

MSC Fisheries Standard and Guidance v2.0
(Extracted from Annexes SA, SB, SC and SD of the
Fisheries Certification Requirements v2.0)



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The MSC prohibits any modification of part or all of the contents in any form

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Erratum to FCR v2.0

Released 1st April, 2015

On September 1st, 2014 the MSC released the MSC Fisheries Certification Requirements (FCR) v2.0. Minor revisions to this document that consist mainly of editorial changes have been incorporated to FCR v2.0 and are outlined below:

Section	Description of amendment
All	Capitalised Fisheries Standard
All	Corrected hyperlinks
All	Replaced 'critical guidance' with 'regular guidance' icon and vice versa
Table SA10, scoring issue (SI) ()	Added at SG100 "Minor primary species are highly likely to be above the PRI"
Table SA12, scoring issue (SI) (a)	Added "primary"
Table SA12, SI (b)	Added "primary"
Table SA13	Replaced "biological based limit" with "biologically based limit"
Table SA13, SI (b)	Added "Minor secondary species are highly likely to be above biologically based limits"
Table SA19	Added "in the area(s) where the UoA operates."
Table SA19, SI (b)	Added brackets
SA4.3.4.1.b	Deleted "A coherent, logical set of practices or procedures".
Table SA20, SI (d)	Added brackets
SC4.4.2	Added "No modifications to Table SA26."
Table SC15	Added "in the area(s) where the UoA operates."
Table SC15, SI (b)	Added brackets
Table SC16, SI (d)	Added brackets
SC6.1.2	Amended cross reference. Replaced "SC6.1.2 and SC6.1.3" with "SC6.1.1.1 and SC6.1.1.2"
SC6.1.3	Amended cross reference. Replaced "SC6.1.3.a" with "SC6.1.1.1.a and SC6.1.1.2.a"
GSC2.9	Deleted repeated text "In these systems, the entire natural reproduction life cycle occurs in a natural habitat, with the main artificial production interventions being enhanced spawning gravel habitat and controlled channel flows. Once fish enter the spawning channel, all reproduction processes (e.g., mate selection, redd building, incubation and any rearing) occur without human intervention."
Figure GSA1:	Revised figure
GSC2.1.1	Added footnote with reference

Responsibility for these Requirements

The Marine Stewardship Council is responsible for these Requirements.

Readers should verify that they are using the latest copy of this (and other documents). Updated documents, together with a master list of all available MSC documents, can be found on the MSC's website.

Versions issued

Version No.	Date	Description Of Amendment
Consultation Draft	17 January 2011	First publication of consolidated MSC scheme requirements, released for consultation.
0.0	7 March 2011	First draft of revisions following MSC and CAB consultations.
0.8	19 May 2011	Draft issued to the MSC Technical Advisory Board for final review and sign-off.
1.0	15 August 2011	First version issued for application by Conformity Assessment Bodies.
1.1	24 October 2011	Version issued incorporating revised Group CoC requirements and correcting typos, page numbering, wrong and missing referencing and unreadable flowcharts.
1.2	10 January 2012	Version issued incorporating TAB 20 agreed changes regarding reassessment, objections procedure, modifications to the default assessment tree to assess bivalves, implementation timeframes and ASC requirements. Minor edits, wrong and missing referencing, typos and unreadable Figures were corrected.
1.3	14 January 2013	Version issued incorporating TAB 21 and BoT agreed changes. Minor edits and clarifications were also incorporated.
2.0	1 October 2014	Version issued incorporating changes to the standard as a result of the Fisheries Standard review and changes to CABs procedures as a result of the speed and cost review.

Marine Stewardship Council

Vision

Our vision is of the world's oceans teeming with life, and seafood supplies safeguarded for this and future generations.

Mission

Our mission is to use our ecolabel and fishery certification program to contribute to the health of the world's oceans by recognising and rewarding sustainable fishing practices, influencing the choices people make when buying seafood, and working with our partners to transform the seafood market to a sustainable basis.

Focus

We will:

- Collaborate with fishers, retailers, processors, consumers and others to drive change forward;
- Never compromise on the environmental standard we set, nor on our independence;
- Continue to lead the world in wild-capture fishery certification, with the most trusted, recognised and credible seafood ecolabel.

General Introduction

Fisheries certification

With international consultation with stakeholders, the MSC has developed standards for sustainable fishing and seafood traceability. They ensure that MSC-labelled seafood comes from, and can be traced back to, a sustainable fishery.

MSC standards and requirements meet global best practice guidelines for certification and ecolabelling programmes.

The MSC Fisheries Standard sets out requirements that a fishery must meet to enable it to claim that its fish come from a well-managed and sustainable source.

Throughout the world fisheries are using good management practices to safeguard jobs, secure fish stocks for the future and help protect the marine environment. The science-based MSC environmental standard for sustainable fishing offers fisheries a way to confirm sustainability, using a credible, independent third-party assessment process. It means sustainable fisheries can be recognised and rewarded in the marketplace, and gives an assurance to consumers that their seafood comes from a well-managed and sustainable source.

The MSC standard applies to wild-capture fisheries that meet the scope requirements provided in section 7.4.

The MSC Fisheries Standard comprises three core principles:

Principle 1: Sustainable target 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.

Principle 2: Environmental impact of fishing

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: 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.

Implementation timeframes

Effective date

Release date: 1st October 2014

Effective date: 1st April 2015

The implementation timelines are different for the process requirements and the standard requirements. Although these requirements are found in the same document, the MSC Fisheries Standards are located in the S-Annexes, while the process requirements are found in the main document of the FCR and the P-Annexes.

First full assessments that commence after the effective date shall be conducted in accordance with the new standard requirements in FCR v2.0 in addition to using the new processes, including the RBF (Annex PF).

All other assessment processes (including first assessments, surveillance audits, certificate extensions and reassessments) in existing fisheries (in assessment or certified before the effective date) that commence¹ after 1st April 2015 shall be conducted in accordance with the new process requirements in FCR v2.0, with the exception of the RBF requirements (Annex PF). Existing fisheries still using the standard requirements v1.3 shall apply the RBF requirements as published in CR v1.3 (Annex CC), unless variation is requested and granted to allow use of the RBF process in FCR 2.0 (Annex PF). Such request shall confirm how the differences between CR versions are to be allowed for and which sections of Annex PF shall be applied. 

Existing fisheries (in assessment or certified) shall apply the new standard requirements in addition to the RBF (Annex PF) at their first reassessment commencing after 1st October 2017.

Any fishery may elect to use the new process and standard requirements as of the publication date (1st October 2014) if they wish and CABs can confirm their readiness to apply.

Fisheries which entered full assessment prior to 10 March 2012 and which have not published their PCDR by 1 December 2014 shall apply FCR 7.3.

CABs shall use the same version of the FCR process for each full assessment (i.e., from the start of announcement of the fishery through to certification), and for each individual surveillance, except in cases where the assessments are delayed, as covered by FCR sections 7.3.3-4, and allowing for the special case of the RBF process, as outlined above.

Review

Sections of the FCR 1 to Annex PF cover the processes by which fisheries are assessed by CABs. Changes may be made to these documents annually.

Annex SA–SD are the MSC Fisheries Standard. Changes to these annexes will only be made as part of a standard review conducted in accordance with the ISEAL Standard Setting Code. The next review of the standard will be in 2019.

¹ Commencing: announcing a full assessment, reassessment, or surveillance audit of a fishery, entering a contract for a CoC audit

MSC welcomes comments on the Fisheries Standards at any time. Comments will be incorporated into the next review process. Please submit comments by mail or email to contact details provided at the beginning of the document.

More information about the MSC policy development process and MSC Standard Setting Procedure can be found on the [MSC Policy website](#) and [MSC website](#).

Introduction to this document

The set of sections comprising the MSC Fisheries Certification Requirements consists of:

1. The MSC Fisheries Standard, which is composed of three core principles and has three associated modifications for use in different types of fishery (Annexes SA, SB, SC and SD).
2. Guidance to the MSC Fisheries Standard (Annexes GSA, GSB, GSC and GSD).
3. Sections 1-8 and process annexes (PA-PF).
4. Guidance to sections 1-8 and guidance to the process annexes (GPA-GPX).

Fisheries Certification Requirements

The purposes of the MSC Fisheries Certification Requirements are:

1. To establish consistent certification requirements to enable all conformity assessment bodies (CABs) to operate in a consistent and controlled manner;
2. To provide the transparency that is required of an international certification scheme for it to have credibility with potential stakeholders, including governments, international governmental bodies (e.g., regulatory bodies, fishery managers), CABs, suppliers of fish and fish products, non-governmental organisations and consumers;
3. To provide documentation designed to assure long-term continuity and consistency of the delivery of MSC certification.

Guidance

The Guidance to the MSC Fisheries Certification Requirements (GFCR) has been produced to help CABs interpret the MSC Fisheries Certification Requirements.

Guidance has been developed to:

- Provide clarification on questions asked by CABs;
- Address areas of concern to the MSC;
- Act as a training aid for both MSC and CAB staff;
- Detail processes that should be followed in special cases.

Guidance to the MSC Fisheries Standards has also been developed to:

- Confirm MSC's intent on specific aspects of the assessment requirements in Annex SA, to enable CABs to operate in a consistent and controlled manner;
- Provide the transparency that is required of an international standard setting body for it to be credible with stakeholders, including governments, fishery managers, CABs, suppliers of fish and fish products, non-governmental organisations and consumers;

- Specify a system that ensures the MSC ecolabel on fish or fish products is a credible assurance that the fish is derived from a well-managed and sustainable fishery, as defined by the MSC's Principles and Criteria.

The headings and numbering in the guidance, when included, match those in the FCR exactly, with numbers prefaced with the letter "G" to indicate Guidance.

