision is available (as technical reports provided to the meeting or as proposals for resolutions from some Parties), exactly how a decision is reached is not necessarily obvious. However, this degree of transparency is adequate to show a mis-match between the information being provided and the decision being made. Much of the discussion at the meeting is also reported. The system makes sure that all Commission members are fully informed of the issues under consideration and are able to participate in informed decision-making.

The decision-making is adaptive in that decisions are evaluated by the various specialist meetings and feedback is provided to the Commission. The Commission can be shown to react appropriately. Whether this will always be timely is less clear, but, given the international context, response times are probably “best practice”.

Overall the decision-making is adequate for the stocks being considered. It can be shown that it deals with serious and important issues in a transparent, timely and adaptive manner meeting SG80. The decision-making processors appear to address all issues but not successfully in all cases, and therefore the fishery does not meet SG100.

Inter-American Tropical Tuna Commission

The each national section has one vote (Rules of Procedure Rule III). All decisions, resolutions, recommendations, and other official actions of the Commission are taken only by a unanimous vote of all of the High Contracting Parties to the Convention (Rule IV). This allows some activities of the Commission to be blocked. In practice, this probably results in delays while a compromise is reached.

Consultation includes trying to ensure participants are aware of their responsibilities. Training workshops are provided to captains authorized to fish in IATTC waters. Meetings in 2012 include AIDCP Seminars for fishermen and an ETP Captain's Training Workshop, which are required for inclusion in the list of qualified captains.

The decision-making is transparent. IATTC ostensibly resolves most disputes at its annual meetings by consensus. While the outcome of such decisions is transparent as it is published as a resolution from the annual meetings, and initial positions and the information used for the basis of the decision is available (as technical reports provided to the meeting or as proposals for resolutions from some Parties), exactly how a decision is reached is not necessarily obvious. However, this degree of transparency is adequate to show any mis-match between the information being provided and the decision being made. The system makes sure that all Commission members are fully informed of the issues under consideration and are able to participate in informed decision-making.

The decision-making is adaptive in that decisions are evaluated by the various specialist meetings and feedback is provided to the Commission. The Commission can be shown to react appropriately. Whether this will always be timely is less clear. With a requirement for consensus such decisions might be delayed to the extent of endangering a stock or fishery. However, no such delay has so far been observed.

Overall the decision-making is adequate for the stocks being considered. It can be shown that it deals with serious and important issues in a transparent, timely and adaptive manner meeting SG80. It cannot be claimed that the decision-making deals with all issues. The decision-making process requiring consensus probably stops contentious issues from being raised wherever possible and therefore these may not be resolved. Therefore the fishery does not meet SG100.

3.2.2.c Use of precautionary approach		
60 Guidepost	80 Guidepost	100 Guidepost
	Decision-making processes use the precautionary approach and are based on best available information.	

International Commission for the Conservation of Atlantic Tunas

Decision-making processes clearly attempt to use the best available information. A large number of meetings are conducted and reports written for the Commission which provide analyses and advice based on all the available information.

Although the precautionary approach is implicit rather than explicit in decision making processes, it can be demonstrated that it is used in practice under most circumstances. For example, various recommendations and resolutions have been made on the basis of the potential harm they might do, and have not been delayed while waiting for relevant research to be conducted. However, because the precautionary approach and its use are not defined explicitly, it is difficult to determine whether it is properly used in all decisions. This weakness is recognized and being addressed.

Overall, ICCAT decision-making processes meet SG80. They are based on the best available information, and in most cases can be shown to be based on the precautionary approach. Importantly, there is now a clear intention to include the precautionary approach explicitly in its basic texts, which should clarify its use and ensure reference to it in giving explanations for decisions.

Indian Ocean Tuna Commission

Decision-making processes clearly attempt to use the best available information. A large number of meetings are conducted and reports written for the Commission which provide analyses and advice based on all the available information.

Although the precautionary approach is implicit rather than explicit in decision making processes, it can be demonstrated that it is used in practice under most circumstances. For example, various recommendations and resolutions have been made on the basis of the potential harm they might do, and have not been delayed while waiting for relevant research to be conducted. However,

because the precautionary approach and its use are not defined explicitly, it is difficult to determine whether it is properly used in all decisions. This weakness is recognized and being addressed.

Overall, IOTC decision-making processes meet SG80. They are based on the best available information, and in most cases can be shown to be based on the precautionary approach. Importantly, there is now a clear intention to include the precautionary approach explicitly in its basic texts, which should clarify its use and ensure reference to it in giving explanations for decisions.

Western and Central Pacific Fishery Commission

The WCPFC Convention requires that the members of the Commission, directly and through the Commission, apply the precautionary approach, as described in Article 6 and Annex II. Specifically, the Convention requires that Commission be more cautious when information is uncertain, unreliable or inadequate and does not use the absence of adequate scientific information as a reason for postponing or failing to take conservation and management measures. In addition, the Convention proposes that cautious conservation and management measures are applied to exploratory fisheries until there are sufficient data to allow stock assessment as well as to fisheries adversely affected by natural phenomenon on an emergency basis. In all cases, decisions are required to be based on the best scientific information available, and the Commission makes adequate provision for this to be achieved.

Evidence that WCPFC is attempting to apply the precautionary approach is found in the limitations on expansion of various fisheries, such as Southern Pacific Albacore, pending further development of management plans. Evidence of an ability to apply precaution is much less clear in the bigeye fishery, where bycatch issues are preventing the fishery meeting its targets.

Overall, WCPFC decision-making processes are based on the best available information and the precautionary approach, meeting SG80.

Inter-American Tropical Tuna Commission

The IATTC Antigua Convention requires that the members of the Commission, directly and through the Commission, apply the precautionary approach, as described in the relevant provisions of the Code of Conduct and/or the 1995 UN Fish Stocks Agreement, for the conservation, management and sustainable use of fish stocks. Specifically, the Convention requires that Commission be more cautious when information is uncertain, unreliable or inadequate and does not use the absence of adequate scientific information as a reason for postponing or failing to take conservation and management measures.

Article VII of the Convention requires that the Commission adopts measures that are based on the best scientific evidence available to ensure the long-term conservation and sustainable use of the fish stocks covered by this Convention. The Commission is also tasked to determine whether, according to the best scientific information available, a specific fish stock covered by this Convention is fully fished or overfished and, on this basis, whether an increase in fishing capacity and/or the level of fishing effort would threaten the conservation of that stock.

This requirement to use the best scientific information available is clearly implemented. There is evidence from the large number of meetings that have been conducted and reports written for the Commission which provide analyses and advice based on all the available information.

Overall, IATTC decision-making processes are based on the best available information and the precautionary approach, meeting SG80.

3.2.2.d Accountability and transparency of management system and decision making process		
60 Guidepost	80 Guidepost	100 Guidepost
Some information on the fishery's performance and management action is generally available on request to stakeholders	**Information on the fishery's performance and management action is available on request**, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring evaluation and review activity.	Formal reporting to all interested stakeholders **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.

International Commission for the Conservation of Atlantic Tunas

Recommendations from research, monitoring, evaluation and performance review are published formally. Likewise, reports of the plenary sessions of meetings are published formally and are publicly available. This formal reporting represents best practice. While some groups may believe that how all information is used in the decision making is reported, it is difficult to see how the current system could be improved in this respect. Even where doubt is expressed as to how a decision is reached, all information available for the decision making is published, allowing any stakeholder to draw their own conclusions, and there is frequent feedback from NGOs, scientists and other stakeholders.

For example, in 2006/07 Libya and Turkey objected to the recommendation for a rebuilding plan for Mediterranean bluefin tuna, on basis that quota allocation was unfair. They proposed their catch limits unilaterally on the basis of historical catch from a particular year. Even in this case a credible explanation is provided, albeit the dispute remains unresolved. Other decisions, such as reducing bycatch, improving size composition or setting the overall catch and effort limits, can be clearly linked to the scientific reports. With detailed formal public reporting of decisions and all information on which those decisions are based, the ICCAT fisheries meet SG100.

Indian Ocean Tuna Commission

Recommendations from research, monitoring, evaluation and performance review are published formally. Likewise, reports of the plenary sessions of meetings are published formally and are publicly available. This formal reporting represents best practice. While some groups may believe that how all information is used in the decision making is reported, it is difficult to see how the current system could be improved in this respect. Even where doubt is expressed as to how a decision is reached, all information available for the decision making is published, allowing any

stakeholder to draw their own conclusions, and there is frequent feedback from NGOs, scientists and other stakeholders.

With detailed formal public reporting of decisions and all information on which those decisions are based, the IOTC fisheries meet SG100.

Western and Central Pacific Fishery Commission

Recommendations from research, monitoring, evaluation and performance review are published formally. Likewise, reports of the plenary sessions of meetings are published formally and are publicly available. This reporting represents good practice. While some groups may believe that how all information is used in the decision making is not reported, it is difficult to see how the current system could be improved in this respect. Even where doubt is expressed as to how a decision is reached, all information available for the decision making is published, allowing any stakeholder to draw their own conclusions, and there is frequent feedback from NGOs, scientists and other stakeholders.

However, while reports are available, it is not clear that they represent all information that is used. There is no formal, detailed explanation linking the information provided to the decision that results. The decisions are presented in the resolutions as results, with minimal justification. In an international context, it is very difficult to give full explanations for all decisions, since this might undermine co-operation.

With detailed formal public reporting of decisions and information on which those decisions are based, the WCPFC fisheries do meet SG80. However, this falls short of a formal justification that can be clearly linked to all information available, so SG100 is not met.

Inter-American Tropical Tuna Commission

Recommendations from research, monitoring, evaluation and performance review are published formally. Likewise, reports of the plenary sessions of meetings are published formally and are publicly available. This reporting represents good practice. While some groups may believe that how all information is used in the decision making is not reported, it is difficult to see how the current system could be improved in this respect. Even where doubt is expressed as to how a decision is reached, all information available for the decision making is published, allowing any stakeholder to draw their own conclusions, and there is frequent feedback from NGOs, scientists and other stakeholders.

However, while reports are available, it is not clear that they represent all information that is used. There is no formal, detailed explanation linking the information provided to the decision that results. The decisions are presented in the resolutions as results, with minimal justification.

With detailed formal public reporting of decisions and information on which those decisions are based, the IATTC fisheries meet SG80. However, this falls short of a formal justification that can be clearly linked to all information available, so SG100 is not met.

3.2.2.e Approach to disputes		
60 Guidepost	80 Guidepost	100 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.

International Commission for the Conservation of Atlantic Tunas

ICCAT (the Commission) is not subject to any court challenges as of 2014. It does not indicate any disrespect or defiance of the law through repeated violations. There is no evidence that other entities flout the law, with the notable exception of particular fishing companies and fishing vessels, which are listed on the IUU fishing list. Therefore, excluding these, ICCAT and CPCs meet the SG60.

Given that there are no current outstanding judicial disputes and that so far CPCs have avoided resorting to using international law to settle disputes, the management system meets SG80 and SG100. By resolving disputes through ICCAT meetings (being members of ICCAT and agreeing to abide by ICCAT provisions), the CPCs have pro-actively avoided legal disputes.

However, specific fisheries undergoing certification will operate under national management systems, which would have to be considered in certifying that fishery. In most cases, it is likely a suitable legal system will exist to deal with significant disputes between stakeholders, but this should be verified.

Indian Ocean Tuna Commission

There are no current outstanding judicial disputes and that so far CPCs have avoided resorting to using international law to settle disputes. However, since the process is relatively new the management system has not demonstrated it will act proactively. This meets SG80, but not SG100.

Western and Central Pacific Fishery Commission

WCPFC (the Commission) is not subject to any court challenges as of 2014. It does not indicate any disrespect or defiance of the law through repeated violations. There is no evidence that other entities flout the law, with the notable exception of particular fishing companies and fishing vessels, which are listed on the IUU fishing list. Therefore, excluding these, WCPFC and its members meet the SG60.

Given that there are no current outstanding judicial disputes and there are no outstanding international disputes, the management system meets SG80. By resolving disputes through WCPFC

meetings (being members of WCPFC and agreeing to abide by WCPFC provisions), the members have avoided legal disputes. However, issues facing WCPFC which could lead to challenges are just now coming to the forefront. Thus, there is no evidence yet of proactive actions.

Specific fisheries undergoing certification will operate under national management systems, which would have to be considered in certifying that fishery. In most cases, it is likely a suitable legal system will exist to deal with significant disputes between stakeholders, but this should be verified.

Inter-American Tropical Tuna Commission

IATTC (the Commission) is not subject to any court challenges as of 2011. It does not indicate any disrespect or defiance of the law through repeated violations. There is no evidence that other entities flout the law, with the notable exception of particular fishing companies and fishing vessels, which are listed on the IUU fishing list. Therefore, excluding these, IATTC and its Parties meet the SG60.

Given that there are no current outstanding judicial disputes and that so far CPCs have avoided resorting to using international law to settle disputes, the management system meets SG80 and SG100. By resolving disputes through IATTC meetings (being members of IATTC and agreeing to abide by IATTC provisions), the Parties have pro-actively avoided legal disputes.

However, specific fisheries undergoing certification will operate under national management systems, which would have to be considered in certifying that fishery. In most cases, it is likely a suitable legal system will exist to deal with significant disputes between stakeholders, but this should be verified.

Scoring for 3.2.2

International Commission for the Conservation of Atlantic Tunas: All SG60 and SG80 are met, and 2 out of 3 SG100 are met. 95

Indian Ocean Tuna Commission: All SG60 and SG80 are met, and 1 out of 3 SG100 are met. 85

Western and Central Pacific Fishery Commission: All SG60 and SG80, but no SG100, are met. 80

Inter-American Tropical Tuna Commission: All SG60 and SG80 are met, and 1 out of 3 SG100 are met. 85

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3.2.3 Compliance and enforcement: Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.

3.2.3.a MCS implementation		
60 Guidepost	80 Guidepost	100 Guidepost
Monitoring, control and surveillance **mechanisms** exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance **system** has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A **comprehensive** monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.

International Commission for the Conservation of Atlantic Tunas

ICCAT's strategies to improve compliance with its requirements and procedures revolve around vessel registration, catch monitoring and diplomatic and other pressures applied to nation states. In addition, in certifying a particular fishery, the MSC assessment will need to consider the particular performance of the responsible nation state.

A number of positive developments have taken place since 2006: a legally binding instrument on Port State Measures to prevent, deter and eliminate illegal, unreported or unregulated (IUU) fishing ("Port State Measures Agreement"); the work of FAO to develop a global record of fishing vessels and to develop criteria to assess the performance of flag States; the second meeting of the five RFMOs dealing with highly migratory fish stocks in San Sebastian, Spain, and the follow-up work already under way.

Most of the RFMOs managing tuna and tuna-like species use their vessel registers to establish 'positive lists'. ICCAT was the first RFMO to adopt such a measure, by establishing a record of large-scale fishing vessels authorized to operate within its area of competence. This record is based on information submitted by parties and cooperating non-parties. Importantly, vessels not entered into the record are deemed to be unauthorized to fish for, retain on board, transship or land tuna and tuna-like species. Parties to ICCAT are required to take a number of measures, among them prohibiting the transshipment and landing of tuna and tuna-like species by large-scale fishing vessels that are not entered into its record.

The main weakness of these lists is that they do not indicate whether a vessel is active in any particular ocean. Satellite based vessel monitoring systems are being introduced for vessels over 24 metres length. ICCAT adopted a recommendation requiring parties to implement VMS on vessels above 24 metres in length by no later than 1 July 2005 (later extended to 1 November 2005 and now implemented) and on vessels above 15 metres fishing for bluefin tuna from 1 January 2010.

In 2006 a combined list of all vessels included on the authorized lists of the five tuna RFMOs was established and published on the Internet (http://tuna-org.org/). It includes information from the authorized lists maintained by the CCSBT, IATTC, WCPFO, ICCAT and IOTC authorized list. In addition, the website contains links to the IUU vessel lists of each RFMO. This information sharing should improve enforcement.

ICCAT has established a port inspection scheme with minimum standards that guide inspectors as they monitor landings and transshipments, check compliance with ICCAT management measures, including quotas, and collect data and other information (ICCAT Recommendation 98-11 3).

A problem among many fisheries management systems, and tuna is no exception, is monitoring transshipment to prevent illegal catch entering the legal market. In 2005, ICCAT established a regional independent observer program for carrier vessels to monitor every transshipment operation involving large-scale tuna longline fishing vessels, which includes a record of vessels authorized to receive transshipment in the ICCAT area. Carrier vessels not entered on the record are deemed to be unauthorized to receive tuna or tuna-like species in transshipment operations. The flag State of the donor vessel is obliged to validate the statistical documents for the transshipped fish.

There is a statistical documentation program (SDP) for bluefin, bigeye and swordfish which is linked to information from observers. Criticisms of this have mainly centred on bluefin tuna which may be captured and then “farmed”, delaying their entry to markets and providing opportunities for circumventing the scheme.