The MSC recommends that CABs read the MSC Fisheries Certification Requirements in conjunction with the MSC Guidance to the Fisheries Certification Requirements (GFCR). Text from the MSC Fisheries Certification Requirements is not repeated in the guidance document.

Where guidance is provided that generally relates to the subject of a major heading, or relates to the content of a specific clause, this icon  appears at the end of the title or clause, and if critical guidance is included, this icon  appears. These icons provide hyperlinks to the related guidance section.

Auditability

This guidance is not directly auditable. It is, however, expected that the critical guidance identified in this document will be followed by CABs where applicable unless there is a justification for not doing so. It is likely that this critical guidance would be referenced by the accreditation body in any non-conformity to related FCR clauses.

The presence of critical guidance is identified with this icon  and includes:

- **Special cases:** These relate to requirements that apply to a particular type of fishery, data or situation. For example, when assessing an LTL stock the species' role in the ecosystem should be considered in reference points.
- **Additional clarification** on how a clause in the FCR would usually be expected to be implemented. The use of different methods would need to be justified.

Critical guidance is identified within the guidance itself with a sidebar, as illustrated in this paragraph.

Within the guidance, this icon  provides a hyperlink back to the corresponding section or clause in the requirements.

Derogations

Derogations are indicated by a footnote including:

- a. The authority who made the decision on the derogation;
- b. The date or meeting number of the decision;
- c. The date on which the derogation came into force or expires; and
- d. A short description of the derogation.

A derogation indicates a measure which allows for all or part of the requirement to be applied differently, or not at all, to certain applicants or certificate holders.

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Annex SA: The Default Assessment Tree – Normative

The default tree structure, includes the PISGs for each of the three MSC Principles to be used in fishery assessments [□](#)

Scope [□](#)

To be eligible for certification against the MSC Fisheries Standard a fishery must meet the scope criteria. The normative requirements for scope criteria are presented in FCR 7.4.

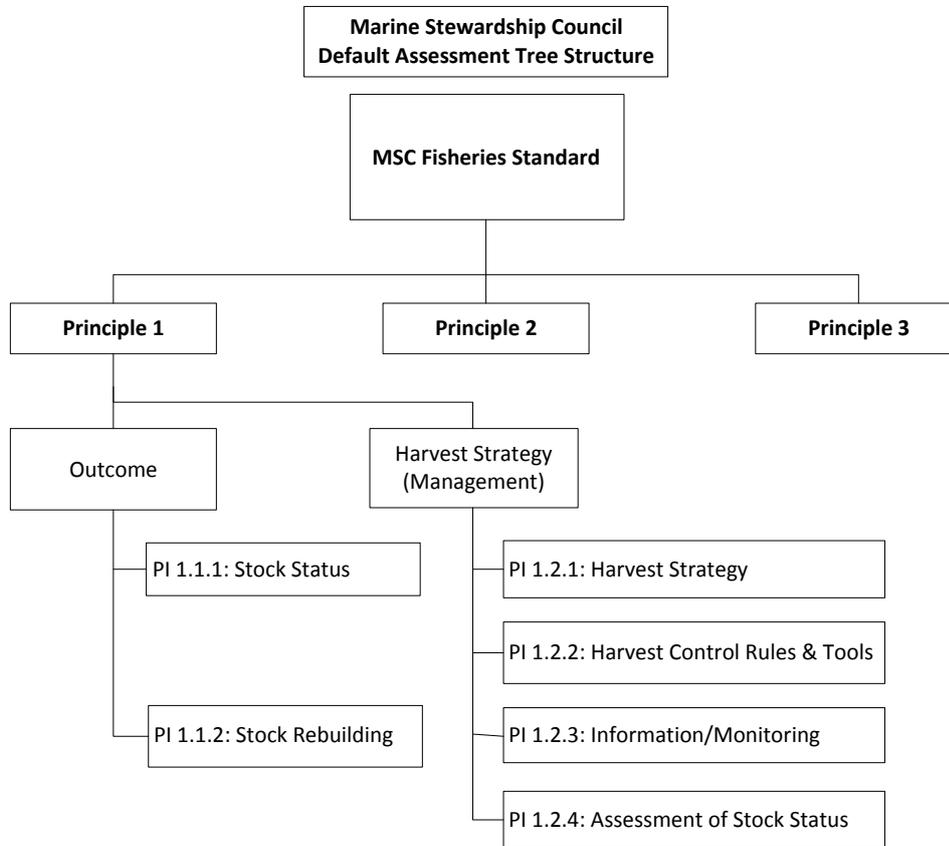
SA1 General

SA1.1 General requirements [□](#)

- SA1.1.1 CABs shall focus all assessments of fisheries against the MSC Fisheries Standard on:
- a. The outcomes of fisheries management process.
 - b. The management strategies implemented that aim to achieve those outcomes.
- SA1.1.2 CABs shall apply requirements set out in Annex PF when using the RBF.
- SA1.1.3 CABs shall follow subsequent standard annexes for species that require the use of a modified default tree.

SA2 Principle 1

Figure SA1: Principle 1 Default Tree Structure



SA2.1 General requirements for Principle 1 !!

SA2.1.1 In Principle 1, teams shall score the whole of the target stock(s) selected for inclusion in the Unit of Assessment (UoA).

SA2.2 Stock status PI (PI 1.1.1) 

Table SA1: PI 1.1.1 Stock status PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Outcome	Stock status 1.1.1 The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.	(a) Stock status relative to recruitment impairment.	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
		(b) Stock status in relation to achievement of Maximum Sustainable Yield (MSY). 		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.

Scoring stock status 

SA2.2.1 In P1 the terms “likely”, “highly likely” and “high degree of certainty” are used to allow for either qualitative or quantitative evaluation. In a probabilistic context and in relation to scoring issue (a):

SA2.2.1.1 Likely means greater than or equal to the 70th percentile of a distribution (i.e., there shall be at least a 70% probability that the true status of the stock is higher than the point at which there is an appreciable risk of recruitment being impaired).

SA2.2.1.2 Highly likely means greater than or equal to the 80th percentile.

SA2.2.1.3 High degree of certainty means greater than or equal to the 95th percentile.

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 time periods over which to judge fluctuations. 

SA2.2.3 Where information is not available on the stock status relative to the Point of Recruitment Impairment (PRI) or MSY levels, proxy indicators and reference points may be used to score PI 1.1.1. 

SA2.2.3.1 Where proxy indicators and reference points are used to score PI 1.1.1, the team shall justify their use as reasonable proxies of stock biomass for the PRI and/or MSY. 

SA2.2.4 The recent trends in fishing mortality rate may be used as a means of scoring stock status. 

- SA2.2.4.1 In this case, teams shall demonstrate that F has been low enough for long enough to ensure that the required biomass levels are now likely to be met.

Stock complexes

- SA2.2.5 Where several species or stocks are fished as stock complexes, they may be treated as separate UoAs, or as separate scoring elements within a single UoA (as in the case of multiple primary species considered under PI 2.1.1). In either case, for each SG the team shall seek evidence that, as an outcome, the levels of 'likelihood' meet the levels of 'likelihood' specified in SA2.2.1 for each separate stock. 
- SA2.2.6 Where species or stocks are fished as stock complexes, the overall target reference points should be consistent with the intent of the PI, and maintain the high productivity of the stock complex.

Consideration of Environmental Variability

- SA2.2.7 As ecosystem productivity may change from time to time as marine environments change naturally, for instance under conditions of regime shift, the team shall verify that reference points are consistent with ecosystem productivity.
- 

- SA2.2.7.1 If changes in fishery productivity are due to natural environmental fluctuations, teams shall accept adjustments to the reference points consistent with such natural environmental fluctuations.
- SA2.2.7.2 If fishery productivity is being affected through human-induced impacts (either directly from the UoA or from other sources such as pollution or habitat degradation), no changes to reference points are justified.
- a. The impacts should be resolved.
 - b. The UoA should receive a reduced score in PI 1.1.1 until the stock is above the unadjusted reference points.

Treatment of key Low Trophic Level (LTL) stocks

- SA2.2.8 The team shall consider the trophic position of target stocks to ensure precaution in relation to their ecological role, in particular for species low in the food chain. 
- SA2.2.9 Teams shall treat a stock under assessment against Principle 1 as a key LTL stock if: 
- a. It is one of the species types listed in Box SA1 and in its adult life cycle phase the stock holds a key role in the ecosystem, such that it meets at least two of the following sub-criteria i, ii and iii.
 - i. A large proportion of the trophic connections in the ecosystem involve this stock, leading to significant predator dependency;
 - ii. A large volume of energy passing between lower and higher trophic levels passes through this stock;
 - iii. There are few other species at this trophic level through which energy can be transmitted from lower to higher trophic levels, such that a high proportion of the total energy passing between lower and higher trophic levels passes through this stock (i.e., the ecosystem is 'wasp-waisted').

- b. It is not one of the species types listed in [Box SA1](#), but in its adult life cycle phase it meets at least two of the sub criteria in SA2.2.9a.i–iii, and additionally meets the following criteria:
 - i. The species feeds predominantly on plankton; has a trophic level of about 3 (but potentially ranging from 2 to 4); is characterised by small body size, early maturity, high fecundity and short life span (default values: <30cm long as adults, mean age at maturity ≤ 2, >10,000 eggs/spawning, maximum age <10 years respectively); and forms dense schools.
- c. Teams shall provide evidence specifically addressing each of the sub-criteria in SA2.2.9 to justify any decision to not define the stock as a key LTL species in the ecosystem under assessment.
 - i. In the case where there is no information on a sub-criterion in SA2.2.9, the stock shall be assumed to meet that sub-criterion.
 - ii. In providing rationales against the key LTL sub-criteria (SA2.2.9.a.i–iii), teams shall document the choice of spatial scale and provide reasonable justification for the choice.

SA2.2.10 Teams shall determine whether a species is to be considered a key LTL species based on its status at the time of assessment. The determination shall be reviewed at each surveillance audit.