Further control is possible through third party states. Some States have taken action to make it a violation of their domestic laws for their nationals to engage in activities that conflict with the fisheries laws of other countries. Perhaps the most powerful example is the Lacey Act in the United States of America, which is directed at the illicit trade in illegally caught fish and wildlife. United States prosecutors have used the Lacey Act’s provisions to deal with importations of illegally caught fish. In Guam and American Samoa, important ports for offloading tuna, the Lacey Act has been used to deal with violations of the laws of a number of Pacific island states.

Below the international level under direct ICCAT control, the fishery being certified will depend upon the performance of the flag state and vessels within the unit of certification. Many of the conservation and enforcement measures established by RFMOs put clear obligations on parties as the flag States. But there are also some measures directed at masters of fishing vessels, or even the fishing vessel itself. Typical examples are regulations for bycatch, minimum fish sizes and time and area restrictions.

Ultimately, it is the flag State that is responsible to the relevant RFMO for any failure to ensure that its measures are implemented and for the resulting violations of those measures by that State’s vessels. Problems persist over the general failure of certain flag States to exercise effective jurisdiction and control over their vessels. These States include both members and non-members of RFMOs. While there have been recommendations to monitor flag state performance in this regard, this has not yet been done.

Consolidated landings and other data should be submitted annually to ICCAT as required. The accuracy and timeliness of these submissions will need to be checked for each fishery in the unit of certification. Information on compliance is published as part of the Commission meeting report as Compliance Tables. If a flag state does not enforce the ICCAT’s recommendations and requirements such that MCS is compromised, those vessels will not meet SG60 and will not be eligible for certification.

At the international level, monitoring control and surveillance mechanisms exist, and have been implemented in these fisheries. In all cases considered here, they have been demonstrated to be effective where they are applied, meeting SG60 and SG80. Whether they are effective in a particular unit of certification will need to be determined.

At the international level, the system is not comprehensive and cannot be demonstrated to have the ability to consistently enforce relevant management measures. There are constant references to problems with enforcement in particular fisheries and by some flag states, which should prevent any fishery meeting SG100.

Indian Ocean Tuna Commission

IOTC's strategy to improve compliance started with the formation of a Compliance Committee which monitors the actions of the CPCs and has made resolutions for technical improvements. However, as noted by the PRP compliance in the form of catch reporting continues to be a problem. Indeed the creation of the current function of the Compliance Committee coincided with the PRPs recommendations.

However, this cannot be termed a compliance "system" as of yet. Such a system would demonstrate an ability to enforce relevant management measures. This will be especially important once allocations are made in that compliance monitoring is closely linked to perceived fairness. A number of recommendations from the 2009 performance review relevant to compliance are being acted upon. This includes recommendation 51 "IOTC should develop a comprehensive monitoring, control and surveillance (MCS) system through the implementation of the measures already in force, and through the adoption of new measures and tools such a possible on–board regional observers' scheme, a possible catch documentation scheme as well as a possible system on boarding and inspection.". This is reported as "on-going", with some actions such as the regional observer programme having been implemented and others, such as the regional high-seas boarding, under development.

At the international level, monitoring control and surveillance mechanisms do not yet fully exist, and have yet to be implemented. This meets SG60 but not SG80.

Western and Central Pacific Fishery Commission

WCPFC's strategies to improve compliance with its requirements and procedures revolve mainly around vessel registration, but include catch and effort monitoring and diplomatic and other pressures applied to nation states. In addition, in certifying a particular fishery, the MSC assessment will need to consider the particular performance of the responsible nation state.

There have been a number of positive developments since 2006 which apply to all RFMOs: a legally binding instrument on Port State Measures to prevent, deter and eliminate illegal, unreported or unregulated (IUU) fishing ("Port State Measures Agreement"); the work of FAO to develop a global record of fishing vessels and to develop criteria to assess the performance of flag States; the second meeting of the five RFMOs dealing with highly migratory fish stocks in San Sebastian, Spain, and the follow-up work already under way.

Management controls are implemented using Conservation and Management Measures and Resolutions. "Resolutions" are non-binding statements and recommendations addressed to members of the Commission and Cooperating non-members, whereas Conservation and Management Measures (CMM) describe binding decisions.

Most information on compliance comes from port monitoring, observer programs and the vessel monitoring systems. The WCPFC has established a regional scientific and enforcement program with a regional observer program coordinated by the Commission (CMM 2007-01), but also with the participation of sub-regional and national programs (similar to CCAMLR). The Commission's regional observer program objective is to achieve 5% coverage of the effort in each fishery by 30 June 2012 for vessels operating in high seas areas. The Technical and Compliance Committee reported in 2010 that longline vessel coverage varies widely in 2009, whereas purse-seine coverage for multilateral programs for 2009 was approximately 20%, with 100% observer coverage for purse-seine vessels commencing in January 2010. Since 2010, observer coverage for purse seiners has been 100%. In the

same way as for most tuna RFMOs, observers are required to monitor the transshipments at sea (CMM 2006-06). There are also at-sea inspections carried out which are reported to WCPFC, but these relatively rare.

All vessels over 24m length catching tuna within the region must have VMS (CMM 2007-02). Other requirements include measures to reduce bycatch mortality of seabirds (CMM 2007-04), sea turtles (CMM 2008-03) and sharks (CMM 2010-07). Bycatch of seabirds and sea turtles are not thought significant in the tropical fisheries, and therefore are of lower priority (depending on the fishery being certified). Bycatch of shark species is significant depending on the gear used, and WCPFC intends to implement the FAO International Plan of Action for the Conservation and Management of Sharks (IPOA Sharks) through CMM 2010-07.

WCPFC, like most of the RFMOs managing tuna and tuna-like species, uses its vessel registers to establish a 'positive lists' and identify IUU vessels, information which is shared with other RFMOs (CMM 2010-06). This record is based on information submitted by parties and cooperating non-parties. Importantly, vessels not entered into the record are deemed to be unauthorized to fish for, retain on board, transship or land tuna and tuna-like species. Similarly, there is a shared IUU vessel list. The main weakness of these lists is that they do not indicate whether a vessel is active in any particular ocean.

In 2006 a combined list of all vessels included on the authorized lists of the five tuna RFMOs was established and published on the Internet (http://tuna-org.org/). It includes information from the authorized lists maintained by the CCSBT, IATTC, WCPFO, ICCAT and IOTC authorized list. In addition, the website contains links to the IUU vessel lists of each RFMO. This information sharing should improve enforcement.

A problem among many fisheries management systems, and tuna is no exception, is monitoring transshipment to prevent illegal catch entering the legal market. As well as the observer program for transshipments, which is being implemented, WCPFC is also developing a Catch Documentation Scheme which should reduce the opportunities for IUU fishing and complement the vessel register. Port State Measures have been implemented to an extent, but significant gaps remain. However, these initiatives are in the process of being fully implemented.

Further control is possible through third party states. Some States have taken action to make it a violation of their domestic laws for their nationals to engage in activities that conflict with the fisheries laws of other countries. Perhaps the most powerful example is the Lacey Act in the United States of America, which is directed at the illicit trade in illegally caught fish and wildlife. United States prosecutors have used the Lacey Act's provisions to deal with importations of illegally caught fish. In Guam and American Samoa, important ports for offloading tuna, the Lacey Act has been used to deal with violations of the laws of a number of Pacific island states.

Below the international level, the fishery being certified will depend upon the performance of the flag state and vessels within the unit of certification. Many of the conservation and enforcement measures established by RFMOs put clear obligations on parties as the flag states. But there are also some measures directed at masters of fishing vessels, or even the fishing vessel itself. Typical examples are regulations for bycatch, minimum fish sizes and time and area restrictions. These latter can be enforced more easily for larger vessels using VMS.

Ultimately, it is the flag State that is responsible to the relevant RFMO for any failure to ensure that its measures are implemented and for the resulting violations of those measures by that State's vessels. Problems persist over the general failure of certain flag States to exercise effective jurisdiction and control over their vessels. These States include both members and non-members of RFMOs. While there have been recommendations to monitor flag state performance in this regard, this has not yet been done.

Consolidated landings and other data should be submitted annually to WCPFC as required. The accuracy and timeliness of these submissions will need to be checked for each fishery in the unit of

certification. If a flag state does not enforce the WCPFC's recommendations and requirements such that MCS is compromised, those vessels will not meet SG60 and will not be eligible for certification.

Therefore, at the international level, monitoring control and surveillance mechanisms exist, and have been implemented in these fisheries. In all cases considered here, they have been demonstrated to be effective where they are applied, meeting SG60 and SG80. Given that a number of initiatives are still in the process of being implemented, there is an argument that SG80 is not yet met until they are shown to be effective. However, the main enforcement system is already operational, and these developments should be continuous in fisheries monitoring, control and surveillance systems. Whether they are effective in a particular unit of certification will need to be determined.

At the international level, the system is not comprehensive and cannot be demonstrated to have the ability to consistently enforce relevant management measures. Evidence exists of gaps in port state control, compliance in all resolutions and so on, which should prevent most fisheries meeting SG100.

Inter-American Tropical Tuna Commission

IATTC's strategies to improve compliance with its requirements and procedures revolve mainly around vessel registration, but include catch and effort monitoring and diplomatic and other pressures applied to nation states. In addition, in certifying a particular fishery, the MSC assessment will need to consider the particular performance of the responsible nation state.

There have been a number of positive developments since 2006 which apply to all RFMOs: a legally binding instrument on Port State Measures to prevent, deter and eliminate illegal, unreported or unregulated (IUU) fishing ("Port State Measures Agreement"); the work of FAO to develop a global record of fishing vessels and to develop criteria to assess the performance of flag States; the second meeting of the five RFMOs dealing with highly migratory fish stocks in San Sebastian, Spain, and the follow-up work already under way.

Most information on compliance comes from port monitoring and observer programs. The IATTC has the longest-established regional scientific and enforcement program and is unusual in that it has a regional observer program fully coordinated by the Secretariat, with its own observers, but also with the participation of national programs (similar to CCAMLR). There is 100% coverage for purse seiners above 363 t capacity, but IATTC has not established a regional longline observer program. However, some of its members do have national programs for longliners. In 2011, IATTC required that each member and cooperating non-Member (CPCs) ensure that, from 1 January 2013, at least 5% of the fishing effort made by its longline fishing vessels greater than 20 metres length overall carry a scientific observer (C-11-08). In the same way as for ICCAT and IOTC, observers monitor the transshipments at sea by large-scale tuna longline vessels (Resolution C-12-07) and checks that transshipped tuna quantities are consistent with the catch reported in the IATTC transshipment declaration. All carrier vessels receiving such transshipments at sea of tuna-like species from LSTLVs in the IATTC Area must have an IATTC observer on board.

Administered by the IATTC for the AIDCP, purse-seine vessels greater than 363 metric tons carrying capacity must carry an observer and has been mandatory since 2000. The main purpose of this observer program is to monitor the incidental catch of dolphins in the purse-seine fishery. The data collected form the basis for determining whether a Dolphin Mortality Limit (DML) has been exceeded, and is also used for scientific and research purposes, as well as for monitoring compliance with IATTC management and conservation measures. At least 50% of the observers on each Party's vessels must be IATTC observers; the remainder may be from the Party's national observer program. Not all vessels are monitored, smaller vessels being exempt from the observer program.

All member vessels over 24m length catching tuna within the region must, by 2016, have VMS (Resolution C-14-02). This is particularly important for time-area closure for bigeye. Other resolutions include measures to reduce bycatch mortality of dolphins, seabirds, sea turtles and sharks. These resolutions on bycatch of sharks and turtles have been effective, but there is some evidence that not all vessels comply with requirements.

IATTC, like most of the RFMOs managing tuna and tuna-like species, uses its vessel registers to establish a 'positive lists' and identify IUU vessels, information which is shared with other RFMOs (Resolutions C-11-05, C-14-01). This record is based on information submitted by parties and cooperating non-parties. Importantly, vessels not entered into the record are deemed to be unauthorized to fish for, retain on board, transship or land tuna and tuna-like species. Similarly, there is a shared IUU vessel list. The main weakness of these lists is that they do not indicate whether a vessel is active in any particular ocean.

In 2006 a combined list of all vessels included on the authorized lists of the five tuna RFMOs was established and published on the Internet (http://tuna-org.org/). It includes information from the authorized lists maintained by the CCSBT, IATTC, WCPFO, ICCAT and IOTC authorized list. In addition, the website contains links to the IUU vessel lists of each RFMO. This information sharing should improve enforcement.

IATTC has implemented some Port State Measures and since 2003 a Catch Documentation Scheme for bigeye tuna. Landings and transshipments are monitored and there are systems to check compliance with management measures, and collect data and other information. There are gaps, however, in implementing procedures across the region which include limited sharing of information on IUU fishing activities and a lack of regional measures against IUU vessels using ports and port facilities in the region.

Further control is possible through third party states. Some States have taken action to make it a violation of their domestic laws for their nationals to engage in activities that conflict with the fisheries laws of other countries. Perhaps the most powerful example is the Lacey Act in the United States of America, which is directed at the illicit trade in illegally caught fish and wildlife. United States prosecutors have used the Lacey Act's provisions to deal with importations of illegally caught fish. In Guam and American Samoa, important ports for offloading tuna, the Lacey Act has been used to deal with violations of the laws of a number of Pacific island states.

Below the international level, the fishery being certified will depend upon the performance of the flag state and vessels within the unit of assessment. Many of the conservation and enforcement measures established by RFMOs put clear obligations on parties as the flag States. But there are also some measures directed at masters of fishing vessels, or even the fishing vessel itself. Typical examples are regulations for bycatch, minimum fish sizes and time and area restrictions. These latter can be enforced more easily for larger vessels using VMS.

Ultimately, it is the flag State that is responsible to the relevant RFMO for any failure to ensure that its measures are implemented and for the resulting violations of those measures by that State's vessels. Problems persist over the general failure of certain flag States to exercise effective jurisdiction and control over their vessels. These States include both members and non-members of RFMOs. While there have been recommendations to monitor flag state performance in this regard (e.g. UN, 2006, Annex, para. 61), this has not yet been done.

Consolidated landings and other data should be submitted annually to IATTC as required. The accuracy and timeliness of these submissions will need to be checked for each fishery in the unit of certification. If a flag state does not enforce the IATTC's recommendations and requirements such that MCS is compromised, those vessels will not meet SG60 and will not be eligible for certification.

Therefore, at the international level, monitoring control and surveillance mechanisms exist, and have been implemented in these fisheries. In all cases considered here, they have been demonstrated to be effective where they are applied, meeting SG60 and SG80. Whether they are effective in a particular unit of certification will need to be determined.

At the international level, the system is not comprehensive and cannot be demonstrated to have the ability consistently to enforce relevant management measures. Evidence exists of gaps in port state control, compliance in all resolutions and so on, which should prevent most fisheries meeting SG100.

3.2.3.b Sanctions		
60 Guidepost	80 Guidepost	100 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.

International Commission for the Conservation of Atlantic Tunas

Conservation measures, including annual landings quotas are set by ICCAT, but enforcement is carried out by the national authorities. Although flag states are supposed to control the activities of their vessels, it is recognized that there a weakness and CPCs are given authority to check and apply controls to such vessels. A register of vessels that flout ICCAT conservation measures is maintained and shared with other RFMOs. These vessels should be restricted in their fishing opportunities once they are recognized in this way.

The most serious sanctions that can be applied collectively by the members of an RFMO are blacklisting of member vessels and quota reductions. These have been applied to a limited extent in ICCAT.

The blacklisting of non-member vessels (IUU lists) has become a widespread practice among all RFMOs including ICCAT. ICCAT has also introduced a system for blacklisting vessels flying the flags of members that have been engaged in IUU fishing, although this has not been effective. Only CCAMLR has used this system to any extent and therefore represents best practice in this regard.

An example of a sanction on a non-Contracting Party is the quota limit applied to Chinese Taipei for activities in the bigeye tuna fishery. The sanction consisted in cutting the 2006 quota of bigeye tuna from what could have been 16 500t to 4 600t. In addition, ICCAT stipulated Chinese Taipei vessels must have a maximum of 15 vessels targeting bigeye reduced from approximately 100 vessels in 2005.

Punitive measures are also applied to discourage flouting agreements. If an ICCAT member nation exceeds its catch limit for two consecutive management periods, ICCAT will recommend appropriate measures including, but not limited to, reduction in the catch limit equal to 125% of the overage, and if necessary, trade measures. Such measures have been applied to the EU for example.

Also, ICCAT has adopted framework provisions enabling trade restrictive measures to be taken against individual States if necessary, but only when other actions either have proved to be unsuccessful or would not be effective, and after due process. Although also available to other RFMOs, ICCAT is the only RFMO to have used trade-restrictive measures against an individual State. It currently has import bans in place against Bolivia and Georgia, neither of which is a member of ICCAT.

On the whole, sanctions appear to be applied among countries consistent with their involvement in ICCAT. The most serious sanctions have been applied to countries and fishing entities which are not members of ICCAT. Sanctions applied to CPCs have generally been weak.

Sanctions are not fully effective as a deterrent. At the extreme end, Mediterranean bluefin tuna conservation agreements appear constantly to be in difficulty, and, although bluefin is outside the scope of this report, vessels appear to believe that they can flout the same basic management system which is applied to all fisheries. There are constant problems with other fisheries (see ICCAT Compliance Tables), presumably because the perpetrators feel they have a reasonable chance of not suffering sanctions or that sanctions are too weak. However, many issues of non-compliance in relation to providing data and information may also be due to limits on technical capacity in the responsible management authorities, particularly developing countries. It is noticeable that in responding to each State's compliance issues, the Compliance Committee intends to write to each State requesting improvements in data provided.

Sanctions to deal with non-compliance certainly exist and there is evidence that they are applied, meeting SG60. However, evidence suggests that they are not an effective deterrent, which does not meet SG80.

Indian Ocean Tuna Commission

Sanctions to deal with non-compliance exist and there is some evidence that they are applied. This is a function of the Compliance Committee. But as discussed by the PRP the actions have been limited. This is seen as primarily the duty of Contacting and Non-Contracting Parties (CPCs), among which sanctions are not necessarily consistently applied. There is no scheme of penalties and incentives for CPCs. This meets SG60 but not SG80.

Western and Central Pacific Fishery Commission

Conservation measures are set by WCPFC, but enforcement is carried out by the national authorities. The blacklisting of non-member vessels (IUU lists) has become a widespread practice among all RFMOs including WCPFC.

There no trade sanctions against nation states, although theoretically these may be possible. Sanctions are only applied to fishing entities, such IUU vessels and vessels that are detected as being non-compliant with resolutions. WCPFC notifies Flag States of non-compliant vessels, which the Flag States should order to withdraw from Commission Area. These sanctions appear to be applied consistently.

On the whole, sanctions appear to be applied among countries consistent with their involvement in WCPFC. IUU fishing continues to be a problem, although tightening of Port State Controls and implementing a Catch Documentation Scheme should further reduce this problem. Given the very large potential fishing area, eliminating all IUU fishing will be difficult. However, access to the very large area has been very effectively controlled through co-operation among coastal states and a very effective vessel register. This prevents significant IUU fishing occurring across much of the Pacific, although IUU does occur. A formal compliance monitoring system is being developed, while the Technical and Compliance Committee discusses compliance issues based on available information of infringements from observers and other sources. Sanctions are then agreed, such as exclusion of vessels and so on, and reported in the same way.

Sanctions to deal with non-compliance certainly exist and there is evidence that they are applied, meeting SG60. Further evidence of sanctions will be needed in particular cases, as sanctions are enforced by the flag state. Limited evidence suggests that sanctions are probably an effective deterrent, which meets the SG80, but does not meet SG100.

Inter-American Tropical Tuna Commission

Conservation measures are set by IATTC, but enforcement is carried out by the national authorities. The blacklisting of non-member vessels (IUU lists) has become a widespread practice among all RFMOs including IATTC.

There no trade sanctions against nation states, although theoretically these may be possible. Sanctions are only applied to fishing entities, such IUU vessels and vessels that are detected as being non-compliant with resolutions. The Director of IATTC notifies Flag States of non-compliant vessels, which the Flag States then order to withdraw from Commission Area. There is an indirect trade sanction through removal of the “dolphin safe” certification. These sanctions appear to be applied consistently.

On the whole, sanctions appear to be applied among countries consistent with their involvement in IATTC. IUU fishing continues to be a problem, although tightening the Port State Controls should reduce this problem. Bigeye is most affected, and has shown signs of recovery suggesting that controls, including those discouraging IUU fishing, are effective.

Some non-compliance has been detected by the observer programmes, which is used as the basis for routinely reviewing compliance. Some non-compliance appears persistent; having been initially reduced, it has not been eliminated and continues with no recent evidence of further decline. The reason for this non-compliance is unclear. However, seeing that this non-compliance is reported by observers on board, and there is little effort to hide these activities, the fishers in these cases are most likely unaware of their responsibilities. Overall, non-compliance is measured, it does not appear substantial and efforts are being undertaken to reduce it.

Sanctions to deal with non-compliance certainly exist and there is evidence that they are applied, meeting SG60. Limited evidence suggests that they are probably an effective deterrent, which meets the SG80, but does not meet SG100.

3.2.3.c Compliance		
60 Guidepost	80 Guidepost	100 Guidepost
Fishers are **generally thought** to comply with the management system 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.

International Commission for the Conservation of Atlantic Tunas

This performance indicator applies to fishers and therefore needs to consider the requirements of ICCAT when considering compliance. This would need to be addressed for each specific unit of certification.

There are numerous issues with non-compliance, although it is not always clear where or why they occur or who is responsible. The Performance Review indicated that there are so many rules and

requirements, with many being difficult to understand, that some if not all CPCs struggled to comply with all requirements. The Performance Review found that CPCs have consistently failed to provide timely and accurate data and failed to implement monitoring, control and surveillance (MCS) arrangements on nationals and national companies. However, it also stated that "Most of the problems and challenges ICCAT faces would be simple to fix if CPCs developed the political will to fully implement and adhere to the letter and spirit of the rules and recommendations of ICCAT." This seems to place the blame on the national institutions rather than fishers. Nevertheless, the ultimate test is whether the fishers themselves comply with ICCAT provisions.

ICCAT has a Compliance Committee that monitors compliance with ICCAT recommendations. This Committee has the potential to address problems over implementation of ICCAT recommendations. The performance review found that the ICCAT standing committee and panel structure was sound and the committees provide timely advice, but had strong reservations on the performance of the Compliance Committee (CC).

ICCAT prepares and distribute an annual "Compliance Annex" that includes: 1) all catch limits and minimum sizes/tolerances; 2) each party's catch statistics submitted to SCRS for the current reporting year, and any revisions to previous years' data; 3) any overages and underages; 4) all catch limit reductions that the party must take; and 5) the dates by when such reductions shall be taken. ICCAT also provides a compliance table which records a summary of issues, CPC responses and actions taken by the Committee. However, without an observer programme, assessing compliance of fishers with various Recommendations may be difficult.

With the exception of those cases where specific non-compliance has been identified (e.g. IUU fishing), compliance of fishers typically appears adequate in the fisheries considered here, which meets SG80. However, there are sufficient gaps in information to prevent there being high degree of confidence that fishers in most fisheries comply, making it difficult to meet SG100. In addition, any fishery would not meet SG60 if they were not providing catch data (ICCAT requires such data even if the flag state does not).

Indian Ocean Tuna Commission

This performance indicator applies to fishers and therefore needs to consider the requirements of IOTC when considering compliance. This would need to be addressed for each specific unit of certification.

There are numerous issues with non-compliance, although it is not always clear where or why they occur or who is responsible. The 2009 Performance Review indicated that there are so many rules and requirements, with many being difficult to understand, that some if not all CPCs struggled to comply with all requirements. The Performance Review found that some countries have consistently failed to provide timely and accurate data. Issues have been raised by CPCs in response to the Compliance Committee.

IOTC has a Compliance Committee that monitors compliance with recommendations. This Committee has the potential to address problems over implementation of IOTC recommendations. The 2009 performance review found that the committee structure was sound. The Committee publishes compliance reports for each CPC based on information received. Together, some information is provided that the fisheries comply with the majority of IOTC management measures.

Compliance of fishers typically appears adequate in the fisheries considered here, which meets SG80. However, there are sufficient gaps in information to prevent there being high degree of confidence that fishers in most fisheries comply, making it difficult to meet SG100. In addition, any fishery would not meet SG80 if they were not meeting basic IOTC reporting obligations.

Western and Central Pacific Fishery Commission

The WCPFC has a permanent working group on compliance that reviews and monitors compliance with WCPFC management measures. The working group also recommends measures to promote compatibility among the national fisheries management measures, addressing matters related to compliance with fisheries management measures, analyse information on compliance and report the findings to the WCPFC, which will in turn inform the members and non-members. An annual report is produced as part of the compliance review, which reports observed infringements.

Not all fisheries comply and clearly there is some non-compliance by some vessels as reported by the Technical and Compliance Committee. However, reporting on compliance is not as complete, at least in the public, as other RFMOs. This may be because WCPFC only came into existence in 2004, so these procedures are still in development.

Compliance of fishers appears adequate in the fisheries considered here, which meets SG80. While issues have been identified, they do not appear very widespread or systematic. However, there are sufficient gaps in information to prevent there being high degree of confidence that fishers in most fisheries comply, making it difficult to meet SG100. In addition, any fishery would not meet SG60 if they were not providing catch data (WCPFC requires such data even if the flag state does not) or contravening other resolutions.

Inter-American Tropical Tuna Commission

The IATTC has a permanent working group on compliance that reviews and monitors compliance with IATTC management measures. The working group also recommends measures to promote compatibility among the national fisheries management measures, addressing matters related to compliance with fisheries management measures, analyse information on compliance and report the findings to the IATTC, which will in turn inform the members and non-members. An annual report is produced as part of the compliance review, which reports observed infringements.

Not all fisheries comply and clearly there is some non-compliance by some vessels. Examples include non-compliance in treatment of ETP species bycatch and tuna discards. Because this performance indicator applies to fishers, it should be re-assessed for each specific unit of assessment.

Compliance of fishers appears adequate in the fisheries considered here, which meets SG80. While issues have been identified, they do not appear very widespread or systematic. However, there are sufficient gaps in information to prevent there being high degree of confidence that fishers in most fisheries comply, making it difficult to meet SG100. In addition, any fishery may not meet SG60 if they were not providing catch data (IATTC requires such data even if the flag state does not) or contravening other resolutions.

3.2.3.d Systematic non-compliance		
60 Guidepost	80 Guidepost	100 Guidepost
	There is no evidence of systematic non-compliance.	

International Commission for the Conservation of Atlantic Tunas

There is no evidence of systematic non-compliance. Non-compliance with conservation measures appears mostly opportunistic for the tuna species considered here. Non-compliance with ICCAT requirements appears most often related to genuine difficulties in obtaining the relevant information from fisheries in a timely manner. As information improves, it is possible more non-compliance will become apparent, but for stocks being considered here, such non-compliance is not systematic and does not threaten the sustainability of the fishery.

There has been systematic non-compliance for Mediterranean bluefin tuna, but this is outside the scope of this report. In this case, ICCAT's failure to meet its objectives is due in large part to the lack of compliance by many of its CPCs.

Indian Ocean Tuna Commission

There is no evidence of major systematic non-compliance. Compliance problems largely relate to catch reporting, especially by some non-Member States. It appears most often related to genuine difficulties in obtaining the relevant information from fisheries in a timely manner.

It should be noted, however, of the 2 purse seiners and 20 longliners inspected at sea in the UK Indian Ocean Territories, 19 longliners were in found to be in breach of one or more IOTC CMMs when boarded. As well as a few other problems, none had gear markings required under Resolution 13/02.

As information improves, it is possible more non-compliance will become apparent. For stocks being considered here, such non-compliance does not threaten the sustainability of the fisheries, although more precaution might be needed in the management system to allow for resulting potential increased levels of unreported and illegal fishing. However, for a UoA (e.g. longliners belonging to these groups) any evidence of such systematic breaches of measures should lead to the fishery not meeting SG80. For fisheries overall, the SG80 is met.

Western and Central Pacific Fishery Commission

There is no evidence of systematic non-compliance. Non-compliance with conservation measures appears mostly opportunistic or possibly down to ignorance of the resolutions and/or the lack of sanctions. Non-compliance is not systematic and does not threaten the sustainability of the fishery, there having been a significant reduction in non-compliance over the last decade.

Inter-American Tropical Tuna Commission

There is no evidence of systematic non-compliance. Non-compliance with conservation measures appears mostly opportunistic or possibly down to ignorance of the resolutions and/or the lack of sanctions. Non-compliance is not systematic and does not threaten the sustainability of the fishery, there having been a significant reduction in non-compliance over the last decade.

Scoring for 3.2.3

International Commission for the Conservation of Atlantic Tunas: All SG60 and 3 out of 4 SG80 are met. 75

Indian Ocean Tuna Commission: All SG60 and 2 out of 4 SG80 are met. 70

Western and Central Pacific Fishery Commission: All SG60 and SG80, but no SG100, are met. 80

Inter-American Tropical Tuna Commission: All SG60 and SG80, but no SG100, are met. 80

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3.2.4 Monitoring and management performance evaluation: There is a system for 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.

3.2.4.a Evaluation coverage		
60 Guidepost	80 Guidepost	100 Guidepost
There are mechanisms in place to evaluate **some** parts of the fishery-specific management system.	There are mechanisms om place to evaluate **key** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **all** parts of the fishery-specific management system.

International Commission for the Conservation of Atlantic Tunas

ICCAT has in place mechanisms to evaluate all parts of the management system and is subject to regular internal review. This is demonstrated by the various committees and working groups that meet regularly and report their findings to the Commission. An external performance review has been conducted and it has evaluated all parts of the management system. This meets the requirements for the SG100.

Indian Ocean Tuna Commission

IOTC has in place mechanisms to evaluate all parts of the management system. This is demonstrated by the various committees and working groups that meet regularly and report their findings to the Commission. As noted, the 2009 PRP has also evaluated all parts of the management system. These evaluations meet SG100.

Western and Central Pacific Fishery Commission

WCPFC has in place mechanisms to evaluate all parts of the management system as demonstrated by the various committees and working groups that meet regularly and report their findings to the Commission. This meets the requirements for SG100 are met.

Inter-American Tropical Tuna Commission

IATTC has in place mechanisms to evaluate all parts of the management system, meeting SG100. This is demonstrated by the various committees and working groups that meet regularly and report their findings to the Commission.

3.2.4.b Internal and/or external review		
60 Guidepost	80 Guidepost	100 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.

International Commission for the Conservation of Atlantic Tunas

ICCAT has in place mechanisms to evaluate all parts of the management system and is subject to regular internal review. This is demonstrated by the various committees and working groups that meet regularly and report their findings to the Commission. An external performance review has been conducted and it has evaluated all parts of the management system.

While the reviews do meet SG100 requirement that all parts of the management system are evaluated, there is no evidence that the external review will be regular. This is the first and only review of this kind that has been conducted. It is likely to be occasional as required by SG80, in response to calls for external reviews of all RFMOs.

Indian Ocean Tuna Commission

IOTC is subject to regular internal review. This is demonstrated by the various committees and working groups that meet regularly and report their findings to the Commission. As noted, the 2009 PRP was a formal external performance review that was conducted and it has evaluated all parts of the management system. There is a clear monitored response to the review, where progress against recommendations is being reported. In 2013 at its 17th Session, the Commission agreed to undertake a second formal Performance Review process and this is currently underway, but has not been completed as of 2014.

The reviews do meet SG100 requirement that all parts of the management system are evaluated. In addition, with the initiation of a new performance review within 5 years of the first review, current reviews appear to be undertaken regularly (although there is no requirement to do this). Based on the current level of external review, the IOTC meets SG100.

Western and Central Pacific Fishery Commission

WCPFC is subject to regular internal review as demonstrated by the various committees and working groups that meet regularly and report their findings to the Commission. This meets the requirements for SG100 for the “regular internal” review. In addition, the WCPFC has completed an external performance review in 2012, originally proposed in 2007. The RFMO meets SG80 with respect to “occasional external” review, but there is no evidence yet that this will be regular, so SG100 is not met.

Inter-American Tropical Tuna Commission

IATTC is subject to regular internal review. This is demonstrated by the various committees and working groups that meet regularly and report their findings to the Commission and which are published. This meets the requirements for SG100 for the "regular internal" review. However, The IATTC has as yet not carried out an external performance review despite a general agreement by all five RFMOs responsible for tunas and tuna-like species held at their first joint meeting in Kobe, Japan in January 2007. This failure implies that the RFMO does not meet SG80 with respect to "occasional external" review.

Scoring for 3.2.4

International Commission for the Conservation of Atlantic Tunas: All SG60 and SG80, but no SG100, are met. 80

Indian Ocean Tuna Commission: All SG60, SG80 and SG100 are met. 100

Western and Central Pacific Fishery Commission: All SG60 and SG80 are met, and 1 out of 2 SG100 are met. 90

Inter-American Tropical Tuna Commission: All SG60 and 1 out of 2 SG80 are met. 70

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Appendix 1. WWF review and authors' responses

NOTE: The WWF Smart Fishing Initiative (SFI) kindly provided an extensive review of an early draft of this document. The WWF comments and the responses from the authors are given below. In some cases, scores were revised. The final scores given by the authors are reflected in the sections above.

World Wide Fund for Nature (WWF) input into the ISSF document: An Evaluation of the Sustainability of Global Tuna Stocks Relative to Marine Stewardship Council Criteria by P Medley and J. Powers

Summary:

WWF raises a number of critical issues relating to *An Evaluation of the Sustainability of Global Tuna Stocks Relative to Marine Stewardship Council Criteria* (ISSF Evaluation). WWF's concerns are outlined below, focusing on the overall issues, with detailed examples given for some Indian Ocean stocks. Given more time and resources, WWF would be in a position to provide detailed comments on all 19 stocks, however at this time overarching concerns and the examples provided should be sufficient to justify a revision to the ISSF Evaluation. WWF notes that ISSF is satisfied "that the document has been taken into consideration in recent Full Assessments of tuna fisheries against the MSC standards". Therefore, to commission such evaluations carries with it the weight of responsibility. The responsibility is even greater for this iteration of the ISSF Evaluation, as Powers and Medley are the first people to assess Principles 1 and 3 against *MSC Fishery Standard Principles and Criteria for Sustainable Fishing, Version 2.0* in their entirety.