Box SA1: Species types that are defined by default as “key LTL stocks” for the purposes of an MSC assessment. See ASFIS List of Species for species included in different families and orders (<http://www.fao.org/fishery/collection/asfis/en>)

Box SA1: Species types that are defined by default as “key LTL stocks” for the purposes of an MSC assessment. ▣

See ASFIS List of Species for species included in different families and orders (<http://www.fao.org/fishery/collection/asfis/en>)

- Family Ammodytidae (sandeels, sandlances)
- Family Clupeidae (herrings, menhaden, pilchards, sardines, sardinellas, sprats)
- Family Engraulidae (anchovies)
- Family Euphausiidae (krill)
- Family Myctophidae (lanternfish)
- Family Osmeridae (smelts, capelin)
- Genus Scomber (mackerels)
- Order Atheriniformes (silversides, sand smelts)
- Species *Trisopterus esmarkii* (Norway pout)

Scoring of key LTL stocks

Table SA2: PI 1.1.1 Stock status PISGs applicable to key LTL stocks

Component	PI	Scoring issues	SG60	SG80	SG100
Outcome	Stock status 1.1.1A The stock is at a level which has a low probability of serious ecosystem impacts.	(a) Stock status relative to ecosystem impairment.	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
		(b) Stock status in relation to ecosystem needs.		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.

SA2.2.11 Stocks identified as key LTL stocks shall be scored using [Table SA2](#) and as detailed in [SA2.2.12](#) to [SA2.2.16](#) below.

SA2.2.12 When scoring PI 1.1.1A scoring issue (a), the point where serious ecosystem impacts could occur shall be interpreted as being substantially higher than the point at which recruitment is impaired (PRI), as determined for the target species in a single species context. 

- a. Such point may be analytically determined from ecosystem models, but in any case shall not be less than 20% of the spawning stock level that would be expected in the absence of fishing.

SA2.2.13 When scoring PI 1.1.1A scoring issue (b), the expectations for key LTL species shall be as given below: 

- a. The default biomass target level consistent with ecosystem needs shall be 75% of the spawning stock level that would be expected in the absence of fishing.
- b. A higher or lower target level, down to a minimum allowed 40% of the spawning stock level that would be expected in the absence of fishing, may still achieve an 80 level score if it can be demonstrated, through the use of credible ecosystem models or robust empirical data for the UoA/ecosystem being assessed, that the level adopted: 
 - i. Does not impact the abundance levels of more than 15% of the other species and trophic groups by more than 40% (compared to their state in the absence of fishing on the target LTL species); and

- ii. Does not reduce the abundance level of any other species or trophic group by more than 70%.
- SA2.2.14 At SG100 in scoring issue (b) a higher degree of certainty is required when considering the ecological impact of the UoA on the stock.
- a. For key LTL species to score 100 the expectations for ecosystem needs reference levels may remain as specified at SG80, but teams shall demonstrate that biomass levels are fluctuating “above” the required level.
- SA2.2.15 Where proxy indicators and reference points are used to score key LTL species at PI 1.1.1A, the team shall justify their use as reasonable proxies of stock biomass for the points where serious ecosystem impacts could occur and the level consistent with ecosystem needs. !!
- a. Where fishing mortality rate is used to score stock status, the default fishing mortality required to maintain a stock fluctuating around the level consistent with ecosystem needs shall take the value of $0.5M$ or $0.5 F_{MSY}$, where F_{MSY} has been determined in a single species context.
 - b. Proxy fishing mortalities required to maintain the stock above the point where serious ecosystem impacts could occur shall be lower than assumed to be able to keep the population above the point where recruitment would be impaired.
 - c. Departures from these default levels may be justified if it can be demonstrated that SA2.2.13.b is met.
- SA2.2.16 Performance against these reference points shall be judged (in PI 1.1.1A) in the context of recruitment variability typical for the given species in its ecosystem. ■

Consideration of uncertain information

- SA2.2.17 The consideration of the status of the stock in P1 shall include mortality that is observed and mortality that is unobserved.

SA2.3 Stock rebuilding PI (PI 1.1.2) !!

Table SA3: PI 1.1.2 Stock rebuilding PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Outcome	Stock Rebuilding 1.1.2 Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe.	(a) Rebuilding timeframes	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.
		(b) Rebuilding evaluation	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 .

- SA2.3.1 Teams shall only score this PI when Stock Status PI 1.1.1 does not achieve an 80 score.
- SA2.3.2 In cases where stocks score 80 or above on PI 1.1.1 at the time of assessment, but scores are then reduced during a certification cycle, the team shall ensure that rebuilding strategies and monitoring are put in place within one year of becoming aware of the reduced status, (or as early as practicable in stocks that are not assessed on an annual basis). !!
- SA2.3.3 The team shall require that where a score of between 60 and 80 is awarded, the subsequent conditions are fulfilled within one certification period. !!
- SA2.3.4 In scoring issue (b), where fishing mortality rate is available for the UoA: !!

- SA2.3.4.1 Current F shall be “likely” to be less than F_{MSY} to justify an 80 score; and
 - SA2.3.4.2 Current F shall be “highly likely” to be less than F_{MSY} to justify a 100 score.
 - SA2.3.4.3 A UoA need not meet the above requirements if there is alternative clear evidence that the stocks are rebuilding.
- SA2.3.5 In UoAs that use assessments and reference points that are regarded as proxies of F_{MSY} and/or B_{MSY} , teams shall take account in their scoring of any differences between the proxy reference levels and MSY levels and shall provide justification that the assigned Scoring Guidepost (SG) level is met.

SA2.4 Harvest strategy PI (PI 1.2.1) !!

Table SA4: PI 1.2.1 Harvest strategy PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Harvest strategy (management)	Harvest strategy 1.2.1 There is a robust and precautionary harvest strategy in place.	(a) Harvest strategy design !!	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.
		(b) Harvest strategy evaluation	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.
		(c) Harvest strategy monitoring	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
		(d) Harvest strategy review			The harvest strategy is periodically reviewed and improved as necessary.
		(e) Shark finning	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.

		(f) Review of alternative measures	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
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SA2.4.1 Teams shall interpret:

SA2.4.1.1 “Evaluated” at SG100 to mean ‘tested for robustness to uncertainty, appropriate to the scale and intensity of the UoA’.

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.

SA2.4.2 If conditions are set, changes to the Harvest Control Rules or assessment method may be needed to make these conditions operational. If new HCRs or assessment methods require different or additional information, the team shall ensure that it shall be either already available or shall be made part of the condition.

Shark finning

SA2.4.3 If the target species is a shark, the team shall score scoring issue (e) to ensure that shark finning is not being undertaken in the fishery.

SA2.4.4 In scoring issue (SI) (e) the terms “likely”, “highly likely” and “high degree of certainty” are used to allow for either qualitative or quantitative evaluation.

SA2.4.4.1 The team shall consider how the level of external validation and regulations in place work together to deliver the required confidence that shark finning is not taking place.

SA2.4.5 When scoring SI (e) at SG60, the expectation shall be that one of the following subparagraphs applies:

SA2.4.5.1 If fins are cut on board:

- a. There are regulations in place governing the management of sharks;
- b. Shark fins and carcasses shall be landed together in compliance with a ratio specifically relevant for the species, fishing fleet and initial post-catch processing (e.g., fresh/frozen/dried); and
 - i. The team shall document the justification for using the specific ratio.
- c. Good external validation of the vessels’ activities is available to confirm that it is likely that shark finning is not taking place. **!!**

SA2.4.5.2 If sharks are processed on board:

- a. There are regulations in place governing the management of sharks;
- b. There is full documentation of the destination of all shark bodies and body parts; and
- c. Some external validation of the vessel's activities is available to confirm that it is likely that shark finning is not taking place.

SA2.4.6 When scoring SI (e) at SG80, the expectation shall be that one of the following subparagraphs applies:

SA2.4.6.1 All sharks are landed with fins naturally attached;

SA2.4.6.2 If sharks are processed on board:

- a. There are regulations in place governing the management of sharks;
- b. There is full documentation of the destination of all shark bodies and body parts; and
- c. Good external validation of the vessels' activities is available to confirm that it is highly likely that shark finning is not taking place.

SA2.4.7 When scoring SI (e).at SG100, the expectation shall be that one of the following subparagraphs applies:

SA2.4.7.1 If sharks are landed with fins naturally attached, there is some external validation such that there is a high degree of certainty that shark finning is not taking place.

SA2.4.7.2 If sharks are processed on board

- a. There are comprehensive regulations in place governing the management of sharks;
- b. There is full documentation of the destination of all shark bodies and body parts; and
- c. Comprehensive external validation of the vessels' activities is available to confirm with a high degree of certainty that shark finning is not taking place.

Unwanted catch

SA2.4.8 Scoring issue (f) requires that UoAs review whether the use of alternative measures could reduce the mortality arising from unwanted catches from the target stocks.

SA2.4.8.1 Teams shall apply scoring issue (f) to target stocks in P1 in the same way as applied to species in P2, noting sections [SA3.5.3](#) and [related guidance](#).

SA2.5 Harvest control rules and tools PI (PI 1.2.2) !!

Table SA5: PI 1.2.2 Harvest control rules and tools PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Harvest strategy	Harvest control rules and tools 1.2.2 There are well defined and effective harvest control rules (HCRs) in place.	(a) HCRs design and application	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.
		(b) HCRs robustness to uncertainty 		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.
		(c) HCRs evaluation 	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.

SA2.5.1 Teams should require additional precaution to be built into the HCR at SG100 so the HCR keeps stocks well above limit reference points.

Scoring 'available' HCRs at SG60 !!