There is a lack of objective evidence provided by Powers and Medley team to provide a convincing case that the tuna stocks are managed sustainably, in conformance with the MSC requirements. The authors often use generic and ambiguous descriptions for the scoring justifications such as "clear evidence", and appear to presume these justifications to be "self-evident". In general the report does not conform with the MSC requirement 7.10.6.2 "The rationale shall make direct reference to every scoring issue and whether or not it is fully met." Explicitly, the MSC standards require that "each scoring issue shall be justified by supporting rationale" (7.10.2.3). For example, "In order to achieve a 100 score, all of the 60 issues, all of the 80 issues, and all of the 100 issues shall be met…" (7.10.2.3). Our comments do not point out each time that this nonconformity occurs. If the assumption is that this document can be used as a "reasonableness" test for assessors to point to in their own MSC assessments, scores will need to be revised and justifications made more descriptive and detailed.

An example of where there is consistently lack of objective evidence relates to Performance Indicators (PI) 1.2.1 and 1.2.2. Contrary to the text in this report, the evidence to date indicates that all of the stocks lack Harvest Strategies and any Harvest Control Rules as defined by the MSC, and, of greater concern, there is no evidence of a precautionary approach to management. This is 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 various relevant Regional Fisheries Management Organisation (RFMO) bodies. It is also not sufficient to base decisions on "implied" or "intended" measures, except where MSC guidance makes specific allowance for something to be implied (e.g. in PI 3.1.3). Measures must have been formally adopted by RFMOs to be well-defined and well-justified.

For example, the Indian Ocean Yellowfin tuna stock is believed to be currently in a 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 Indian Ocean Tuna Commission have taken positive steps in recent months, actively discussing and moving toward addressing some of the management shortfalls, until these are formally adopted through Indian Ocean Tuna Commission Resolution, this fishery cannot make claims of being sustainably managed.

While WWF accepts that the evaluation highlights areas where action is required to improve the management of the 19 tuna stocks through the RFMOs, the evaluation also places risk to the stock where scoring is not conservative. CABs for future client tuna fisheries in the MSC process will undoubtedly seek to save time and use the ISSF Evaluation, rather than conducting their own first-hand research, thereby drawing the same conclusions (where they see those conclusions benefit their client). The eventual certification of fisheries that do not meet the intent of the MSC program, undermines and weakens the integrity of the program, and more importantly result greater risks to the stocks and less fisheries improvement. Fisheries that delay entry to MSC full assessment may be provided support to improve those areas that do not meet the minimum standards, for example through a WWF Fisheries Improvement Project. These fisheries benefit from improving their sustainability while still being linked to WWF's market partners. The risk of flawed scoring and justification is not confined only to these tuna stocks. There is risk also to the people of the coastal states who depend on these stocks for their livelihoods, there is risk to the credibility of the MSC program itself and there is significant risk to all those whose commercial interests would be damaged by suspension of the certification should the relevant RFMO fail to respond appropriately to any decline in stock status (for example as is currently expected for Indian Ocean Yellowfin tuna within the next five years). WWF is particularly concerned with this evaluation as it is the first assessment of any tuna fishery against the new MSC standards (v2.0), for all of Principle 1 and Principle 3.
The authors may also wish to review the section headings as a number refer to incorrect sections.

Response (Paul Medley and Joe Powers)
Some text has been added to the introduction indicating the purpose and limitations of the report. We are not sure this addresses the concerns directly, but it should make it clearer how to interpret the findings.
Wherever possible, we have tried to clarify the report and meet the concerns raised by the WWF reviewers. Where we agree that there is insufficient evidence to support the score originally given, we have lowered the score.
However, the WWF reviewer's scoring procedure is fundamentally wrong. In particular, their alternative scoring builds dependencies between performance

indicators that are inconsistent with the scoring model (from the hierarchical simple additive weighting approach). This also fails to achieve the intention which is to test and monitor where tuna fisheries are in relation to some point set out as the MSC standard, and monitor improvements if any. Any scores below 60 are catastrophic for a fishery and there is no discrimination among any differences below SG60.
It is important to note that this report commissioned by ISSF was carried out independently by the authors, so it does not necessarily represent ISSF official view.
As this is a pre-assessment, the focus is more on identifying gaps rather than providing full justification for scores given. Otherwise maintaining this document will become too costly. The main focus should be to identify key interpretations and issues where fisheries are not likely to meet the standard. We have addressed issues which we think we missed. But in a full assessment, much more justification would need to be provided and issues addressed in much more depth in written form. This would include descriptions of the fishery, management system and so on.
The concern that CABs will use this document for full assessment is not well-founded. It may be used for pre-assessments and therefore it is most important for this purpose that key issues are identified rather than scores are 100% correct. It is likely that this report will discourage fisheries going for MSC certification as in the majority of cases they fail. The only possibility of passing are in those fisheries for stocks which are already certified, so there is already a precedence in these cases anyway. For full assessments, as the WWF reviewers point out, this report does not conform to requirements and the full process will have to be implemented in any case. This could include this review, making all the same points made by the WWF reviewers to convince the CAB assessors and other reviewers (including ASI), that they are correct.
More generally, and in our personal experience, the view that this approach will increase risks to fisheries is, at the very least, not universally true (the argument “The eventual certification of fisheries that do not meet the intent of the MSC program, undermines and weakens the integrity of the program, and more importantly result greater risks to the stocks and less fisheries improvement. …”). We emphasize this is our experience, but we can point to fisheries which fail to meet MSC and give up. For these fisheries, the MSC standard is irrelevant. Others have passed with conditions and continue to work very hard to improve and maintain their position. These fisheries have not met the standard yet, but represent what the MSC program is about. Some others are in FIPs, but the ones we know of believe they can be certified within a reasonable number of years, and are at risk of dropping out due to cost and ill-defined requirements. From what we know of tuna fisheries, while we agree the WWF reviewers set out a desirable goal, we just don’t think they will achieve that goal in our lifetime.

Comments on Principle 1:

PI 1.1.1 The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing

Overarching comments

Stock specific comments

Scoring Guidepost	Stock/s	Comment
1.1.1a SG100 There is a **high degree of certainty** that the stock is above the PRI.	Eastern Pacific Skipjack	Issue: The score assigned to PI 1.1.1.a is not sufficiently justified given uncertainties in key inputs to the stock assessment. Inter-American Tropical Tuna Commission (IATTC) scientists indicate that the Skipjack is a very difficult species to assess due to its highly variable productivity. It is hard to detect the effect of fishing on the population with regular stock assessment methods. This is the case of the Eastern Pacific Ocean stock, where there is lack of data on age composition and the few tagging data. Additionally, scientists affirm that age structured mortality is uncertain. In the Eastern Pacific Ocean, there are no reference points based on biomass or fishing mortality, or indicators with which to compare. One of the biggest problems is the uncertainty about whether the Catch Per Unit Effort (CPUE) of purse seine fisheries is an appropriate index of abundance for Skipjack, particularly if the fish are associated with Fish Aggregating Devices. The purse seine CPUE data are particularly problematic as it is difficult to identify the appropriate unit of effort. There is currently no reliable index of relative abundance for Skipjack in the Eastern Pacific Ocean, therefore alternative methods of assessment and management of the species that are robust to these uncertainties may need to be developed. In light of this background, it is important that more evidence about the condition of the stock is presented in order to have confidence in the rating assigned.
Response: Eastern Pacific Skipjack SI 1.1.1a score was reduced from SG100 to SG80 and SI 1.2.4b score was reduced from SG80 to SG60. There are significant uncertainties associated with this assessment, which were not captured in the scoring. The WWF reviewers point to the CPUE index. There is doubt that this index has a simple linear relationship with stock size, and this undermines any assessment, although this might be better to raise under 1.2.3. However, this is the best index they have, and this problem is true for all skipjack fisheries. These sorts of issues need to be handled in the stock assessment and, in any case, they still need to determine stock status in some way to meet the standard. Although the scoring here was correct, taking information at face value, it was inappropriate to say that the status is known with high certainty		

when the stock assessment is at fault, unless there was other evidence available. The score here has therefore been reduced to SG80. In retrospect, 1.2.4 was arguably not scored consistently since it refers to a previous assessment in 2004, but this was not used here to determine status. Under 1.2.4b, the score was reduced because there is no clear link between the reference points used and MSY. We think that this can probably be inferred, but with no recent stock assessment or explicit linkages provided in the evidence available, it seems difficult to support the SG80 score, which was therefore also reduced. Evidence on the condition of the stock is provided by the references. Repeating the detail of the original stock assessment is beyond the scope of this report.		
1.1.1.a SG80 It is **highly likely** that the stock is above the PRI.	Eastern Pacific Yellowfin	Issue: The score assigned to PI 1.1.1.a is not sufficiently justified given uncertainties in the stock assessment outputs. IATTC scientists affirm that there is uncertainty about recent and future recruitment and biomass levels. Scientists also say that there were two, and possibly three, different productivity regimes, and the levels of Maximum Sustainable Yield (MSY) and the biomass corresponding to MSY may be different between regimens. It is possible that the population has changed over the last ten years of a high regime to an intermediate productivity regime. The recent fishing mortality rates are below the MSY level, and it is estimated that recent levels of spawning biomass are at that level. These interpretations are uncertain and the results are more pessimistic if a stock-recruitment relationship is assumed. In light of this, more evidence about the real condition of the stock should be presented in order to have confidence in the rating assigned.
Response (Paul Medley and Joe Powers): No score change. MSY is defined based on environmental conditions (see MSC definition). The fact that there is uncertainty is part of stock assessment, and the points made here apply to all stock assessments, and is recognised in 1.2.4c. Available evidence is given in the reference. However, it should be noted that this is also a summary of the current scientific view of what is a complex and difficult assessment. We are unconvinced that copying an even briefer summary into this table will help elucidate this matter, and the best that can be done is to go back the original reports.		

1.1.1.a SG100 There is a **high degree of certainty** that the stock is above the PRI.	Western Pacific Yellowfin	Issue: The score assigned to PI 1.1.1.a is not sufficiently justified given uncertainties in key inputs to the stock assessment. The authors state: "The spawning stock estimate B_{2012}/B_0 = 0.38 compared to the newly adopted limit reference point of 20%B_0 (range 35-40% across all four alternative models). Because the stock is well above, and the estimated range excludes, the precautionary limit reference point, SG100 is met." This may be technically correct, prima facie, if you disregard the high level of uncertainty with respect to mortality. In a perfect world, the model would function on perfect information, in which case it would be reasonably to say there is a "high degree of certainty" that the stock is above the PRI. However, the Secretariat of the Pacific Community admits that there is a lot that is not understood about Pacific Yellowfin mortality, particularly due to the lack of operational data from the Distant Water Fishing Nations and substantial unreported catch from Indonesia and the Philippines. Thus, it would be more reasonable to, at best, score Western Pacific Yellowfin at the SG80 until such time as we have the complete information with which to make a "highly certain" assessment.
Response (Paul Medley and Joe Powers): No score change. This is correct scoring. For this PI, we score the scientific consensus view. The scientists report and are aware of these uncertainties and there is evidence from the report and advice that these uncertainties are not disregarded as suggested here. As there is an accepted stock assessment that attempts to account for uncertainty, we use those results for this score.		

Indian Ocean Tuna Commission

Scoring Guidepost	Stock/s	Comment
1.1.1.a SG100 There is **a high**	Indian Ocean Skipjack	Issue: the probabilities required to meet "a high degree of certainty" in PI 1.1.1.a SG80 appear not to be have been adhered to.

degree of certainty that the stock is above the PRI.		The authors consider that "there is a high degree of certainty that the stock is above the point where recruitment would be impaired". They also note confidence intervals of 80% for the biomass estimates, however the MSC requirements define a high degree of certainty for this PI as "greater than or equal to the 95th percentile". *Nonconformance with MSC requirements* SA2.2.1.3 High degree of certainty means greater than or equal to the 95th percentile.
Response (Paul Medley and Joe Powers): No score change. The 80% CI is reported because this is what is reported in the stock assessment. The 90%CI is not given. SA2.2.1.3 indicates the 95th percentile is provided as guidance to help define "high degree of certainty" quantitatively, it is not a requirement. The (approximate) 95% value is now added to the text, showing that for this assessment, the stock status is above any MSY point with a high degree of certainty.		
	Indian Ocean Yellowfin Tuna	Issue: the probabilities required to meet "a high degree of certainty" in PI 1.1.1.a SG80 appear not to be have been adhered to. Powers and Medley make their conclusions on the current state of the stock based on results of assessment conducted in 2012. 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. The Kobe plots 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 (IOTC–2013–SC16–R[E]) we have these notes: "Therefore 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, the author's rationale for their score is based the situation at 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. *Nonconformance with MSC requirements* SA2.2.1.3 High degree of certainty means greater than or equal to the 95th percentile.
Response (Paul Medley and Joe Powers): No change to the score. We take the point that there is considerable uncertainty and that the scientific advice is precautionary. However, the performance indicator scores the stock outcome, not the reasons for the outcome, which is covered under other PIs. The text has been improved. The score is allocated based on projection to 2013 (Kobe strategy matrix), which indicates the probability that the stock is below the MSY reference point for the highest catches considered is less than 1%, also noting that PRI < BMSY. Text has been added. We accept the point over the delay in the stock assessment and determination of stock status. However, if we don't score it on the basis of the 2013 estimate, it seems impossible to score it at all. No stock assessment was conducted in 2014, which suggests a disconnect between the scientific expectation (stock assessment every 4 years) and the actual assessment period. This seems to be a problem with the harvest strategy rather than the outcome PIs.		
1.1.1.b SG100 There is a **high degree of certainty** that the stock has been fluctuating around a level	Indian Ocean Yellowfin Tuna	Issue: in scoring PI 1.1.1.b, the authors have not taken into account the MSC requirement to "consider the biology of the species and the scale and intensity of both the UoA and management system and other relevant issues in determining relevant time periods over which to judge fluctuations". The WWF reviwers do not consider that a generally unidirectional decline in stock abundance

consistent with MSY or has been above this level over recent years.		over many years, with a possible dip below B_{targ} and a return above B_{targ}, attributed by the Indian Ocean Tuna Commission 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. 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: SA2.2.2 The team shall consider the biology of the species and the scale and intensity of both the UoA and management system and other relevant issues in determining relevant time periods over which to judge fluctuations.
Response (Paul Medley and Joe Powers): Indian Ocean Yellowfin 1.1.1b score reduced from SG100 to SG80. The evidence indicates that the stock is above the MSY reference point, not fluctuating around it. The comments mix evidence for the outcome and management PIs. We score status here, so why the status is good (piracy, luck etc.) is not addressed. This is the methodology, making it		

difficult to score it differently even if it appears “too high”.
The problem with “fluctuating around” occurs when the stock status falls below the MSY reference point. It is still possible at this stage to meet SG80 or SG100 if the stock shows no downward trend and remains around the target. It has never been possible to interpret this to everybody’s satisfaction. Fortunately the issue is not relevant in this case (scored against the “or has been above this level over recent years.” bit of the SG100). If the stock as at or below MSY and catches were greater than 300000t, the SG80 would not be met in our opinion until catches were reduced significantly. SA2.2.2 is fairly useless “guidance” and not really consistent with the rest of the methodology (i.e. scoring 1.1.2) and allows higher scores than might be merited (dependent on how precautionary the target RP is).
The implication that a stock “must be” at an MSY target which seems to have crept into MSC requirements is clearly incorrect. In general for status determinations, higher biomass levels are better.
However, there are two concerns raised above which suggest a lower score is appropriate. A new assessment probably should have been conducted in 2014 and as far as we are aware was not. In addition, catches have risen in the last few years to levels well beyond the precautionary advice. This is not consistent with the harvest strategy, but more importantly for this PI, does suggest a higher probability of the stock being at or below BMSY than suggested in the Kobe strategy matrix projection probability estimates (recent catches have exceeded any catch in the projection). This agrees with the comments that a lower score is more appropriate and therefore an adjustment was made.

PI 1.1.2 Stock rebuilding

Stock specific comments

Scoring Guidepost	Stock/s	Comment
1.1.2.a SG60 A rebuilding timeframe is specified for the stock that is the **shorter of 20 years or 2 times its generation time**. For cases where 2	Western Pacific Bigeye	Issue: the scoring is correct, however the justification is misleading as it implies that SG60 will be met if exploitation levels reduce to below 2012 levels. The authors state: “Unless 2012 exploitation levels are successfully reduced, the stock will not rebuild, so SG60 is not yet met.” This is a technically correct statement, except that the baseline the authors use is inappropriate. It will require taking greater steps than a "reduction in 2012 exploitation levels"

generations is less than 5 years, the rebuilding timeframe is up to 5 years.		to achieve meaningful stock rebuilding. Catches need to be reduced to far less than the 2012 levels. The way that the justification is currently worded, it implies that the Western Pacific Bigeye stock will be fine, sufficient to meet SG60, if exploitation levels are below 2012, which they aren't as 2012 levels were already too high.
Response (Paul Medley and Joe Powers): No score change. We take the point that this is a confusing statement and have adjusted it so that the focus is on the outcome.		

PI 1.2.1 There is a robust and precautionary Harvest Strategy in place

Overarching comments
WWF reviewer'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 an MP or an MP (implicit) and be tested by MSE."

Other relevant MSC definitions are:

Harvest Control Rules - "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.";

Limit Reference Point – "The point beyond which the state of a fishery and/or a resource is not considered desirable and which management is aiming to avoid."; and

Target Reference Point - "The point which corresponds to a state of a fishery and/or resource which is considered desirable and which management is trying to achieve."

Two relevant points from the MSC Fisheries Standard and Guidance:

GSA2.4 Harvest Strategy PI (PI 1.2.1): “The elements of the harvest strategy need to work together. CABs should therefore consider the overall performance of the harvest strategy, and how its elements contribute to allowing the management system to be responsive to the state of the stock.

Key elements of harvest strategies include:
the control rules and tools in place, including the ability of the management system to control effort, taking into account issues such as overcapacity and its causes;”

GSA2.5 Harvest Control Rules & Tools PI (PI 1.2.2): “The HCRs should be scored against their ability to deliver the levels expressed in SIa (consistent with the actual outcomes measured in PI 1.1.1).
At the 60 level, HCRs should be likely to ensure that stocks will be maintained above the PRI.”

On 5 November 2013, the Global Environment Facility approved the five-year “*Sustainable Management of Tuna Fisheries and Biodiversity Conservation in Areas Beyond National Jurisdiction*” (ABNJ Tuna Project), which the United Nations Food and Agriculture Organization (FAO) coordinates. The ABNJ Tuna Project comprises a range of partners, including the five tuna RFMOs, WWF and ISSF. Outcome 1 of the project includes a strong element of Harvest Strategy development. All partners agreed to the project document, which notes the absence of reference points and Harvest Strategies and explicitly states: “there has yet to be general acceptance and implementation of HCRs”.

It is not sufficient to say there is an “Implied” Harvest Strategy for a stock, as has been in used to justify assigning scores for most of the evaluated stocks. Without an adopted (legally binding) Harvest Strategy, a stock cannot be scored. There needs to be a clearly defined Harvest Strategy with clear objectives and the other key elements as defined in the MSC standards.

Considering the above definitions and relevant excerpts, it is clear to WWF that none of the tuna stocks can achieve a score of 60 or higher for PI 1.2.1. Management systems with only the aspect of monitoring but with no defined actions or Harvest Control Rules are being unconditionally passed. Management systems that have no defined actions, but have tenuously analogous situations where ineffective management actions have been taken are used as ‘plausible argument’. For example, it is clear that the Indian Ocean Skipjack would score less than 60 in the current absence of any effective control of fishing mortality. Situations in which there is only monitoring occurring are being justified as a Harvest Strategy and scoring an unconditional pass. Is just monitoring in a management system considered a ‘Harvest Strategy’? The stock being above a B_{MSY} is given as evidence of an effective Harvest Strategy for an unconditional pass. In many cases it is simply the biological attributes of the species that enable stocks levels that are possibly above B_{msy}, rather than any causality of having a Harvest Strategy achieving its objectives. Stocks may be above B_{msy} reference point due to the vagaries of history, for example piracy in the Indian Ocean. However, even those stocks that failed PI 1.1.1 (stock status) (Western Pacific Bigeye and Indian Ocean Albacore) were given a pass for the PI 1.2.1. 60 Scoring Guidepost (SG).

As the ISSF Evaluation authors, “None of the tuna fisheries have yet implemented a well-defined harvest control rule, and therefore they have difficulty scoring above 60, the minimum requirement to pass MSC certification.” These systems lack a critical aspect of precautionary management as they do not define the ‘action to be taken’. Without Harvest Controls rules, a key element of a Harvest Strategy is missing. While Harvest Control Rules have been inferred from Conservation and Management Measures, there no measures specifically linked to adopted target and limit reference points. Without reference points, by the MSC definition, you cannot have a Harvest Control Rule. If the authors would like to see the assessment team present evidence of Harvest Control Rules.

In this context, it is therefore impossible for WWF to consider that any of the stocks could achieve an 80 score for PI 1.2.1.a, yet a number of the assessments in this report score 80 where there is no ‘combined’ monitoring and management. For a stock to meet the SG80 score PI 1.2.1a, “The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80”. If one key element is missing, in this case a Harvest Control Rule, then the elements are not all there to work together.

WWF therefore suggests the authors did not conform with MSC requirements as they 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 Fisheries Certification Requirements and Guidance v2.0: MSC-MSCI Vocabulary – Normative).

In addition, it is unclear how a stock can meet the SG60 for PI 1.2.1.a if the stock does meet PI 1.1.1. All of the 1.2.1.a Guideposts relate to “achieving stock management objectives reflected in PI 1.1.1 SG80”, i.e. the status of the stock. Indian Ocean Albacore and Western Pacific Bigeye fail PI 1.1.1, the relevant RFMOs clearly cannot have Harvest Strategies in place that are meeting stock sustainability objectives. We would therefore expect these two species to fail the 1.2.1.a 60 Guidepost, not meeting the 60 Guidepost. Likewise, Eastern Pacific Bigeye, and Atlantic Yellowfin, Atlantic Northern Albacore, Atlantic Southern Albacore and Atlantic Mediterranean Albacore do not meet the PI1.1.1 80 Guidepost, and therefore should not meet the PI 1.2.1.a SG80.

Regarding 1.2.1.b, currently there are no subsequent management actions that have been tested by management strategy evaluation or any other evaluation.

In reference to 1.2.1.c, it is not possible to determine whether current monitoring is sufficient to determine how a Harvest Strategy is working, unless the operating model of the Harvest Strategy has been developed and the risks and uncertainties in the data and monitoring has been evaluated/tested.

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).

There is also not apparent evidence to demonstrate conformance with the certification requirements:

GSA2.4 Harvest Strategy PI (PI 1.2.1) and GSA2.5 Harvest Control Rules & Tools PI (PI 1.2.2).

General Response (Paul Medley and Joe Powers):

Throughout the comments, links are made between PIs. For example it states “In addition, it is unclear how a stock can meet the SG60 for PI 1.2.1.a if the stock does [not] meet PI 1.1.1.”. Separate PIs exist to deal, as far as possible, with separate issues – otherwise there would be one PI. Having said that, this PI is a particular problem in terms of separating what is scored compared to all other PIs and an element of “double-scoring” is often used to interpret SGs. We have tried to avoid this. For example, good stock status does not automatically show the harvest strategy is working – often status cannot be shown to be directly due to management action.

More generally, the lack of any attempt to separate PI scores is not MSC methodology and is unhelpful. As we understand it, the interpretation of the MSC methodology used in the comments above would also make it impossible to use MSC scoring as a tool to monitor any improvements, which is one of the objectives for this whole exercise.

It is not true to say the tuna HS overall has passed without conditions. All the fisheries would have and have had a condition on setting a HCR, but this is not considered directly under this PI.

The HS is a process which clearly exists for most tuna fisheries. Mediterranean albacore provides an example where there is not one. A harvest strategy does not have to be “legally binding”, whatever that entails. The only real argument is whether it is effective or not. For most tuna fisheries, it is not.

The comment on 1.2.1c is inconsistent with the comment on 1.2.1a – that is the WWF reviewers are using monitoring information to determine whether the HS is working, pointing out they do not believe that it is. Generally, there are reviews and a large number of documents based on monitoring data, and it is possible to ascertain where the HS is or is not working.

However, as found for the WCPFC stocks, there is an argument to re-assess the HS and whether they are achieving their objectives. Specifically it seems to me that the evaluation and response cycle seems slow. This might not be a problem except that the target exploitation levels do not seem to take any account of this or other issues, but seem to assume a very precise estimate of MSY. This has become more apparent as RFMOs are forced to define what they mean by various management reference points and it is unclear whether RFMOs level of precaution is consistent with MSC’s requirement.

The central point, that the lack of a well-defined HCR prevents these stock meeting the MSC standard, is absolutely clear and agreed.

Stock specific comments

Scoring Guidepost	Stock/s	Comment
1.2.1.a SG60 The Harvest Strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	Western Pacific Bigeye, Skipjack, and Yellowfin	Issue: noting that there are no Harvest Strategies, here is further evidence that 1.2.1.a SG60 for the Western tuna stocks has not been met. At its annual Commission meeting in December 2014, the Western and Central Pacific Fisheries Commission committed to a plan to develop measures. This again confirms that even the RFMO not consider Harvest Strategies to exist.
Response (Paul Medley and Joe Powers): No score change. This comment needs more explanation. Measures are part of a harvest strategy, not a strategy in themselves. Measures already exist, but are clearly not been fully effective in a number of stocks. Developing new measures to address issues that have been detected seems to illustrate a harvest strategy does exist. There is still a question whether it can be expected to achieve management objectives.		
1.2.1.a SG80 The Harvest Strategy is responsive to the state of the stock and the elements of the Harvest Strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	Indian Ocean Bigeye, Skipjack, and Yellowfin; Eastern Pacific Bigeye, Skipjack, and Yellowfin; North Pacific Albacore and South Pacific Albacore; Atlantic Bigeye and Yellowfin; North Atlantic Albacore and South Atlantic Albacore	Issue: noting that there are no Harvest Strategies, the SG80 score rationale does not address PI 1.2.1.a. The rationale for the stocks that are reported to meet SG80, state up front that the “Harvest Strategy is implied”. There is no way that an implied Harvest Strategy is good enough to meet an 80 score. It is already impossible for WWF to consider that any of the stocks could achieve an 80 score for PI 1.2.1.a, as there is no ‘combined’ monitoring and management. For a stock to meet the SG80 score PI 1.2.1a, “The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80”. If one key element is missing, in this case a Harvest Control Rule, then the elements are not all there to work together. A Harvest Strategy cannot be implied.

Response (Paul Medley and Joe Powers): No score change, except for specific fisheries as outlined below. We agree the term “implied” is wrong and have changed it. However, the argument is inconsistent. Either there is no recognised harvest strategy, or the elements of the harvest strategy are not working together. This leads to a more confusing argument from the WWF reviewers. We agree, whether the elements are working together within RFMOs is of concern.		
1.2.1.a SG80 The Harvest Strategy is responsive to the state of the stock and the elements of the Harvest Strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	Eastern Pacific Bigeye	Issue: noting that there is no Harvest Strategy, the rationale for PI 1.2.1.a SG80 needs to take into account all of the facts associated with a multispecies fishery. The authors note that the Inter-American Tropical Tuna Commission Resolution (C-13-01-Tuna-conservation-2014-2016), which limits fishing for larger vessels includes “…annual Bigeye catch limits for longline”. These management measures were essentially designed to conserve the stock of Bigeye in the Eastern Pacific Ocean, however as the tuna fishery is a multispecies fishery, it was expected that they also serve to conserve stocks of Yellowfin and Skipjack. Careful consideration of this Harvest Strategy is required to ensure it is indeed sufficient to maintain Bigeye populations at optimal levels. The issue is that in the Eastern Pacific Ocean there are unresolved issues that threaten the sustainability of all stocks, especially Bigeye, because in recent years the highest proportion of juvenile Bigeye and Yellowfin tuna are caught using Fish Aggregating Devices. The problems of fishing overcapacity and the use of Fish Aggregating Devices with no management measures are issues not fully considered under current management.
Response (Paul Medley and Joe Powers): No score change. C-13-01 includes, among other things, provision for managing FADs and other activities designed to address various concerns. This is evidence of response to factors that affect the sustainability of these fisheries. Some text has been added to the report explaining this.		
1.2.1.b SG80	Western Pacific Bigeye	Issue: noting that there are no Harvest Strategies, it seems there is an error in the scoring.

The Harvest Strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.		The authors state: “However, given the status of the stock and the discussion above, the Harvest Strategy has not been meeting its objectives, so there is no specific evidence of success yet. It has yet to be shown that the management system can maintain stock at the target level (B>BMSY, F<FMSY), which does not meet SG80.” It seems that Powers and Medley meant to score Western Pacific Bigeye at the SG60 level, which is said was met, not the SG80 level. PI 1.2.1.b SG60 is “The Harvest Strategy is likely to work based on prior experience or plausible argument." It is not logical or plausible that an implied Harvest/Management Strategy that after being in place for 10 years has resulted in a population plummeting to <16% of virgin biomass in any way even demonstrates prior experience indicating a likelihood of success. It is bewildering, especially with respect to Pacific Bigeye, that the assessors can suggest that Western Pacific Bigeye even meets SG60, much less the SG80 requirement that "evidence exists that it is achieving its objectives”.
Response (Paul Medley and Joe Powers): The score has been corrected: it meets SG60 only, not SG80. The harvest strategy is to reduce exploitation to FMSY, which is expected to result in the achieving target. “Expected” in this context is pretty weak and no time frame is specified. The lack of a time frame is covered under PI 1.1.2.		
1.2.1.b SG80 The Harvest Strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	Western Pacific Yellowfin, Skipjack and Bigeye	Issue: noting that there are no Harvest Strategies, evidence is not presented to support meeting SG80 for PI 1.2.1.b. The authors state: “Evidence exists that the current constraints on fishing mortality are probably adequate to maintain the stock above B_{MSY}”. Firstly, “Evidence” is not elucidated, and secondly, “Probably adequate” is a guess that the Harvest Strategy is achieving its objectives. Given the continuing precipitous decline in stock level we could be hearing alarm bells on this stock very soon. Thus, the “evidence” is tenuous.

		In addition: *Nonconformance with MSC requirements* SA2.4.1.2 ""Tested" at SG80 to mean the involvement of some sort of structured logical argument and analysis that supports the choice of strategy."
Response (Paul Medley and Joe Powers): No score change. Evidence has been added to the report.		

Indian Ocean Tuna Commission

Scoring Guidepost	**Stock/s**	**Comment**
1.2.1.a 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 PI 1.1.1 SG 80	Indian Ocean Bigeye, Skipjack and Yellowfin stocks	Issue: noting that there are no Harvest Strategies in place, to satisfy PI 1.2.1.a to the 80 level it assumed that a Harvest Strategy is actually in place that meets the MSC definition. To meet PI 1.2.1.a to the 80 level (which the PI 1.2.1 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 the Indian Ocean Tuna Commission (IOTC) for determining a management action in response to changes in indicators of stock status with respect to reference points In IOTC Resolution 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. 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 Resolution 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. Resolution 13/10: Is not a requirement for the management bodies to adopt Harvest Control Rules before stocks decline below B_{MSY}. Does not explicitly require action in response to some pre-defined trigger level. Further commentary on Resolution 13/10 (On Interim Target and Limit Reference Points and a Decision Framework) is provided in response to PI 1.2.2.a below. In 2012, 2013 and 2014 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 (IOTC–2012–SC15–R[E], IOTC–2013–SC16–R[E], and IOTC–2012–SC15–R[E]). 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 authors 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.

		The rationale for Indian Ocean Yellowfin refers to Resolution 12/13 (For the conservation and management of tropical tunas stocks in the IOTC area of competence). However, available evidence suggests that IOTC members are not willing to agree on the use of spatial closures as a tool in controlling exploitation, with the removal of Resolution 12/13 at the request of the members. It is unlikely any new agreement on spatial closures would be agreed on by members at the scale required to be effective. Further commentary on Resolution 13/10 (On Interim Target and Limit Reference Points and a Decision Framework) is provided in response to PI 1.2.2.a below.
Response (Paul Medley and Joe Powers): Indian Ocean Yellowfin 1.2.1a score reduced from SG80 to SG60 The lack of a well-defined HCR is covered under 1.2.2. Resolution 13/10 doesn't mention "harvest strategy", only HCRs and is an intention to do something. Reference points are not scored now in CR2.0, so this resolution is not relevant until a well-defined HCR is proposed. Any MSE would provide evidence then whether or not it meets 1.2.2 SG80s. Yellowfin catches above the scientific advice is a concern. This already reduced the score for PI1.1.1. However, there is a question whether the HS is precautionary enough or is showing a timely response. We accept that further evidence is required that the stock will not be depleted, and text has been added and scoring reduced. The reference in the report to the closed areas has been corrected.		
1.2.1.b SG80 The Harvest Strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	Indian Ocean Yellowfin	Issue: noting that there are no Harvest Strategies in place, evidence is not presented to support meeting SG80 for PI 1.2.1.b. As this is an important point, if they exist, the measures in currently in place to constrain effort need to be outlined in detail. We submit that the only evidence available indicates that advice from the Scientific Committee is ineffective in controlling harvest of the Yellowfin tuna stocks, i.e. advice provided by the Indian Ocean Tuna Commission Scientific Committee is not actioned by the

		Indian Ocean Tuna Commission. 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 Indian Ocean Tuna Commission has been overfished and subject to overfishing and in the red quadrant of the Kobe plot for a number of years (e.g. Report of the 16th Scientific Committee; Report of the 17th IOTC Scientific Committee) clearly demonstrates the inability of the Indian Ocean Tuna Commission, in the absence of any Harvest Strategy supported by defined Harvest Control Rules to respond effectively to a stock under severe pressure. WWF maintains 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. In addition: *Nonconformance with MSC requirements* SA2.4.1.2 ““Tested” at SG80 to mean the involvement of some sort of structured logical argument and analysis that supports the choice of strategy.”
Response (Paul Medley and Joe Powers): No score change. Text has been added. The HS requires F<=FMSY, and catches to be set accordingly. Testing is provided by short term projections (simulations). Time series plots of the stock assessment show the decline in stock status has been halted and as yet the stock appears to be above MSY. If appropriate action is taken, which IOTC members have undertaken to do, then this PI is met. If they fail to implement their own HS, then it is not. While I share a lack of faith in RFMOs generally, the MSC methodology scores the current situation, otherwise it would be possible to score fisheries as always passing or never passing dependent on what one subjectively thinks might happen in the future.		