- 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; or
 - In UoAs where B_{MSY} estimates are not available, the stock has been maintained to date by the measures in use at levels that have not declined significantly over time, nor shown any evidence of recruitment impairment.
- 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} .
- SA2.5.4 In scoring issue (a) at the SG100 level, where quantitative simulation testing is available, "most of the time" should be interpreted as the stock being maintained at or above MSY or some ecologically more relevant target point at least 70% of the time. ☐
- 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.

Evaluating the effectiveness of HCRs ☐

- 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. ☐
- SA2.5.7 Where information is not available on the exploitation rate consistent with achieving a long term MSY, proxy indicators and reference points may be used to evaluate the effectiveness of HCRs in scoring issue (c). ☐
- SA2.5.7.1 Where proxies are used to score scoring issue (c), the team shall justify their use as reasonable proxies of the exploitation rate.

SA2.6 Information and monitoring PI (PI 1.2.3)

Table SA6: PI 1.2.3 information and monitoring PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Harvest strategy	Information / monitoring 1.2.3 Relevant information is collected to support the harvest strategy.	(a) Range of information	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.
		(b) Monitoring 	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.
		(c) Comprehensiveness of information 		There is good information on all other fishery removals from the stock.	

SA2.6.1 The team should identify which information from the information categories in SA2.6.1.1 is relevant to both the design and effective operational phases of the harvest strategy, Harvest Control Rules and tools, and their evaluation should be based on this information. ❗

SA2.6.1.1 The team shall determine a combined score for this PI on the quality of data available, weighted by information category on the relevance to the harvest strategy, HCR and management tools. Information categories include:

- a. Stock structure;
- b. Stock productivity;
- c. Fleet composition;
- d. Stock abundance;
- e. UoA removals;
- f. Other data.

SA2.6.2 Teams shall interpret “sufficient information” at the SG80 level to mean that all information required to implement the harvest strategy is available at a quality and quantity necessary to demonstrate achievement of the SG80 outcome PI 1.1.1.

SA2.6.3 Teams shall interpret “a comprehensive range of information” and “all information” at the SG100 level to include information provided by a strategic research plan.

SA2.6.3.1 This information shall go beyond the immediate short-term management needs to create a strategic body of research relevant to the long-term UoA-specific management system.

SA2.6.4 The teams shall also consider the veracity of information.

SA2.7 Assessment of stock status PI (PI 1.2.4) 

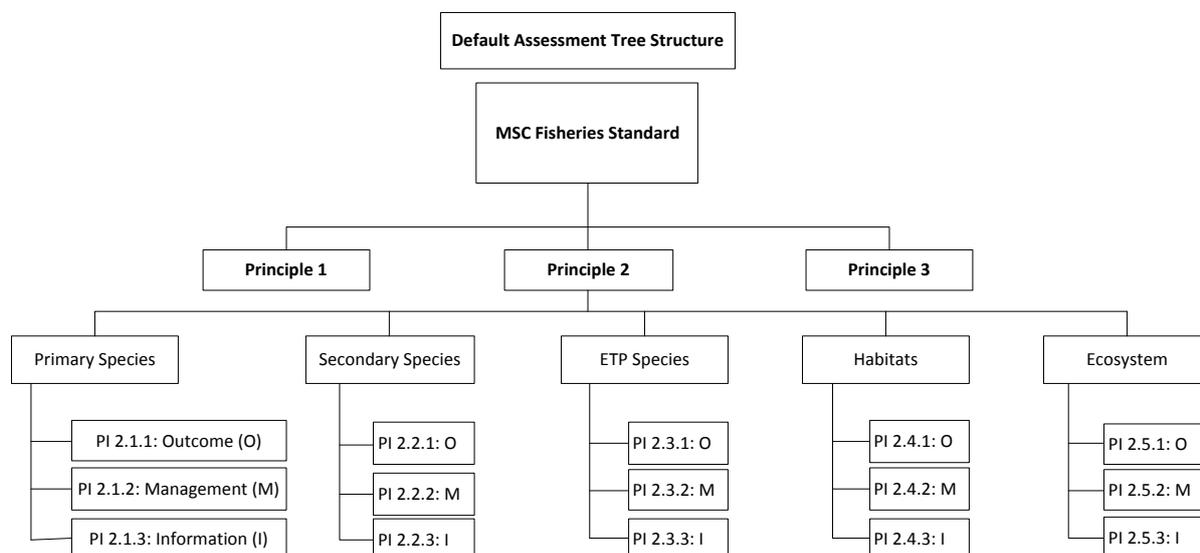
Table SA7: PI 1.2.4 Assessment of stock status PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Harvest strategy	Assessment of stock status 1.2.4 There is an adequate assessment of the stock status.	(a) Appropriateness of assessment to stock under consideration		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.
		(b) Assessment approach	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.	
		(c) Uncertainty in the assessment	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.
		(d) Evaluation of assessment			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
		(e) Peer review of assessment		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.

SA2.7.1 For SG80, when considering an assessment which covers multiple sub-stocks of a single species or a complex of several different species, the team should take into account that the level of assessment required for individual stocks within the stock complex should reflect their ecological importance.

SA3 Principle 2

Figure SA2: Principle 2 Assessment Tree Structure



SA3.1 General requirements for Principle 2

SA3.1.1 The team shall determine and document under which component P2 species will be assessed prior to scoring the Unit of Assessment (UoA).

SA3.1.1.1 Teams shall provide both the common and the scientific name for each main species in a P2 assessment. If applicable, the stock component that each species belongs to shall also be outlined in the report.

SA3.1.2 The team shall consider each P2 species within only one of the primary species, secondary species or ETP species components.

SA3.1.3 The team shall assign primary species in P2 where all the following criteria are met:

SA3.1.3.1 Species in the catch that are not covered under P1 because they are not included in the UoA;

SA3.1.3.2 Species that are within scope of the MSC program as defined in FCR 7.4.1.1; and

SA3.1.3.3 Species where management tools and measures are in place, intended to achieve stock management objectives reflected in either limit or target reference points.

a. In cases where a species would be classified as primary due to the management measures of one jurisdiction but not another that overlaps with the UoA, that species shall still be considered as primary.

SA3.1.4 The team shall assign secondary species in P2 as species in the catch that are within scope of the MSC program but are not covered under P1 because they are not included in the Unit of Assessment and:

- SA3.1.4.1 Are not considered 'primary' as defined in [SA 3.1.3](#); or
- SA3.1.4.2 Species that are out of scope of the program, but where the definition of ETP species is not applicable.
- SA3.1.5 The team shall assign ETP (endangered, threatened or protected) species as follows:
- SA3.1.5.1 Species that are recognised by national ETP legislation;
- SA3.1.5.2 Species listed in the binding international agreements given below:
- a. [Appendix 1 of the Convention on International Trade in Endangered Species \(CITES\)](#), unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered.
 - b. Binding agreements concluded under the Convention on Migratory Species (CMS), including:
 - i. [Annex 1 of the Agreement on Conservation of Albatross and Petrels \(ACAP\)](#);
 - ii. [Table 1 Column A of the African-Eurasian Migratory Waterbird Agreement \(AEWA\)](#);
 - iii. [Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas \(ASCOBANS\)](#);
 - iv. [Annex 1, Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area \(ACCOBAMS\)](#);
 - v. [Wadden Sea Seals Agreement](#);
 - vi. Any other binding agreements that list relevant ETP species concluded under this Convention.
- SA3.1.5.3 Species classified as 'out-of scope' (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).
- SA3.1.6 In PIs 2.1.2 and 2.2.2, the term 'unwanted catch' shall be interpreted by the team as the part of the catch that a fisher did not intend to catch but could not avoid, and did not want or chose not to use.
- SA3.1.7 The team shall consider species used as bait in the UoA, whether they were caught by the UoA or purchased from elsewhere, as either primary or secondary species using the definitions provided under [SA 3.1.3](#) and [SA 3.1.4](#) respectively.
- SA3.1.8 The consideration of the impact of the UoA on all components in P2, including unwanted catch, shall include mortality that is observed and mortality that is unobserved.
- SA3.1.9 The team shall interpret key words or phrases used in P2 as shown in [Table SA8](#).

Table SA8: Principle 2 Phrases

Term	Definition and discussion
Biologically based limits	<p>There is a benchmark against which status of a component can be evaluated, and the benchmark is chosen to provide a high probability of persistence of the species over time.</p> <p>For many fish species this will be equivalent to the point below which recruitment may be impaired (PRI). For others (e.g., out of scope species) this should have the same general intent but alternatives such as minimum viable population size (MVP), Potential Biological Removal (PBR) or other metrics which help determine the sustainability of a population, may be used.</p> <p>The benchmark should be derived from biological information that is relevant to the ecosystem feature and UoA, although the information does not necessarily have to come from the specific area.</p>
Broadly understood	<p>There is a general knowledge of the component's status, the UoA's impact on the component, the component's distribution or the key elements of the component. This general knowledge can be acquired from diverse sources that are relevant to the component and UoA but does not have to be locally derived information.</p>
Does not hinder	<p>The impact of the UoA is low enough that if the species is capable of improving its status, the UoA will not hinder that improvement. It does not require evidence that the status of the species is actually improving.</p>
If necessary	<p>The term "if necessary" is used in the management strategy PIs at SG60 and SG80 for the primary species, secondary species, habitats and ecosystems components. This is to exclude the assessment of UoAs that do not impact the relevant component at these SG levels.</p>
In place	<p>When a measure or strategy is "in place" the measure or strategy has been implemented, and if multiple measures have been identified to address an impact of the UoA, there is a specified process with a clear timetable and endpoint for implementation of all of the measures.</p>
Information is adequate	<p>"Adequate" refers to the quantity and quality of information needed to justify the level of risk or certainty associated with the specific Scoring Guidepost (SG). The adequacy of information may vary for the different information scoring issues and SGs, depending on what the information is used to support.</p>
Measures / Partial Strategy/ Strategy/ Comprehensive Strategy	<p>"Measures" are actions or tools in place that either explicitly manage impacts on the component or indirectly contribute to management of the component under assessment having been designed to manage impacts elsewhere.</p> <p>A "partial strategy" represents a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically.</p> <p>A "strategy" represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and</p>