PI 1.2.2 There are well-defined and effective Harvest Control Rules in place

Overarching comments

Consistency in scoring is good, however WWF considers it inappropriate to allocate 60 scores to any of the stocks for PI 1.2.2. As outlined above, both WWF and ISSF are partners in the ABNJ Tuna Project, which confirms states: "there has yet to be general acceptance and implementation of HCRs". No stocks should pass PI 1.2.2, as no Harvest Control Rules are "in place or available" for any of the assessed stocks. On 5 November 2013, the Global Environment Facility approved the five-year "*Sustainable Management of Tuna Fisheries and Biodiversity Conservation in Areas Beyond National Jurisdiction*" (ABNJ Tuna Project), which the United Nations Food and Agriculture Organization (FAO) coordinates. The ABNJ Tuna Project comprises a range of partners, including the five tuna RFMOs, WWF and ISSF. Outcome 1 of the project includes a strong element of Harvest Strategy development. All partners agreed to the project document, which notes the absence of reference points and Harvest Strategies and explicitly states: "there has yet to be general acceptance and implementation of HCRs".

If the authors can clearly demonstrate an ability to limit fishing mortality on [any of the] stocks considered in this report, as they claim exists, then 60 in the RFMOs where evidence is provided may be warranted. WWF does not believe that cannot demonstrated for any RFMO (jurisdiction) that "management can and will apply such controls when they are needed". As the authors states, "for tuna RFMOs, …, management is mixed with adequate responses in some cases and inadequate in others.". Therefore, how is it possible that we can predict whether a RFMO will respond adequately or inadequately in future. Evidence to date, suggests that RFMOs are most likely to not act, for example for Indian Ocean Albacore or Western Pacific Bigeye, and/or to introduce ineffective measures when faced with a sustainability crisis.

As there are no informal/formal/explicit/implicit rules or actions in any of the fisheries under the relevant RFMO, but the stock is above B_{msy}, it is not possible to interpret that there are "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" "in place or available".

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).

There is also not apparent evidence to demonstrate conformance with the certification requirements:
GSA2.4 Harvest Strategy PI (PI 1.2.1) and GSA2.5 Harvest Control Rules & Tools PI (PI 1.2.2).

Response (Paul Medley and Joe Powers): Generally, RFMOs have shown that they are able to limit fishing mortality, and in most cases have reduced or halted declines in stock size. Evidence that they are able to rebuild stocks is lacking. Reasonable actions have been taken for a number of stocks, but have not clearly been shown to be effective and the response is slow. If the fishery cannot implement the requirements for SG80, the fishery does not meet the MSC standard. A full assessment would need to provide evidence that the RFMO would respond appropriately, and that evidence is mixed. However, we do not know of a jurisdiction where there is not evidence both for and against a "generally understood" HCR working.

Stock specific comments

Scoring Guidepost	Stock/s	Comment
1.2.2.a SG60 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.	All stocks	Issue: The score assigned to PI 1.2.2(a) was arbitrary insofar as the team accepted a Harvest Control Rule as being 'available' when there is clear objective evidence showing that the HCR does not meet MSC's criteria for being defined as such. None of the justification here meets the text of PI 1.2.2.a. There is a complete disconnect between saying "there is no well-defined harvest control rule and therefore there is no specific plan of control if the stock size falls below the maximum sustainable yield level" and "Harvest Control Rules are still in the development phase", with the conclusion that SG60 is met (i.e."HCRs are in place or available that are expected to reduce the exploitation rate as the PRI is approached").
Response (Paul Medley and Joe Powers): No score change. The report text has been improved to try to address these points. Note that even if there is a well-defined HCR, there is no final guarantee that the members would keep to it. We don't think you could make it "legally binding" for various reasons, not least because it might not work and it could then make overfishing legally binding. On this basis, as we understand the WWF reviewers' comments, if you don't believe it will be kept to, then the RFMOs could never pass and MSC becomes irrelevant.		
1.2.2.b SG60	All stocks	Issue: suggest text amendment to reflect the facts. Suggest that instead of saying "because the HCR has not been defined well enough to do so.", simply say, "because there is not an HCR."

Response (Paul Medley and Joe Powers): No score change. This interprets a “well-defined HCR” as a requirement at SG60, whereas it is not. “HCR” was coined as a general term for linkages between determinations of status and management actions taken. It is now considered that without a well-defined HCR, these are weak and it is not possible to audit or test them very well.		
1.2.2.c SG60 There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation.	Western Pacific Skipjack and Yellowfin	Issue: noting that there are no Harvest Control Rules, the justification for PI 1.2.2.c SG60 contains inaccuracies. WWF questions the statement "The current level of control, mainly through access rights and licensing, has resulted in sustainable catch levels for [Western Pacific Skipjack and Yellowfin]", on the basis that current overcapacity due to inadequate limits through access and limited licensing leading steadily declining stocks resulting in overfishing and an overfished state of the stock.
Response (Paul Medley and Joe Powers): No score change. Neither stock is overfished according to the stock assessment, so we don’t understand this point. Overcapacity is an incentive for unsustainable fishing previously covered in P3 but now removed in CR2.0 because the SGs were useless (in our opinion).		

Indian Ocean Tuna Commission

Scoring Guidepost	Stock/s	Comment
1.2.2.a SG60 **Generally understood** HCRs are **in place or available** that are	All Indian Ocean stocks	No Harvest Control Rules are in place or exist Issue 1: the SG60 score assigned to PI 1.2.2.a cannot be met, as the authors accepted a Harvest Control Rule as being ‘available’ when there is clear objective evidence showing that there are no rules or measures in the Indian Ocean Tuna Commission that would meet the MSC’s criteria for being defined as Harvest Control Rules.

expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.		WWF expects to see Powers and Medley present evidence of Harvest Control Rules as per the 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." As the authors themselves state in the justification for each Indian Ocean stock for 1.2.2.c, "there are as of yet no harvest control rules at the IOTC level…". There currently are no well-defined pre-agreed rules or actions in place, available, 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 in place or available, the assessors must provide objective evidence of these. *Nonconformance with MSC requirements* There is not apparent evidence to demonstrate conformance with the following certification requirements: "SA2.5.3 Teams shall recognise 'available' HCRs as 'expected to reduce the exploitation rate as the point of recruitment impairment is approached' only in cases where: HCRs are effectively used in some other UoAs, that are under the control of the same management body and of a similar size and scale as the UoA; or An agreement or framework is in place that requires the management body to adopt HCRs before the stock declines below B_{MSY}." "GSA2.5.2 –GSA2.5.5: Under clause 2.5.3.a, teams may provide a rationale that this could reasonably be 'expected' for the target species in cases where HCRs are currently being 'effectively' used by the same management agency on at least one other species of similar importance (i.e., of a similar average catch levels and value)." **<u>Issues 2 - 4</u>** The following comments relate to all of the Indian Ocean stocks as the justifications for Indian

		Ocean Albacore, Yellowfin, Bigeye and Skipjack are all the same: "There is evidence of intention to reduce harvest should depletion occur and the scientific advice is prepared to make recommendations to that effect if it were to occur, meeting SG60. Controls include limits on capacity (Resolution 12/11), and conservation measures for all tropical tunas (Resolution 14/02). However, there is an interim decision framework with reference points (Resolution 13/10) for all tunas and swordfish. This includes the intention to develop harvest control rules (HCRs)…" <u>Resolution 12/11 (On the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating Non-Contracting Parties)</u> <u>Issue 2:</u> the score assigned to PI 1.2.2(a) in part relies on intended or future required action in Resolution 12/11, not something that is in effect. Resolution 12/11 covers tropical tunas, swordfish and Albacore stocks. 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 as, "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 crucially, the Resolution does not contain a single paragraph limiting capacity to any particular level, stock, fleet, or other unit of management. 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 narrow scope of Paragraph 4, which is where Cooperating Parties and Cooperating Non-Contracting Parties (CPCs) may change 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. Further, Resolution 12/11 is only "applicable during the years 2012 and 2013" (para. 10). The

		Resolution also states that “the Commission shall review its implementation at the 2014 IOTC Session.”. As explained under 1.2.2.c below, this review has not occurred. Resolution 14/02 (For the Conservation and Management of Tropical Tunas Stocks in the IOTC Area of Competence) Issue 3: the score assigned to PI 1.2.2(a) was arbitrary as the scoring rationale refers to a Resolution 14/02 as evidence, although that measure does not require what is described. Resolution 14/02 does provide any controls, only requires 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.” Resolution 14/02 supercedes Resolution 12/13 (For the conservation and management of tropical tunas stocks in the IOTC area of competence). Resolution 12/13 contained a deadline for the Commission to “adopt an allocation quota system or any other relevant measure for the Yellowfin tuna and Bigeye tuna at its plenary session in 2012”. Resolution 14/02 has no deadline, and discussions appear to have stalled with the last formal discussion held at the second Technical Committee on Allocation Criteria in February 2013. Resolution 13/10 (On Interim Target and Limit Reference Points and a Decision Framework) Issue 4: the score assigned to PI 1.2.2(a) was arbitrary insofar as the scoring rationale conflates a non-binding ‘resolution’ with an agreement that explicitly requires action. Indian Ocean Tuna Commission Resolution 13/10: Is not a requirement for the management bodies to adopt Harvest Control Rules before stocks

		decline below B_{MSY}. Does not explicitly require action in response to some pre-defined trigger level. Powers and Medley note that Resolution 13/10 has an interim decision framework with reference points is an agreement/framework that has the intention for the Indian Ocean Tuna Commission to adopt Harvest Control Rules. However, Resolution 13/10 is simply a resolution requiring the Scientific Committee to provide advice using some suggested (interim) reference points. The Resolution presents a range of interim figures and a decision framework for use by the Indian Ocean Tuna Commission 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 Indian Ocean Tuna Commission. While the Resolution does instruct the Scientific Committee to assess and develop potential Harvest Control Rules in the (undefined) future, there is no timetable or relationship with stock status. Until those are adopted as a binding resolution by the Indian Ocean Tuna Commission, there are no Harvest Control Rules in place (generally understood or otherwise) for any species under the management mandate of the Indian Ocean Tuna Commission. This is a simple statement of fact.

Response (Paul Medley and Joe Powers): No score change.

Issue 1: This point has already been made. SG60 and SG80 draw a distinction between “Generally understood” and “well-defined”. The generally understood HCR varies for each stock, but each stock has a precautionary catch recommended from the stock assessments which the management system needs to achieve. Without this, how can the scientists be providing precise scientific advice?

Probably, most important to this issue, is whether HCRs are “in place” or “available”. What the difference between an “in place” and “available” is not really defined in relation to “generally understood”. If generally understood HCRs are considered as “available” only, then all stocks would fail (<60) if their stock status was below MSY (SA2.5.2). This is a shift in the original meaning of this PI, but since these stocks fail anyway, it’s an academic change. Frankly, it would now be better to drop the “generally understood”, so that a “well-defined” HCR would be required within 5 years of certification. Or shift the SG80 to SG60 as the requirement is much clearer, so a well-defined HCR is a requirement before certification.

Our understanding of a “generally understood” HCR is one that is applied by the different parts of the management system, but is not explicitly written down. Without this type of HCR, scientific advice becomes very vague (e.g. USA fisheries before NS1 was adopted and most developing country fisheries now). For it to be in place, it should be possible to see when it is not being applied (i.e. it must be auditable). So, for IOTC yellowfin, we know the catches are exceeding levels consistent with the harvest strategy/HCR/management objectives. Issue 2: The resolution is weak, but the main objective is to limit fishing effort. The main problem is the tension between developing countries which wish to increase capacity, which needs to be done at the expense of capacity which already exists, mainly held by developed countries. The requirements on monitoring and recording fishing activity also provide a control on fishing activity and prevent “open access”. What the system lacks is a well-defined control as required by SG80. Issue 3: Resolution 14/02 also is very weak and that point is now made in the report. It does not contribute much beyond a statement of intention. And it certainly stops any chance of meeting SG80 until it is replaced. Other resolutions show what might be available as controls. The text now references the compendium of active controls, which are extensive and include catch and effort limits. Because they are a compendium of responses to perceived problems, they are evidence of available controls only. Issue 4: Resolution 13/10 illustrates progress towards achieving an HCR only. It doesn’t increase any scores.		
	Indian Ocean Yellowfin	Issue 5: the score assigned to PI 1.2.2(a) was arbitrary insofar as the team accepted a Harvest Control Rule as being ‘available’ when there is clear objective evidence showing that the HCR does not meet MSC’s criteria for being defined as such. The Yellowfin tuna stock is clearly predicted to be reduced below B_{MSY} in the next five years (IOTC–2013–SC16, Report of the Sixteenth Session of the IOTC Scientific Committee), thus not fulfilling the MSC requirement specified in SA2.5.2(a). Given the fact that no previous Harvest Control Rules have been implemented for any stock under Indian Ocean Tuna Commission management, and given the poor record of other RFMOs, the assessment team has failed to provide objective evidence showing that Indian Ocean Tuna Commission can and will act effectively and in a timely fashion when needed. Additionally, the Yellowfin tuna fishery is not a ‘lightly exploited’ fishery, nor is it in the

		development stage. Therefore it cannot be claimed to meet MSC's criterion of an 'arrangement' (to put HCRs in place) as described in GSA2.5.2-GSA2.5.5. *Nonconformance with MSC requirements* There is not apparent evidence to demonstrate conformance with the following certification requirements: "SA2.5.2 In scoring issue (a) at the SG60 level, teams shall accept 'available' HCRs (instead of HCRs that are 'in place') in cases where: Stock biomass has not previously been reduced below the MSY level or has been maintained at that level for a recent period of time that is at least longer than 2 generation times of the species, and is not predicted to be reduced below B_{MSY} within the next 5 years;" "GSA2.5.2 –GSA2.5.5: In all cases, there should be a real confidence backed up by 'evidence' (as reported against SI1.2.2c) that the management agency can and will act effectively and in a timely fashion when needed (such evidence being as described in SA2.5.5)."
Response (Paul Medley and Joe Powers): Issue 5: The stock biomass has not already been reduced to below the MSY, but unless action is taken, it is likely to be projected as below MSY based on the 2012 assessment. This statement would be true for all tuna stocks at MSY, they would now fail this SI if the "generally understood" HCR was considered "available". However, we would need to know what that means as it doesn't make much sense to me. This assumes they are "in place". The only way we can understand "available" is, for example, the various rules and tools were established as "generally understood" for species A, but not yet adopted for species B. In this case, you could see them being implemented/developed rapidly if management for species B was still being developed. This doesn't really apply to these tunas, although it could to other tuna-like species which are not yet managed.		
1.2.2.c SG60 There is **some evidence** that tools used **or available** to implement HCRs are		Issue 1: noting that there are no Harvest Control Rules, the score assigned to PI 1.2.2(c) was arbitrary insofar as the assessment did not include in their scoring rationale a description of evidence for the Harvest Control Rules being used effectively. In fact, available evidence seems to indicate that the opposite is true.