Term	Definition and discussion
	<p>should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts.</p> <p>A “comprehensive strategy” (applicable only for ETP component) is a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses.</p>
MSC UoAs	Those UoAs that are in assessment or certified at the time the UoA announces its assessment or reassessment on the MSC website.
Objective Basis for Confidence	<p>“Objective basis for confidence”, as used at the SG80 level in the P2 management PIs (Management Strategy Evaluation scoring issue) refers to the levels of information required to evaluate the likelihood that the management partial strategy will work.</p> <ul style="list-style-type: none"> • The SG60 level for these PIs requires “plausible argument” based on expert knowledge; • The SG80 level requires expert knowledge augmented by some information collected in the area of the UoA and about the specific component(s) and/or UoA; • The SG100 level requires all preceding information augmented by relatively complete information on the component, much of which comes from systematic monitoring and/or research.
Serious or irreversible harm to “structure and function”	<p>Serious or irreversible harm to “structure or function” means changes caused by the UoA that fundamentally alter the capacity of the habitat or ecosystem to maintain its structure and function.</p> <p>For the habitat component, this is the reduction in habitat structure, biological diversity, abundance and function such that the habitat would be unable to recover to at least 80% of its unimpacted structure, biological diversity and function within 5-20 years, if fishing were to cease entirely.</p> <p>For the ecosystem component, this is the reduction of key features most crucial to maintaining the integrity of its structure and functions and ensuring that ecosystem resilience and productivity is not adversely impacted. This includes, but is not limited to, permanent changes in the biological diversity of the ecological community and the ecosystem’s capacity to deliver ecosystem services.</p>
Within	“Within” means on the precautionary side of a limit, for example, above B_{LIM} or below F_{LIM} .

SA3.2 General requirements for outcome PIs

SA3.2.1 If a team determines that a UoA has no impact on a particular component, it shall receive a score of 100 under the Outcome PI.

SA3.2.2 The team shall consider both the current outcome status and the resilience of historical arrangements to function adequately and deliver low risk under future conditions when scoring outcome PIs.

SA3.2.3 The definitions of required probability in P2 shall be those in [Table SA9](#). 

Table SA9: Probability required at different scoring guideposts. The language of probability in PI 2.4.1 and 2.5.1 is reversed, but holds the same probability expectation as for PI 2.2.1

Performance indicator	SG60 probability requirement	SG80 probability requirement	SG100 probability requirement
PI 1.1.1	Likely = > 70th %ile	Highly likely = > 80th %ile	High degree of certainty = > 95th %ile
PI 2.1.1	Likely = > 70th %ile	Highly likely = > 80th %ile	High degree of certainty = > 90th %ile
PI 2.2.1	Likely = > 60th %ile	Highly likely = > 70th %ile	High degree of certainty = > 80th %ile
PI 2.3.1	Likely = > 70th %ile	Highly likely = > 80th %ile	High degree of certainty = > 90th %ile
PI 2.4.1	Unlikely = < 40th %ile	Highly unlikely = < 30th %ile	Evidence of highly unlikely = < 20th %ile
PI 2.5.1	Unlikely = < 40th %ile	Highly unlikely = < 30th %ile	Evidence of highly unlikely = < 20th %ile

SA3.2.4 The team shall interpret the phrase ‘above the point where recruitment would be impaired’ in the SGs for primary species as outlined in [SA2.2.3](#) under Principle 1.

SA3.3 General requirements for information PIs !!

SA3.3.1 If a team determines that the UoA has no impact on a particular component and has therefore scored 100 under the Outcome PI, the Information PI shall still be scored.

SA3.3.2 Teams shall interpret the SG100 level relating to “information adequate to support a strategy” to include information provided by a strategic research plan, that addresses the information needs of management. This information shall go beyond the immediate short-term management needs to create a strategic body of research relevant to the long-term fishery-specific management system.

- SA3.4.2.1 The catch of a species by the UoA comprises 5% or more by weight of the total catch of all species by the UoA, or;
- SA3.4.2.2 The species is classified as 'Less resilient' and the catch of the species by the UoA comprises 2% or more by weight of the total catch of all species by the UoA. !!
- a. Teams shall use one or both of the following criteria to determine whether a species should be classified as 'Less resilient'
 - i. The productivity of the species indicates that it is intrinsically of low resilience, for instance, if determined by the productivity part of a PSA that it has a score equivalent to low or medium productivity; or
 - ii. Even if its intrinsic resilience is high, the existing knowledge of the species indicates that its resilience has been lowered due to anthropogenic or natural changes to its life-history. ☐
- SA3.4.3 In the case where individuals are released alive they shall not contribute to the definition of 'main'.!!
- a. Teams shall provide strong scientific evidence of a very low post-capture mortality.
- SA3.4.4 In cases where a species does not meet the designated weight thresholds of 5% or 2% as defined in SA3.4.2.1 and SA3.4.2.2, the assessment team shall still classify a species as main if the total catch of the UoA is exceptionally large, such that even small catch proportions of a P2 species significantly impact the affected stocks/populations. ☐
- SA3.4.5 All other primary species not considered 'main' shall be considered 'minor' species.
- SA3.4.6 At the SG80 level, where a species is below the level at which recruitment could be impaired, the team shall recognise "evidence of recovery" or a "demonstrably effective strategy" as being in place such that all MSC UoAs do not collectively hinder recovery of the species using any or a combination of the following as rationale: !!
- a. Direct evidence from time series estimates of stock status.
 - b. Indirect evidence from time series of indicators or proxies of stock status indicative of the state of the whole stock.
 - c. Indicators, proxies or absolute estimates of exploitation rate that show that fishing mortality experienced by the stock is lower than F_{MSY} .
 - d. Direct evidence that the proportion of combined catch by all MSC UoAs relative to the total catch of the stock does not hinder recovery.
- SA3.4.7 When assessing scoring issue (a), the team shall take into account whether there are any changes in the catch or mortality of unwanted species resulting from the implementation of measures to minimise their mortality (PI 2.1.2 scoring issue (e)). !!

SA3.5 Primary species management strategy PI (PI 2.1.2) !!

Table SA11: PI 2.1.2 Primary species management strategy PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Primary species	Management strategy 2.1.2 There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species; and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.	(a) Management strategy in place <input checked="" type="checkbox"/>	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a strategy in place for the UoA for managing main and minor primary species.
		(b) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ species).	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or species involved.
		(c) Management strategy implementation <input checked="" type="checkbox"/>		There is some evidence that the measures/ partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/ strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a) .
		(d) Shark finning <input checked="" type="checkbox"/>	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.

		(e) Review of alternative measures ☐	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
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SA3.5.1 Teams shall score this PI even if the UoA has no impact on this component. !!

Shark finning

SA3.5.2 If the primary species is a shark, the team shall score scoring issue (d) (following SA2.4.3–SA2.4.7) to ensure that shark finning is not being undertaken in the UoA. ☐

Reviewing measures for unwanted catch

SA3.5.3 If there is unwanted catch as defined in SA3.1.6, the team shall assess scoring issue (e). !!

SA3.5.3.1 “Alternative measures” in scoring issue (e) shall be interpreted by the team as alternative fishing gear and/or practices that have been shown to minimise the rate of incidental mortality of the species or species type to the lowest achievable levels. !!

SA3.5.3.2 “Regular review” in scoring issue (e) shall mean at least once every 5 years. ☐

SA3.5.3.3 “As appropriate” in scoring issue (e) in the context of implementing reviewed measures shall be interpreted by the team as situations where potential alternative measures reviewed are: !!

- a. Determined to be more effective at minimising the mortality of unwanted catch than current fishing gear and practices,
- b. Determined to be comparable to existing measures in terms of effect on target species catch, and impacts on vessel and crew safety,
- c. Determined to not negatively impact on other species or habitats, and
- d. Not cost prohibitive to implement. ☐

SA3.6 Primary species information PI (PI 2.1.3)

Table SA12: PI 2.1.3 Primary species information PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Primary species	<p>2.1.3</p> <p>Information on the nature and amount of primary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species.</p>	<p>(a) Information adequacy for assessment of impact on main primary species </p>	<p>Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status.</p> <p>OR</p> <p>If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.</p>	<p>Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status.</p> <p>OR</p> <p>If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.</p>	<p>Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.</p>
		<p>(b) Information adequacy for assessment of impact on minor primary species </p>			<p>Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.</p>
		<p>(c) Information adequacy for management strategy</p>	<p>Information is adequate to support measures to manage main primary species.</p>	<p>Information is adequate to support a partial strategy to manage main primary species.</p>	<p>Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is</p>

Component	PI	Scoring issues	SG60	SG80	SG100
					achieving its objective.

- SA3.6.1 For any data-deficient scoring elements that have been scored using the RBF, the team shall use the second part of Scoring Issue (a) for those elements.
- SA3.6.2 The team shall report the catch and UoA-related mortality of all main species taken by the UoA together with a description of the adequacy of the information, including identifying data sources used and indicating whether they are qualitative or quantitative.
- SA3.6.2.1 Where a coefficient of variation (CV) or precision of an estimate is known, this shall be included in the description of adequacy of the information delivered.
- SA3.6.2.2 Where a species or proportion of the catch of a species has been assessed by the team to be 'unwanted' as determined under SA3.1.6, the estimates of the proportion of the catch that are unwanted for each of these species shall be indicated.
- SA3.6.3 In scoring issues (a) and (b) teams shall consider the following when determining the adequacy of the information in relation to its ability to determine and to detect changes in the outcome indicator score: !!
- SA3.6.3.1 That higher quality information shall be required to demonstrate adequacy as the importance, or difficulty, of estimating the true impact of the UoA on a species in relation to its status increases. !!
- SA3.6.3.2 That in determining the adequacy of the methods used for data collection, the team shall consider: ☐
- The precision of the estimates (qualitative or quantitative);
 - The extent to which the data are verifiable (on their own or in combination with other data sources);
 - Potential bias in estimates and data collection methods;
 - Comprehensiveness of data; and
 - The continuity of data collection.
- SA3.6.4 For scoring issue (c) teams shall consider the adequacy of information in relation to supporting the management measures, partial strategy or strategy including the ability to detect any changes in risk level to main species, e.g., due to changes in the operation of the UoA or the effectiveness or implementation of the management system. !!

SA3.7 Secondary species outcome PI (PI 2.2.1)

Table SA13: PI 2.2.1 Secondary species outcome PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Secondary species	<p>Outcome Status</p> <p>2.2.1</p> <p>The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biologically based limit.</p>	(a) Main secondary species stock status	<p>Main secondary species are likely to be above biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main secondary species are highly likely to be above biologically based limits</p> <p>OR</p> <p>If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.</p> <p>AND</p> <p>Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a high degree of certainty that main secondary species are above biologically based limits</p>
		(b) Minor secondary species stock status			<p>Minor secondary species are highly likely to be above biologically based limits.</p>

					<p>OR</p> <p>If below biologically based limits there is evidence that the UoA does not hinder the recovery and rebuilding of minor secondary species.</p>
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SA3.7.1 The team shall determine and justify which secondary species are considered 'main' and which are not. 

SA3.7.1.1 For species that are defined as 'in scope', the requirements in SA3.4.2–SA3.4.5 shall apply here.

SA3.7.1.2 For species that are defined as 'out of scope' (amphibians, reptiles, birds, mammals) that are not classified as ETP, all species impacted by the UoA shall be considered 'main'.

a. The requirements in SA3.4.3 shall also apply here

SA3.7.2 The team shall evaluate the evidence of recovery or the demonstrable effectiveness of the strategy in place by following the general approach outlined in SA3.4.6. 

SA3.7.2.1 In the last part of scoring issue (a) at SG80, teams shall consider only the impacts of those MSC UoAs with 'considerable catches'.

SA3.7.2.2 Considerable catches should be interpreted as those where main secondary species comprise more than 10% of the catch by weight of the UoA.

SA3.7.3 When assessing scoring issue (a), the team shall take into account whether there are any changes in the catch or mortality of unwanted species resulting from the implementation of measures to minimise their mortality (PI 2.2.2 scoring issue (e)) 

SA3.8 Secondary species management strategy PI (PI 2.2.2) !!

Table SA14: PI 2.2.2 Secondary species management strategy PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Secondary species	<p>Management strategy</p> <p>2.2.2</p> <p>There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species; and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.</p>	<p>(a) Management strategy in place</p> <p>☐</p>	<p>There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.</p>	<p>There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.</p>	<p>There is a strategy in place for the UoA for managing main and minor secondary species.</p>
		<p>(b) Management strategy evaluation</p>	<p>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ species).</p>	<p>There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or species involved.</p>	<p>Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or species involved.</p>
		<p>(c) Management strategy implementation</p> <p>☐</p>		<p>There is some evidence that the measures/ partial strategy is being implemented successfully.</p>	<p>There is clear evidence that the partial strategy/ strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).</p>

		(d) Shark finning <input checked="" type="checkbox"/>	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
		(e) Review of alternative measures to minimise mortality of unwanted catch	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.

- SA3.8.1 The team shall score this PI even if the UoA has no impact on this component.
- SA3.8.2 If the secondary species is a shark, the team shall score scoring issue (d) (following [SA2.4.3–SA2.4.7](#)) to ensure that shark finning is not being undertaken in the UoA.
- SA3.8.3 For this PI, in addition to determining unwanted catch as defined in clause [SA3.1.6](#), the team shall consider all species that are out of the scope of the programme as defined in FCR 7.4.1.1 as unwanted catch.
- SA3.8.4 In assessing scoring issue (e), clause [SA3.5.3](#) and its sub-clauses shall apply here.

SA3.9 Secondary species information PI (PI 2.2.3)

Table SA15: PI 2.2.3 Secondary species information PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Secondary species	<p>2.2.3</p> <p>Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.</p>	(a) Information adequacy for assessment of impact on main secondary species 	<p>Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status.</p> <p>OR</p> <p>If RBF is used to score PI 2.2.1 for the UoA:</p> <p>Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.</p>	<p>Some quantitative information is available and is adequate to assess the impact of the UoA on the main secondary species with respect to status.</p> <p>OR</p> <p>If RBF is used to score PI 2.2.1 for the UoA:</p> <p>Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.</p>	<p>Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.</p>
		(b) Information adequacy for assessment of impact on minor secondary species 			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
		(c) Information adequacy for management strategy	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .

SA3.9.1 Clauses SA3.6.1–SA3.6.4 shall apply here also, noting that where those clauses refer to primary species they apply here to secondary species. !!

SA3.10 ETP species outcome PI (PI 2.3.1)

Table SA16: PI 2.3.1 ETP species outcome PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
ETP species	Outcome Status 2.3.1 The UoA meets national and international requirements for protection of ETP species.	(a) Effects of the UoA on population/stocks within national or international limits, where applicable !!	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population/stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	The UoA does not hinder recovery of ETP species.	(b) Direct effects	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
		(c) Indirect effects		Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.

SA3.10.1 In scoring issue (a), “where national and/or international requirements set limits” refers to limits set for protection and rebuilding, provided through the national legislation or binding international agreements, as defined in SA3.1.5 and subclauses.

SA3.10.1.1 If there is no applicable national legislation or binding international agreement, scoring issue (a) shall not be scored.

SA3.10.2 The team’s scoring shall reflect the likelihood that the UoA meets these requirements and its likelihood of causing unacceptable impacts.

SA3.10.2.1 The team shall interpret the requirement for the UoA to be “within national or international limits” as:

- a. At SG60, where it is likely that the UoA meets the requirements, there is some evidence that requirements for protection and rebuilding are being achieved.
- b. At SG80, where it is highly likely that the combined MSC UoAs meet the requirements, there would be direct demonstration that requirements for protection and rebuilding are being achieved.
- c. At SG100, there should be full compliance with all requirements, and mortality of ETP species caused by the combined impacts of MSC UoAs should be negligible. In addition, if there are no ETP species caught in the MSC UoAs then the UoA would meet SG 100.

SA3.10.3 When assessing scoring issue (a) and (b), the team shall take into account whether there are any changes in the catch or mortality of ETP species resulting from the implementation of measures to minimise their mortality (PI 2.3.2 scoring issue (e)). 

SA3.11 ETP species management strategy PI (PI 2.3.2) !!

Table SA17: PI 2.3.2 ETP species management strategy PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
ETP species	<p>Management strategy</p> <p>2.3.2</p> <p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> - meet national and international requirements; and - ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>	(a) Management strategy in place (national and international requirements)	There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
		(b) Management strategy in place (alternative)	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
		(c) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ species).	There is an objective basis for confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or the species involved.	The strategy/ comprehensive strategy is mainly based on information directly about the UoA and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
		(d) Management strategy implementation		There is some evidence that the measures/strategy is being	There is clear evidence that the strategy/ comprehensive strategy is being

				implemented successfully.	implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
		(e) Review of alternative measures to minimise mortality of ETP species	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.

SA3.11.1 When scoring the ETP Management Strategy PI SGs teams shall consider the need to minimise mortality. ❗

SA3.11.1.1 All sources of direct mortality shall be considered, including, but not limited to, direct deaths and injuries leading to death.

SA3.11.2 The team shall evaluate either scoring issue (a) or scoring issue (b) on the ETP species management strategy:

SA3.11.2.1 Where there are requirements for protection and rebuilding provided through national ETP legislation or international agreements, the team shall score scoring issue (a).

SA3.11.2.2 Where there are no requirements for protection and rebuilding provided through national ETP legislation or international agreements, the team shall score scoring issue (b).

SA3.11.3 In assessing scoring issue (e), clause [SA3.5.3](#) and its sub-clauses shall apply here, noting that where those clauses refer to mortality of unwanted species they apply here to mortality of ETP species. 🟩

SA3.12 ETP species information PI (PI 2.3.3)

Table SA18: PI 2.3.3 ETP species information PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
ETP species	<p>Information</p> <p>2.3.3</p> <p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> - information for the development of the management strategy; - information to assess the effectiveness of the management strategy; and - information to determine the outcome status of ETP species 	(a) Information adequacy for assessment of impacts	<p>Qualitative information is adequate to estimate the UoA related mortality on ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA</p> <p>Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.</p>	<p>Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA:</p> <p>Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.</p>	<p>Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.</p>
		(b) Information adequacy for management strategy	<p>Information is adequate to support measures to manage the impacts on ETP species</p>	<p>Information is adequate to measure trends and support a strategy to manage impacts on ETP species</p>	<p>Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.</p>

- SA3.12.1 The team should interpret “UoA related mortality” for SG60 and SG80 to mean the mortality in the UoA under assessment.
- SA3.12.2 [SA3.6.1–SA3.6.4](#) shall apply here (except [SA3.6.2.2](#)) noting that the paragraphs apply to all ETP species (i.e., there is no ‘main’ for ETP).

SA3.13 Habitats outcome PI (PI 2.4.1)

Table SA19: PI 2.4.1 Habitats outcome PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Habitats	<p>Outcome status</p> <p>2.4.1</p> <p>The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.</p>	(a) Commonly encountered habitat status	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
		(b) VME habitat status	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
		(c) Minor habitat status			There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.

SA3.13.1 The team shall assess the habitats component in relation to the effects of the UoA on the structure and function of the habitats impacted by the UoA. 

SA3.13.1.1 Where the team does not have enough information to assess SA3.13.1, the RBF (CSA) shall be used. 