appropriate and effective in controlling exploitation.		Given the fact that no previous Harvest Control Rules have been implemented for any stock under Indian Ocean Tuna Commission (IOTC) management, and given the poor record of other RFMOs, the assessment team has failed to provide objective evidence showing that Indian Ocean Tuna Commission can and will act effectively and in a timely fashion when needed. There is no evidence of any effective use of Harvest Control Rules by the Indian Ocean Tuna Commission for any other tuna stocks. Therefore the Harvest Control Rule cannot be claimed to meet MSC's criterion outlined in SA2.5.5a with respect to being "effectively" used in other named UoAs also managed by the same management body, or criterion SA2.5.5b. In fact, the Yellowfin tuna stock is clearly predicted to be reduced below B_{MSY} in the next 5 years (IOTC–2013–SC16, Report of the Sixteenth Session of the IOTC Scientific Committee), thus not fulfilling the MSC requirement specified in SA2.5.2(a). *Nonconformance with MSC requirements* There is not apparent evidence to demonstrate conformance with the following certification requirements: "SA2.5.5. In scoring issue (c) at the SG60 level, where HCRs are recognised as 'available', teams shall include in their rationale: Evidence that HCRs are being 'effectively' used in other named UoAs, also managed by the same management body, including the basis on which they are regarded as 'effective'; or A description of the formal agreement or legal framework that the management body has defined, and the indicators and trigger levels that will require the development of HCRs." "GSA2.5.2 –GSA2.5.5: In all cases, there should be a real confidence backed up by 'evidence' (as reported against SI1.2.2c) that the management agency can and will act effectively and in a timely fashion when needed (such evidence being as described in SA2.5.5)." <u>Issue 2:</u> The score assigned to PI 1.2.2.c was arbitrary insofar as the authors seem to infer

		that the tools 'available' are 'appropriate and effective in controlling exploitation', without providing a list of these tools or 'evidence' of their effectiveness. Powers and Medley state "The tools that the IOTC have available include TACs, area access and other measures." However, the actual tools are not described and there is no evaluation or evidence provided to demonstrate their effectiveness to "control exploitation"/"achieve the exploitation levels". In addition to the current decline of Indian Ocean Yellowfin tuna, and despite not having a list of tools to respond to, the following provides evidence that where tools might be construed as available or being used in the Indian Ocean Tuna Commission that they not effective or used effectively. *Limiting Fishing Capacity and Effort* Resolution 12/11 (On the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating Non-Contracting Parties) covers tropical tunas, swordfish and Albacore stocks. 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 as, "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 crucially, the Resolution does not contain a single paragraph limiting capacity to any particular level, stock, fleet, or other unit of management. 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. Further, Resolution 12/11 is only "applicable during the years 2012 and 2013" (para. 10). The Resolution also states that "the Commission shall review its implementation at the 2014 IOTC

		Session.". The Commission was presented with paper IOTC–2014–S18–09E] (Current Conservation and Management Measures that require action by the Commission in 2014) at its meeting in 2014. The paper highlighted Resolution 12/11's expiry, and had the "Suggested action: To consider extending the applicability of the Resolution for an additional period, while awaiting the review which is scheduled to take place in 2014.". The 2014 Commission meeting report states: "The Commission NOTED paper IOTC–2014–S18–09 outlined previous decisions contained in IOTC Conservation and Management Measures, on which the Commission agreed to action at the 18th Session in 2014, and thanked the Secretariat for its preparation. Where possible, any outstanding issues shall be dealt with during the current Session and in the new or revised Conservation and Management Measures adopted." (IOTC–2014–S18–R[E], para 115). The Commission did not address the expiry of Resolution 12/11. To make matters worse, the Commission was also presented with the same suggestion in 2013 (IOTC–2013–S17–08[E]), so had had time to consider the issue and to ensure a review was undertaken in 2014. This complete inaction by the IOTC, despite prompting by the Secretariat, is clear evidence that the IOTC will not necessarily act, let alone take effective action. 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, from the 2014 Compliance Committee, 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 authors suggest that the available tools in the 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. Table 1 in IOTC-2014-CoC11-05 REV1[E] (Report on the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating non-Contracting Parties) clearly shows an estimated (due to lack of reporting by a number of countries) total capacity in 2013 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. 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. <u>Area Closures (area access)</u> The assessment team notes that area access is a tool available to the IOTCs. In fact it is a tool that has been recently used. Closures are an effective and appropriate tool to control exploitation. However, available evidence suggests that IOTC members are not willing to agree on the use of spatial closures as a tool in controlling exploitation, with the removal of Resolution 12/13 at the request of the members. It is unlikely any new agreement on spatial closures would be agreed on by members at the scale required to be effective. Unfortunately the sole spatial/temporal controls agreed to by the Commission relating to the conservation of Yellowfin tuna stocks were removed from Resolution 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 cannot 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. <u>Total Allowable Catches (TAC) and Quota Allocation</u> MSC certification should not be based on somewhat hopeful projections of what may be implemented at some undefined future date. The authors attest that TACs are a tool available to the IOTC. 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 (For the conservation and management of tropical tunas stocks in the IOTC area of competence) 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 have been removed altogether). 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. <u>Albacore</u> The rationale for PI 1.2.2.c for all Indian Ocean stocks mentions: "A level of control to respond

		to excess fishing pressure has not been demonstrated partially because biomass has remained above that which would produce MSY." It is clear however, that the IOTC was not implementing any tools to stop overfishing (control exploitation). Powers and Medley provided a list of three Resolutions in its rationale for PI 1.2.2.a (Resolutions 12/11, 14/02 and 13/10), which it said show intent to use Harvest Control Rules. These rules therefore 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 three 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. We therefore note with some concern that although this issue at the SG60 level could be satisfied (if Harvest Control Rules existed) by providing evidence that tools used to implement Harvest Control Rules are (present tense) appropriate, Powers and Medley name only two tools (TAC and are access). TACs may only (perhaps) be implemented in the future and spatial closures (area access) were used ineffectively. The evidence to date shows lack of will by the IOTC to adopt of adaptively manage measures that could control exploitation. Therefore SG60 is not met. *Nonconformance with MSC requirements* There is no evidence to demonstrate conformance with the following certification requirements: "7.10.6.2 The rationale shall make direct reference to every scoring issue and whether or not it is fully met." "SA2.5.6 In scoring issue (c) for "evidence" teams shall include consideration of the current

		levels of exploitation in the UoA, such as measured by the fishing mortality rate or harvest rate, where available." "GSA2.5.2 –GSA2.5.5: Evidence that current F is equal to or less than FMSY should usually be taken as evidence that the HCR is effective."

Response (Paul Medley and Joe Powers): No score change.

Issue 1: Previous remarks also apply here, although whether tools will be effective is a problem. There is evidence that various controls can affect these fisheries, but this only amounts to some evidence. Catches have been limited by flag states (such as Taiwan). Area closures can be enforced for larger vessels with VMS anyway. Catch documentation schemes allow some control. These are at least applied for some fisheries and available for all. There is no reason in principle, why effort could not be significantly reduced if a decision was made to do so.
We are not aware of evidence of resolutions that have been ignored. Resolutions have been withdrawn or objected to, but with some reason and through applying due process. For example, as we understand it, India was unable to comply with some resolutions due to a lack of technical capacity and nature of its fisheries. If resolutions limiting catch were passed by IOTC, but then led to no effective catch reductions, then the fishery would not meet this SI.
Issue 2: It is true that detailed evidence for compliance is not reviewed. However, a key test, and more important than those supplied here, is whether SSB and fishing mortality are maintained at required levels. For example, poor compliance can be dealt with through better policing, or setting more precautionary targets/exploitation levels to ensure the stock is not overfished.

Limiting Fishing Capacity and Effort
This is orientated towards not allowing increases in effort rather than reductions. Nevertheless, fisheries have shown that effort and mortality can be reduced through controls placed on fleets. Non-compliance with reporting is at least partly due to the inability of many fleets to record and report catches. This is a common problem for small-scale fisheries in developing countries. However, we do not believe that this prevents effective controls. For example, a high proportion of tropical tuna catch is taken by purse seiners, which can be controlled, if IOTC agrees on action to be taken.
Fleet development plans
Like notifications to fish in CCAMLR, these are pretty useless as a management tool, and probably should be abandoned. They encourage countries to stake a claim on fisheries rather than apply good management practice.
Area closures

As indicated actual closed areas have been untested, and it is unclear whether future areas will be agreed in practice. However, if they are big enough and cover main fishing grounds they will reduce fishing effort. Evidence that closures would work comes from general argument, from other oceans and the example of the reduction in fishing opportunities due to piracy in the eastern Indian Ocean. They are not a very precise tool.
TACs
Catch limits are applied for some fleets and species, but it is not likely that they could be applied across all fisheries, not least because catches are not recorded well-enough across all fleets. However, there is no reason catch limits could not be applied for some vessels, and this should be adequate to limit or reduce fishing mortality.

With respect to IO albacore, the fishery already fails on status and absence of rebuilding. This covers the comments. The key point is the management system is probably not applying or recognising sufficient precaution for the MSC standard recognised in scoring the HS PI 1.2.1.

PI 1.2.3 Relevant information is collected to support the Harvest Strategy

Overarching comments
While many or all of the evaluated stocks may have appropriate stock assessments, these assessments need to be viewed in the context of their relevance to Harvest Strategies. As illustrated above (PI 1.2.1 and PI 1.2.2), there are no Harvest Controls Rules in place for any of the 19 stocks, therefore it is not possible to score any of the stocks for 1.2.3.a.

Likewise, while many or all of the evaluated stocks may have appropriate stock assessments, these assessments need to be viewed in the context of their relevance to Harvest Control Rules. As illustrated above (PI 1.2.2), there are no Harvest Controls Rules in place for any of the 19 stocks, therefore it is not possible to score any of the stocks for 1.2.3.b.

To pass the stocks for PI 1.2.3.a and b, Powers and Medley justified their scores on the basis of whether appropriate data and information are available to support the Harvest Control Rule or Harvest Strategy, IF Harvest Control Rules existed. For example: Western Pacific Skipjack: “That information is sufficient to determine stock status and therefore implement a harvest control rule is clearly demonstrated.”; and Eastern Pacific Bigeye: “Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with best-practice harvest control rules.”

As previously outlined, it is not sufficient to base decisions on “implied” or “intended” measures, except where MSC guidance makes specific allowance for something to be implied (e.g. in PI 3.1.3). Measures must have been formally adopted by RFMOs to be well-defined and well-justified, and also measurable.

Response (Paul Medley and Joe Powers): No score change.

The premise *''While many or all of the evaluated stocks may have appropriate stock assessments, these assessments need to be viewed in the context of their relevance to Harvest Strategies. As illustrated above (PI 1.2.1 and PI 1.2.2), there are no Harvest Controls Rules in place for any of the 19 stocks, therefore it is not possible to score any of the stocks for 1.2.3.a."* is false. The aim of using a scoring methodology is, as far as possible, to separate out the different effects. Otherwise there would be a single PI.

Evidence for adequate data or otherwise comes from scientific reports. These should identify key data that are missing and that prevent stock assessments and therefore effective management. Unfortunately, fisheries data are always poor. As noted in the comment above, stock assessments for many tuna stocks are appropriate and generally adequate to determine stock status – so data are not the limiting factor for these fisheries. Where data are sufficient for stock assessment with adequate precision for an HCR, SG80 is met for 1.2.3. This would be true even if the argument that there is no HCR or HS is accepted. The nuances relate to how much uncertainty is due to a lack of data or poor data and whether this is acceptable or whether the lack of a stock assessment is a problem with the data or with the stock assessment models. Except in a few cases, the data seem not to be the limiting factor for the management of these fisheries.

Stock specific comments

Scoring Guidepost	Stock/s	Comment
1.2.3.a SG80 Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the Harvest Strategy.	Western Pacific Bigeye, Yellowfin and Skipjack	Issue: noting that there is no Harvest Strategy, if there were a Harvest Strategy, the score assigned to PI 1.2.3.a is inflated as there are clear information gaps that affect stock management. The authors state: "Sufficient information (on stock structure, stock productivity, fleet composition), is available to monitor and assess stock status including; tagging data, catch reporting and size-frequency sampling by each fleet and catch-per-unit-effort data from these fleets." A reasonable argument can be made that the information is indeed not sufficient based on the

		large gaps as a result of the failure of four of the largest distant water fishing nations to provide operational data on their fleets. This is highlighted by the Secretariat of the Pacific Community and all other members' continued call for the provision of this information. Therefore "all major fleets" do not report "adequate" information. If the ISSF Evaluation remains silent on this issue, we ultimately give the Asian fleets a pass on not providing this information. There are also some large information gaps and questions regarding the effectiveness and compliance with transshipment monitoring, should be highlighted against a number of the stocks for 1.2.3.a.
Response (Paul Medley and Joe Powers): No score change. It is an important point, not made clear enough in the MSC methodology, that data provision from the UoC should be complete and meet best practice for the fishery. For example, if the overall fleet recording of catches covered 95%, on the one hand 95% of the catch would not prevent a valid assessment, on the other any vessel would need to meet the required best practice before it could be certified (that is, comply with best practice in 1.2.3), so if it was one of the 5% not reporting catches, it could not be certified. This is why there is a SI 1.2.3c requiring good information on all other sources of mortality to separate the UoA/UoC requirements from other non-certified groups. Refusal to comply with any reporting requirements without good reason should lead to failing 1.2.3a or b SG80 or SG60. Text has been added to 1.2.3b make this point.		
1.2.3.a SG80 **Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the Harvest Strategy.	Western Pacific Yellowfin	Issue: noting that there is no Harvest Strategy, if there were a Harvest Strategy, the score assigned to PI 1.2.3.a is ignoring observer coverage implementation rates. The authors state: "In addition, there is high level of observer coverage for some fleets (targets 100% purse seine and 5% longliners)". Saying that observer coverage is (high 100% or 5% depending on the fleet), simply because it is required in a Western and Central Pacific Fisheries Commission measure is misleading, when in fact the actual coverage is only about half that required.

Response (Paul Medley and Joe Powers): No score change. Text has been corrected to reflect this point.		
1.2.3.b Monitoring	All stocks, with specific reference to the Western and Central Pacific Fisheries Commission	Issue: noting that there is no Harvest Control Rule, if there were a Harvest Control Rule, the score assigned to PI 1.2.3.b is inflated as there are clear information gaps that affect stock management. The text of PI 1.2.3.b assumes there is a Harvest Control Rule in place. If there was not this requirement, then WWF would have no substantive overall concern with the assessment and scoring of PI 1.2.3.b for the 19 stocks. This said, as the level of capacity and effort that exists today considering the level of monitoring that is available, including the processing and evaluation capacity, it is highly unlikely that a Harvest Control Rules could be implemented in a way that is responsive enough to address overharvest. In the case of Western and Central Pacific Ocean, describing near 100% observer coverage and other measures in the Purse Seine fleet is insufficient without acknowledging the near complete lack of observer coverage in the Longline fleet, which catches an equivalent percentage of the overall catch.
Response (Paul Medley and Joe Powers): No score change. An observer programme can be useful, but is not necessary for HCRs. A lot of fisheries are sustainable without any observer programmes. HCRs will need to address any resulting uncertainties from a lack of observer coverage however.		
1.2.3.c SG80 There is good information on all	Eastern Pacific Bigeye	Issue: PI 1.2.3.c SG80 should not be met as the assessment did include not all relevant information, which if included demonstrates key information gaps.

other fishery removals from the stock.		Regarding the statement: "…and the United States has had an observer program from the 1970s": There are no observers on vessels under 363 tons, and the observer coverage on longline vessels is currently 5%. This information that is not collected is key to making a comprehensive evaluation of all other removals.
Response (Paul Medley and Joe Powers): No score change. Some observer coverage allows estimates of discarding or depredation. 100% observer coverage is not required (it is not a good MCS tool). Good compliance with reporting and good statistical analysis of the sampling to ensure measures of uncertainty are correctly assessed are more important and more cost effective. A long time series of observer data is useful to help assess any changes in practices, CPUE etc. A time series from the 1970s is unusual. Smaller vessels are not covered for practical reasons, but this should not prevent stock assessments or HCR development.		
1.2.3.c SG80 There is good information on all other fishery removals from the stock.	All Indian Ocean Tuna Commission stocks	Issue: PI 1.2.3.c SG80 should not be met as satisfying the SG80 is not conditional. The justification for each of the Indian Ocean tuna stocks commences with: "IOTC has put considerable effort into the reporting and recording of all tuna catches by the contracting parties. The current level of reporting is adequate given the number of small countries involved and difficulties in monitoring small vessels and activities in pelagic waters well away from the coast." 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 operate industrial scale vessels which are not providing data in compliance with the Indian Ocean Tuna Commission Resolutions. To justify scoring this fishery to SG80 (and therefore passing this PI), Powers and Medley must include a discussion of levels of compliance with the Indian Ocean Tuna Commission Resolutions cited. WWF's comments below regarding 3.2.3b and c for the Indian Ocean Tuna

		Commission clearly demonstrate significant non-compliance with Indian Ocean Tuna Commission Resolutions, including those on data provision. As an example of that lack of 'good information', according to the report of the 16th IOTC Scientific Committee: catches of Yellowfin 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."
Response (Paul Medley and Joe Powers): No score change The definition of "good" here is good enough. Data are missing, but estimates can and are made and none prevent stock assessment or good management as far as we can see. Catch is the most important information. While estimates of annual catch tonnage are better than nothing, the main problem is lack of biological sampling, so size and species composition is poorly estimated. The better the data the more accurate the results, but modern estimation techniques and reasonable assumptions allow most of these problems to be addressed in some way. A lack of data should lead to a lower target exploitation rate for precautionary reasons, but should not stop management.		

PI 1.2.4 Assessment of stock status: There is an adequate assessment of the stock status.

Overarching comments

While many or all of the evaluated stocks may have appropriate stock assessments, these assessments need to be viewed in the context of their relevance to Harvest Control Rules. As illustrated above (PI 1.2.2), there are no Harvest Controls Rules in place for any of the 19 stocks, therefore it is not possible to score any of the stocks for 1.2.4.a.

Stock specific comments

Scoring Guidepost	Stock/s	Comment
1.2.4.a SG80 The assessment is appropriate for the stock and for the harvest control rule.	Eastern Pacific Skipjack	Issue: noting that there is no Harvest Control Rule, if there were a Harvest Control Rule, the score assigned to PI 1.2.4.a would not be sufficiently justified given difficulties in assessing the Eastern Pacific Skipjack. As previously stated, according to IATTC scientists, Skipjack tuna is a difficult species to assess. Due to their high and variable productivity it is difficult to detect the effect of fishing on the population with standard fisheries data and stock assessment methods. While a number of stock indicators are available, IATTC has not defined reference points for Skipjack in the Eastern Pacific Ocean, making it difficult to determine status with confidence.
Response (Paul Medley and Joe Powers): Eastern Pacific Skipjack SI1.2.4b has been reduced from SG80 to SG60 As indicated previously, the lack of any attempt to separate PI scores is not MSC methodology and is unhelpful. Specific to EPO skipjack, this is a technical opinion that a stock assessment/HCR could not be achieved. Skipjack is not a “difficult species”, the problem is a lack of appropriate data for the type of stock assessment usually used in these fisheries. However, there are many ways round this and IATTC is using a simple multivariate procedure. However, although there are reference points, they are generic, which does not meet SI1.2.4b SG80, and scoring now reflects this.		

Comments on Principle 3:

PI 3.1.3 Longterm objectives: The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.

Overarching comments
The MSC standard guidance relating to PI 3.1.3.a, includes:

"GSA4.5 Long term objectives PI (PI 3.1.3)

The CAB could use the following to evaluate how the UoA is considered to perform against this scoring issue:
A review of the factors that have influenced recent decisions in the UoA;
Knowledge of the extent to which such factors are consistent with achieving sustainability and
The application of the precautionary approach."

There are clear examples in each of where the responsible RFMO demonstrate inconsistency "with requirements in scoring issue (a) by the practices operating within the UoAs covered by the management system", such as Albacore under the management of, Indian Ocean Tuna Commission, and Bigeye tuna under the management of Inter-American tropical Tuna Commission Western and Central Pacific Fisheries Commission

Using Indian Ocean Albacore as an example, the assessors provide a list of measures throughout this scoring rationale, which reportedly show intent to use Harvest Control Rules (e.g. resolutions 12/11, 14/02, 13/10). Aside from the issues in using these resolutions as justification as outlined under PI 1.2.2. above, when the Indian Ocean Albacore species was deemed subject to overfishing, no management actions were taken. Albacore was 'subject to overfishing' for three 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.

Unlike Indian Ocean Albacore, Pacific Bigeye is still in a very precarious state, however there are similar historic patterns regarding the management of Bigeye in the Pacific to the management of Indian Ocean Albacore. Management of Pacific Bigeye as a species has been plagued with inaction, or partial ineffective action, leading to continued demise of the species. It was only at the end of 2014 that more resolute decisions were taken by the Inter-American tropical Tuna and Western and Central Pacific Fisheries Commission, although these required actions were not as precautionary as recommended by the science.

We remind that the precautionary approach, as defined by the UN Fish Stocks Agreement (1995) and adopted by the RFMOs, includes the requirement 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". These conditions have not been met and therefore the precautionary approach is not required to by management policy.

Indian Ocean Tuna Commission

3.1.3.a SG100 **Clear** long term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, **are explicit** within and **required** by management policy	Issue: in addition to the Indian Ocean Albacore example given under 'Overarching comments', the score assigned to PI 1.2.2(c) was too high as the justification relied on incomplete/misleading evidence. The authors' justification in part relies on Resolution 12/01 (On the implementation of the precautionary approach). Specific reference is made to: "In applying the precautionary approach, the Commission shall adopt, after due consideration of the advice supplied by the IOTC Scientific Committee, stock-specific reference points … and associated harvest control rules …". While there is a requirement to adopt stock-specific reference points and associated harvest control rules, this has not occurred. The Commission is waiting on advice from the Scientific Committee on both reference points and associated Harvest Control Rules. Currently there is still only a commitment to develop reference points and Harvest Control Rules. There is not even a timeline for implementation of the precautionary approach, although there is mention that "The IOTC Scientific Committee will report on the progress of the management strategy evaluation process at the Commission Session in 2014, with a view to confirming or updating any interim reference points and associated harvest control rules". There was a progress report on the Management Strategy Evaluation process in 2014 (IOTC–2014–S18–R[E]), however the process was not progressed enough for the reference points to be amended or formalised. Therefore it cannot be stated that the precautionary approach has been implemented by the IOTC.

Response (Paul Medley and Joe Powers): WCPFC and IOTC 3.1.3c score reduced from SG100 to SG80.

Although RFMOs appear to be required to apply the precautionary approach (PA) through their own resolution, it does appear in practice that, at least what we understand as the PA, is optional. This comment applies to WCPFC and IOTC. Both these have been down-graded to SG80 which does not "require" the PA.
We are uncertain what point is being made about MSEs. MSEs are not required to implement PA. In this context, we suppose MSE is a

prevarication, although this seems a little harsh.

PI 3.2.2 Decision-making processes: 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.

3.2.2.b Responsiveness of decision-making processes

General comments

The justifications for each RFMO respond weakly to the requirements of PI 3.2.2.b. They certainly do not address every aspect of PI 3.2.2.b, for example monitoring and evaluation. The situation is worst for the International Commission for the Conservation of Atlantic Tunas and the Indian Ocean Tuna Commission justifications as described below.

International Commission for the Conservation of Atlantic Tunas and the Indian Ocean Tuna Commission

3.2.2.b SG80 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.	Issue: the justification does not appear to relate to what is sought by the requirements for PI 3.2.2.b. The justification for International Commission for the Conservation of Atlantic Tunas and the Indian Ocean Tuna Commission almost entirely around the objection and dispute procedures, yet the MSC Standards and Guidance (v2.0) does not mention that these two facets of managements are what is required to meet PI 3.2.2.b. Even if objection and dispute procedures are relevant aspects of management to meet PI 3.2.2.b, looking at the Indian Ocean Tuna Commission justification, it does not also contain a single mention of the words (or equivalents): “research, monitoring, evaluation, consultation, wider implications”. The only aspect of PI 3.2.2.b that is covered is transparency, however this is only in respect of dispute resolution. In the conclusion the authors state “It can be shown that it deals with serious and important issues in a transparent, timely and adaptive manner …”, however the terms “timely and adaptive manner” are only referred to in the conclusion, without having been raised at all earlier. MSC Guidance explains that wider implication “means the processes take account of, for example, the consequences of decisions on management objectives for target species on the ecosystem, and of the impacts on those who depend on the fishery for their livelihoods”. There is no justification text that touches on this issue.

Response (Paul Medley and Joe Powers): No score change. Some text has been added to the report to address these concerns. However, as noted previously, this is a pre-assessment, so is more focused on weaknesses rather than describing actual decision processes. The objections procedure is probably the weakest part of the process, as it seems it can cause delays where it is used inappropriately.	

3.2.2.c Use of the Precautionary Approach

Overarching comments
There are clear examples in each RFMO of where an RFMO is not using the precautionary approach, by failing to apply "caution when information is uncertain, unreliable or inadequate", such as Albacore under the management of Indian Ocean Tuna Commission, and Bigeye tuna under the management of Inter-American tropical Tuna Commission Western and Central Pacific Fisheries Commission

Using Indian Ocean Albacore as an example, when the Indian Ocean Albacore stock was deemed subject to overfishing, no management actions were taken. Albacore was 'subject to overfishing' for three 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. The authors state that "Decision-making processes clearly attempt to use the best available information", however attempting to do something does not, as in the Indian Ocean Albacore example, mean that decision-making processes actually "are based on best available information".

There are many other examples where the Indian Ocean Tuna Commission has clearly ignored the best available information, such as outlined under PI 1.2.2.c above regarding to the commission's ignoring requests to extend Resolution 12/11 (On the Implementation of a Limitation of Fishing Capacity of Contracting Parties and Cooperating Non-Contracting Parties).

Unlike Indian Ocean Albacore, Pacific Bigeye is still in a very precarious state, however there are similar historic patterns regarding the management of Bigeye in the Pacific to the management of Indian Ocean Albacore. Management of Pacific Bigeye as a species has been plagued with inaction, or partial ineffective action, leading to continued demise of the species. It was only at the end of 2014 that more resolute decisions were taken by the Inter-American

tropical Tuna and Western and Central Pacific Fisheries Commission, although these required actions were not as precautionary as recommended by the science.

We remind that the precautionary approach, as defined by the UN Fish Stocks Agreement (1995) and adopted by the RFMOs, includes the requirement 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". These conditions have not been met and therefore it most certainly cannot be stated that the approach is being used in practice. WWF requests that if the RFMOs are to pass 3.2.2.c, that the authors provide "verified evidence that the absence of adequate scientific information is not used as a reason for postponing or failing to take conservation and management measures", and "that decision-making processes use caution when information is uncertain, unreliable or inadequate".

Nonconformance with MSC requirements
There is not apparent evidence to demonstrate conformance with the following certification requirements:
SA4.8.1 The team shall verify that the absence of adequate scientific information is not used as a reason for postponing or failing to take conservation and management measures.
SA4.8.2 The team shall interpret that at SG80 and SG100 the precautionary approach in this PI to mean that decision-making processes use caution when information is uncertain, unreliable or inadequate.

3.2.2.c SG80 Decision-making processes use the precautionary approach and are based on best available information.	Issue: the Indian Ocean Tuna Commission does not meet the SG80 score assigned to PI 1.2.2(c) as the Commission does routinely use the precautionary approach. The Indian Ocean Albacore example given under 'Overarching comments' covers WWF's evidence for the concerns outlined for this PI. In addition, there is evidence of proposals being deferred, citing absence of scientific information. This demonstrates that in some cases the "absence of adequate scientific information is" "used as a reason for postponing or failing to take conservation and management measures", which contravenes requirement SA4.8.1. For example, at its 2012 meeting, "the Commission considered a proposal on the conservation of sharks, but agreement could not be reached and the proposal was deferred until the next meeting of the Commission." The proposal included a prohibition on "the use of wire trace on longline fishing vessels as a proven mitigation measure that will ameliorate the impact of fisheries for tuna and tuna-like species on shark populations throughout the IOTC area of competence. Japan, China and the Republic of Korea indicated that there was …insufficient scientific justification for the ban on wire trace was provided to the

	Commission from the SC." (IOTC–2012–S16–R[E]). This was already the second time that the proposal had been put to the Commission. Given Japan, China, and Korea's concerns, in 2013, the Commission was presented with "advice from the SC15 that on the basis of information presented to the SC in 2012 and in previous years, the SC recognised that the use of wire leaders/traces in longline fisheries may imply targeting of sharks. The SC therefore recommended to the Commission that, if it wishes to reduce catch rates of sharks by longliners, it should prohibit the use of wire leaders/traces". Prohibiting the use of wire traces on longline vessels was unsuccessfully proposed again to the Commission in 2013 and 2014. The authors should review the reasons for the deferral of proposals in the Commission reports.

Response (Paul Medley and Joe Powers): No score change.

We agree, the application of the precautionary approach is of concern. These RFMOs would claim, we think, that they do follow the precautionary approach as they are, in most cases, required to do so. The precautionary approach consists of two bits:
For SA4.8.1, we need an example where the absence of adequate scientific information has been used as a reason for postponing or failing to take conservation and management measures. The reasons given for delays are socio-economic and/or that risks are not high enough. If there is a case where a decision is deferred while research is conducted, then this does not meet the precautionary approach (PA). This part of PA only exists because scientific research had previously been used as a delaying tactic, which was clearly foolish. As far as we can see, this is not done anymore.
For SA4.8.2, we need to consider that caution applied is consistently below that needed for MSC. The problem here is you can apply different levels of caution, and frankly how much you should apply is down to personal judgement. We have reviewed the evidence here on shark bycatch. A reduction in shark mortality is more precautionary. Any reduction in any mortality is more precautionary. The only guidance available on the level of precaution required is indirect in the MSC methodology. Although we are concerned that precaution applied by RFMOs is not consistent with MSC, but this does not apply to most/all decision-making. For example, as noted in the overarching comment, PA requires that RFMOs "determine, on the basis of the best scientific information available, stock-specific reference points and the action to be taken if they are exceeded", and the comment also notes that RFMOs have adopted and are doing this. This does represent decision-making using the precautionary approach. The only requirement that could be imposed to meet this SG80 would be a resolution requiring the PA is used, but they already have that.
Therefore, where particular decisions do not appear to apply precaution appropriate to MSC requirements, these can and are raised under appropriate PIs and reasons given. This SI is too broad to be useful, and with a resolution claiming caution is already applied, difficult to argue either way. A more constructive approach is to argue more precaution in specific cases. All issues raised in the comments are addressed in P1

and P2 performance indicators.

PI 3.2.3 Assessment of stock status: There is an adequate assessment of the stock status.

Indian Ocean Tuna Commission

3.2.3.b SG60 Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Issue: PI 3.2.3.b cannot be scored for the Indian Ocean Tuna Commission (IOTC) as sanctions to deal with non-compliance do not exist in the Commission. The 2009 Performance Review notes “Low levels of compliance with IOTC measures and obligations are commonplace. The Commission to date has taken very limited actions to remedy this situation – there are currently no sanctions/penalties for non-compliance in place. Moreover, the list of illegal, unreported and unregulated (IUU) vessels applies to non-Members only.” Recommendation 54 came out of the Performance Review: “IOTC should establish a sanction mechanism for non-compliance, and task the Compliance Committee to develop a structured approach for cases of infringement.” In the more than five years since the first performance review, Recommendation 54 has still not been addressed, despite the Commission being reminded annually (e.g. IOTC–2014–S18–R[E]), and that through the IOTC Rules of Procedure, the Compliance Committee is tasked to “Develop a scheme of incentives and sanctions and a mechanism for their application to encourage compliance by all CPCs.” The Commission agreed that “Attempts over the last two years to introduce a scheme of penalties to be applied in case in case of non-fulfilment of reporting obligations have so far not received the required support for adoption. There is a need to continue these efforts.” Recommendation 54 was ranked as a high priority, however progress has not yet been made. Moreover, systematic non-compliance is deemed to take place concerning data reporting duties and implementation of the IOTC regional observer scheme. Many countries do not fulfill their reporting duties, e.g. with regard to landings of target tunas. “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. More than half of the 2012 data are not reported by the respective countries, but estimated by the IOTC Secretariat. When it comes to artisanal fisheries, the ratio estimated:reported is even larger and accounts to 3:1. The level of implementation of the IOTC regional observer scheme and reporting of the observer is deemed insufficient by the IOTC Secretariat.

	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, from the 2014 Compliance Committee, 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.
Response (Paul Medley and Joe Powers): No score change. As stated, sanctions exist which are implemented by CPCs and there is some evidence that they are applied, but this varies country by country. As this is patchy, SG60, but not SG80 is met. Sanctions do not appear to have been developed at the RFMO level. However, it is worth noting, sanctions here refer to those on vessels, not on CPCs.	
3.2.3.c SG80 **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.	Issue: evidence demonstrates that PI 3.2.3c cannot be met to the SG80 level. Evidence clearly demonstrates that fishers do not generally comply with the management system under assessment, particularly regarding the provision of information to the Indian Ocean Tuna Commission. As described under 3.2.3.b above, non-compliance is a significant issue in the Indian Ocean Tuna Commission. 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. Measures can only be effective if implemented. The Indian Ocean Tuna Commission Secretariat is running compliance missions over a number of years to help address this situation, and while some small improvements have been made, the problem is currently far from resolved.

	Nonconformance with MSC requirements There is no apparent evidence to demonstrate full conformance with the following certification requirements: SA4.9.1 In scoring issue (c) the team should consider whether “fishers cooperate, where necessary, with management authorities in the collection of catch, discard and other information that is of importance to the effective management of the resources and the fishery” as one of the elements that should influence scoring.

Response (Paul Medley and Joe Powers): No score change.

This, with other PIs in 3.2, would be more convincingly scored for a particular fishery. Clearly, and as stated, where a fishery does not meet reporting requirements, it would not meet SG80 or possibly SG60. However, it is also worth noting that due account should be taken of the context and size of the fishery concerned. This type of reporting requirement generally favours industrial fleets, but preventing traditional fisheries operating also does not meet the MSC standard. The important scoring issue text here is “when required, providing information of importance to the effective management of the fishery.” How important is accurate data on Madagascar handlining to the management of these stocks? Overall, some evidence exists that compliance across the IOTC fisheries is adequate, but in practice some flag states would pass, others probably fail. Handling in Madagascar would probably fail, whereas large industrial purse seiners would pass. The SG80 captures the patchy performance across the fisheries.
As stated, compliance missions are being run, but the issue has not been resolved. However, it is likely it will never be resolved. Reporting requirements will increase as capabilities increase, so there will always be a gap between what is desired and what is available.