SA3.13.1.2 The RBF (CSA) may be used even when there is sufficient information to assess SA3.13.1 but is not mandatory under these circumstances.

SA3.13.2 If a benthic habitat is being assessed, the team shall recognise habitat categories based on the following habitat characteristics: 

- a. Substratum – sediment type (e.g., hard substrate)
- e. Geomorphology – seafloor topography (e.g., flat rocky terrace)
- f. Biota – characteristic floral and/or faunal group(s) (e.g., kelp-dominated seagrass bed and mixed epifauna, respectively)

SA3.13.3 The team shall determine and justify which habitats are commonly encountered, vulnerable marine ecosystems (VMEs), and minor (i.e., all other habitats). ■

SA3.13.3.1 A commonly encountered habitat shall be defined as a habitat that regularly comes into contact with a gear used by the UoA, considering the spatial (geographical) overlap of fishing effort with the habitat's range within the management area(s) covered by the governance body(s) relevant to the UoA. ■

SA3.13.3.2 A VME² shall be defined as is done in paragraph 42 subparagraphs (i)-(v) of the FAO Guidelines³ (definition provided in [GSA3.13.3.2](#)). This definition shall be applied both inside and outside EEZs and irrespective of depth. ■

SA3.13.4 The team shall interpret “serious or irreversible harm” as reductions in habitat structure and function (as defined in [Table SA8](#)) such that the habitat would be unable to recover at least 80% of its structure and function within 5-20 years if fishing on the habitat were to cease entirely. !!

SA3.13.4.1 In the case of VMEs the team shall interpret “serious or irreversible harm” as reductions in habitat structure and function below 80% of the unimpacted level. ■

SA3.13.5 When assessing the status of habitats and the impacts of fishing, the team shall consider the full area managed by the local, regional, national, or international governance body(s) responsible for fisheries management in the area(s) where the UoA operates (the “managed area” for short). !!

SA3.13.5.1 The team shall use all available information (e.g., bioregional information) to determine the range and distribution of the habitat under consideration and whether this distribution is entirely within the “managed area” or extends beyond the “managed area”.

SA3.13.5.2 In cases where a habitat's range falls within the “managed area”, the team shall consider the habitat's range inside the “managed area”.

SA3.13.5.3 In cases where a habitat's range overlaps the “managed area”, the team shall consider the habitat's range both inside and outside the “managed area”.

SA3.13.6 The team shall interpret the terms “unlikely”, “highly unlikely” and “evidence” in SG60, SG80 and SG100 as in [Table SA9](#).

² Throughout the requirements and guidance, the term “VME” also includes “potential VME” to cover situations when a governance body uses a precautionary approach (e.g., where there is doubt over whether a habitat is a VME or not) and when a habitat is being treated as a potential VME.

³ Food and Agriculture Organization of the United Nations. (2009). International guidelines for the management of deep-sea fisheries in the high seas. *FAO, Rome*.

SA3.14 Habitats management strategy PI (PI 2.4.2) 

Table SA20: PI 2.4.2 Habitats management strategy PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Habitats	Management strategy 2.4.2 There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.	(a) Management strategy in place 	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
		(b) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
		(c) Management strategy implementation		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
		(d) Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures

Component	PI	Scoring issues	SG60	SG80	SG100
				afforded to VMEs by other MSC UoAs/ non-MSC fisheries, where relevant.	afforded to VMEs by other MSC UoAs/ non-MSC fisheries, where relevant.

SA3.14.1 The team shall score this PI even if the UoA has no impact on this component. ☑

SA3.14.2 The team shall consider the differences between measures, partial strategy, and strategy as they apply to habitat management. !!

SA3.14.2.1 In scoring issue (a) at the SG100 level, the “strategy” for a UoA that encounters VMEs shall include a comprehensive management plan that is supported by a comprehensive impact assessment that determines that all fishing activities will not cause serious or irreversible harm to VMEs. ☑

SA3.14.2.2 In scoring issue (a) at the SG80 level, the “partial strategy” for a UoA that encounters VMEs shall include, at least, the following points: !!

- a. Requirements to comply with management measures to protect VMEs (e.g., designation of closed areas).
- b. Implementation by the UoA of precautionary measures to avoid encounters with VMEs, such as scientifically based, gear- and habitat-specific move-on rules or local area closures to avoid potential serious or irreversible harm on VMEs.

SA3.14.2.3 In scoring issue (a) at the SG60 level, “measures” for a UoA that encounters VMEs shall include, at least, the following points: ☑

- a. Requirements to comply with management measures to protect VMEs (e.g., designation of closed areas);
- b. Implementation by the UoA of precautionary measures to avoid encounters with VMEs, based on commonly accepted move-on rules.

SA3.14.3 The team shall score scoring issue (d) if the UoA impacts a VME and/or if another MSC UoA or non-MSC fishery, where relevant, impacts a VME within the UoA’s “managed area” (as defined in SA3.13.5). ☑

SA3.14.3.1 To avoid the possibility that the cumulative impact of MSC UoAs could cause serious or irreversible harm to VMEs, for scoring issue (d), the team shall assess the extent to which the UoA:

- a. Takes into account and implements, where relevant, precautionary protection measures implemented by other MSC UoAs (such as closed areas arising from move-on rules);
- b. Takes into account information from non-MSC fisheries, where available and where relevant.

SA3.14.3.2 A determination of “where relevant” shall include: ☑

- a. Consideration only of areas where closure is clearly aimed (i.e., based on scientific rationale and best practice) at precautionary protection of VMEs and not closures that are designed for other purposes;

- b. Avoidance of closed areas arising from move-on rules and consideration of other measures implemented by all MSC UoAs;
- c. Avoidance of any relevant move-on areas implemented by non-MSC fisheries if the area coordinates are available (e.g., made publicly available by the non-MSC fisheries' management entity).

SA3.14.4 When assessing scoring issue (d), the team shall interpret the different levels of “evidence” in relation to the availability of electronic or other verified data consistent with the scale and intensity of the UoA, which enables the UoA to implement the requirements effectively with respect to VMEs. 

SA3.15 Habitats information PI (PI 2.4.3) !!

Table SA21: PI 2.4.3 Habitats information PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Habitats	<p>Information / monitoring</p> <p>2.4.3</p> <p>Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.</p>	(a) Information quality	<p>The types and distribution of the main habitats are broadly understood.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
		(b) Information adequacy for assessment of impacts	<p>Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to</p>	<p>Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and</p>	The physical impacts of the gear on all habitats have been quantified fully.

Component	PI	Scoring issues	SG60	SG80	SG100
			estimate the consequence and spatial attributes of the main habitats.	spatial attributes of the main habitats.	
		(c) Monitoring !!		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.

- SA3.15.1 The team shall score this PI even if the UoA has no impact on this component.
- SA3.15.2 The team shall determine and justify which habitats are considered “main” and which are not. [SA3.13.3.1](#) and [SA3.13.3.2](#) apply here. 
- SA3.15.3 For any data-deficient scoring elements that have been scored using the CSA, the team shall use the second part of the scoring issues (a) and (b) for the SG60 and SG80 levels. !!
- SA3.15.4 The team shall interpret “vulnerability” for the SG80 and SG100 levels to mean the combination of:
- SA3.15.4.1 The likelihood that the gear would encounter the habitat, and
 - SA3.15.4.2 The likelihood that the habitat would be altered if an encounter between the gear and the habitat did occur.
- SA3.15.5 The SG100 level does not include the qualifier “main”, and the team shall consider all habitats in the assessment.
- SA3.15.6 For UoAs encountering VMEs, scoring issue (b) at the SG80 level should, at least, include the following information:
- a. Maps and specific position information relating to the UoA’s footprint.
 - b. Position of closed areas to protect VMEs.
 - c. Position of closed areas that were established by the UoA, other MSC UoAs, and non-MSC fisheries fishing in the area as a precautionary measure, subject to the provisions of [SA3.14.3.2](#).
 - d. Catch and catch rates of VME-indicator organisms and information to support the scientific definition of precautionary trigger levels, where these are used.
- SA3.15.6.1 The level of detail required by SA3.15.6 shall be judged against the requirements of the partial strategy or strategy and against the scale and size of the UoA.

SA3.16 Ecosystem outcome PI (PI 2.5.1)

Table SA22: PI 2.5.1 Ecosystem outcome PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Ecosystem	Outcome Status 2.5.1 The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.	(a) Ecosystem status	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.

- SA3.16.1 The team shall score the other components of the assessment (i.e., P1 target species, primary species, secondary species, ETP species and habitats) separately to this PI, which considers the wider ecosystem structure and function.
- SA3.16.2 The team shall interpret serious or irreversible harm to structure and function as outlined in [Table SA8](#). 
- SA3.16.3 The team should note that “key” ecosystem elements are the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the UoA. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity.
- SA3.16.4 The team shall interpret the terms “unlikely”, “highly unlikely” and “evidence for” in SG60, SG80 and SG100 as in [Table SA9](#).
- SA3.16.5 The team should make sure that:
- SA3.16.5.1 Where the team uses qualitative analysis and/or expert judgements in scoring a UoA at the SG60 and SG80 SGs this should be approximately equivalent to the quantitative probability interpretation given in [Table SA9](#).
 - a. The justification for equivalence shall be provided.
 - b. A range of informed viewpoints or alternative hypotheses may be used to make qualitative judgements about the probability interpretation of the SG.
 - c. The team may consider using the SICA to assess this PI as a means of obtaining the range of viewpoints and constructing the probability interpretation of the SG.

SA3.17 Ecosystem management strategy PI (PI 2.5.2) 

Table SA23: PI 2.5.2 Ecosystem management strategy PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Ecosystem	Management strategy 2.5.2 There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.	(a) Management strategy in place	There are measures in place, if necessary which take into account the potential impacts of the UoA on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
		(b) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved
		(c) Management strategy implementation		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .

- SA3.17.1 The team shall note that the measures required by SG60 may exist primarily to manage the impact on target species or other components, but have the capacity to achieve ecosystem outcomes.
- SA3.17.2 The team shall note that the plan and measures in place at SG100 should be based on well-understood functional relationships between the UoA and the components and elements of the ecosystem.
- SA3.17.2.1 The plan should provide for the development of a full strategy that restrains impacts on the ecosystem to ensure the UoA does not cause serious or irreversible harm.
- SA3.17.3 The team shall note that for SG80 and SG100, partial strategies and strategies respectively may also contain measures designed and implemented to address impacts on components that have been evaluated elsewhere in this framework.
- SA3.17.3.1 If the measures address specific ecosystem impacts effectively enough to meet the appropriate standard, then it is not necessary to have special “ecosystem measures” to address the same impacts.
- SA3.17.3.2 It may not be necessary to have a specific “ecosystem strategy” other than that which comprises the individual strategies for the other components under P1 and P2.
- SA3.17.3.3 If there are ecosystem impacts that may not be addressed effectively by existing measures, it may be necessary to add new measures or strengthen existing ones to address those impacts.

SA3.18 Ecosystem information PI (PI 2.5.3)

Table SA24: PI 2.5.3 Ecosystem information PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Ecosystem	Information / monitoring 2.5.3 There is adequate knowledge of the impacts of the UoA on the ecosystem.	(a) Information quality	Information is adequate to identify the key elements of the ecosystem	Information is adequate to broadly understand the key elements of the ecosystem.	
		(b) Investigation of UoA impacts	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .
		(c) Understanding of component functions		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .
		(d) Information relevance		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
		(e) Monitoring		Adequate data continue to be collected to detect any	Information is adequate to support the development of strategies to

Component	PI	Scoring issues	SG60	SG80	SG100
				increase in risk level.	manage ecosystem impacts.

SA3.18.1 In scoring issue (b), the team shall: 

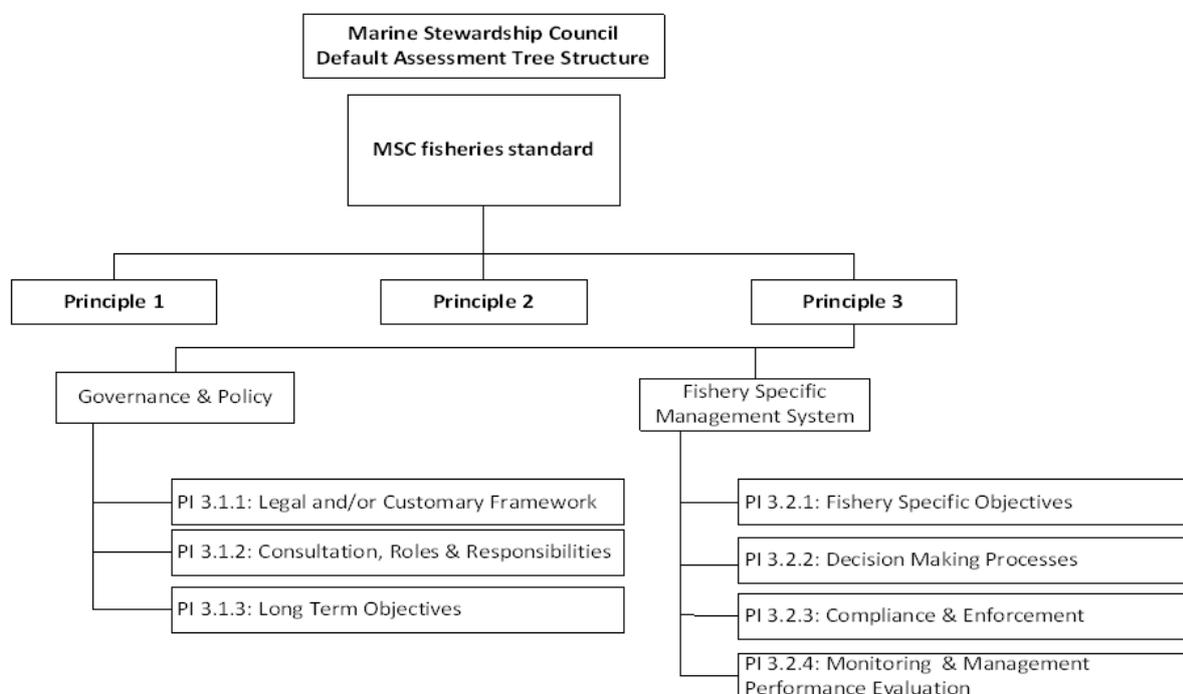
SA3.18.1.1 Require some information of “the main impacts of the UoA on these key ecosystem elements” at the SG80 level.

SA3.18.1.2 Focus on the “main interactions between the UoA and these ecosystem elements” at the SG100 level. At this level:

- d. UoAs should be capable of adapting management to environmental changes as well as managing the effect of the UoA on the ecosystem.
- e. Monitoring the effects of environmental change on the natural productivity of the UoAs should be considered best practice and should include recognition of the increasing importance of climate change.

SA4 Principle 3

Figure SA3: Principle 3 default tree structure



SA4.1 General requirements for Principle 3

- SA4.1.1 Teams shall determine and state which jurisdictional category or combination of jurisdictional categories apply to the management system of the UoA, including consideration of formal, informal and/or traditional management systems when assessing performance of UoAs under Principle 3, including: !!
- Single jurisdiction;
 - Single jurisdiction with indigenous component;
 - Shared stocks;
 - Straddling stocks;
 - Stocks of highly migratory species (HMS);
 - Stocks of discrete high seas non-HMS.
- SA4.1.2 UoAs subject to international cooperation to manage stocks as well as UoAs not subject to international cooperation to manage stocks shall be subject to evaluation under P3 Performance Indicators.
- SA4.1.3 The performance of other fisheries' management bodies where they are also subject to international cooperation to manage the stock shall not be individually assessed, except where they impact directly on P1 and P2 outcomes and/or P3 implementation. !!

- SA4.1.4 When scores are based on the consideration of informal or traditional management systems, the team shall provide, in the rationale, evidence demonstrating the validity and robustness of the conclusions by: 
- a. Using different methods to collect information.
 - b. Cross checking opinions and views from different segments of the stakeholder community.
- SA4.1.5 Teams shall consider the scale and intensity of the UoA in determining the appropriateness of the management system.

SA4.2 Principle 3 Terminology

- SA4.2.1 The term “explicit” as used in the Principle 3 scoring guideposts is not applicable solely to formally codified or documented management measures and mechanisms.
- SA4.2.2 The term “explicit” shall also refer to informal management measures and mechanisms that are well established and effective.
- SA4.2.3 In scoring management performance in the continuum from implicit to explicit, the team shall consider:
- SA4.2.3.1 The extent to which such management measures, whether formal or informal, are established in the UoA,
 - SA4.2.3.2 How well they are understood and applied by users within the UoA, and
 - SA4.2.3.3 The extent to which such measures are considered durable and unambiguous.

SA4.3 Legal and/or customary framework PI (PI 3.1.1)

Table SA25: PI 3.1.1 Legal and/or customary framework PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Governance and policy	<p>Legal and/or customary framework</p> <p>3.1.1</p> <p>The management system exists within an appropriate and effective legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> - 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 	<p>(a)</p> <p>Compatibility of laws or standards with effective management </p>	<p>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.</p>	<p>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.</p>	<p>There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.</p>
		<p>(b)</p> <p>Resolution of disputes </p>	<p>The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.</p>	<p>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.</p>	<p>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.</p>

Component	PI	Scoring issues	SG60	SG80	SG100
	-Incorporates an appropriate dispute resolution framework.	(c) Respect for rights	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.

SA4.3.1 The team shall focus scoring on whether or not there is an appropriate and effective legal and/or customary framework that is capable of delivering sustainability in the UoA(s) in accordance with P1 and P 2.

SA4.3.2 At the SG60 level for scoring issue (a), teams shall interpret compatibility with laws and standards as follows:

- SA4.3.2.1 For a UoA not subject to international cooperation for management of the stock this means:
- a. The existence of national laws, agreements and policies governing the actions of all the authorities and actors involved in managing the UoA, and
 - b. That these laws, agreements and/or policies provide a framework for cooperation between national entities (e.g., between regional and national management, state and federal management, indigenous and other groups) on national management issues, as appropriate for the context, size, scale or intensity of the UoA.

- SA4.3.2.2 For a UoA subject to international cooperation for management of the stock (e.g.: shared, straddling, HMS, high seas non-HMS) this means the existence of:
- a. National and international laws, arrangements, agreements and policies governing the actions of the authorities and actors involved in managing the UoA, and
 - b. A framework for cooperation with other territories, sub-regional or regional fisheries management organisations, or
 - c. Other bilateral/multilateral arrangements that create the cooperation required to deliver sustainable management under the obligations of UNCLOS Articles 63(2), 64, 118, 119, and UNFSA Article 8.

- SA4.3.2.3 Cooperation shall at least deliver the intent of UNFSA Article 10 paragraphs relating to:
- a. The collection and sharing of scientific data,
 - b. The scientific assessment of stock status, and
 - c. Development of scientific advice.
- SA4.3.2.4 The flag state of participants in the UoA shall have at least cooperating non-member status within a relevant sub-regional or regional fisheries management organisation or other bilateral/ multilateral arrangement, if such exists.
- SA4.3.3 At the SG80 level for scoring issue (a), teams shall interpret consistency with laws and standards as follows:
- SA4.3.3.1 For a UoA not subject to international cooperation for management of the stock, this means:
- a. The existence of national laws, agreements and policy governing the actions of all the authorities and actors involved in managing the UoA, and
 - b. That these laws, agreements and/or policies also provide for organised cooperation between national entities (e.g., between regional and national management, state and federal management, indigenous and other groups) on national management issues.
- SA4.3.3.2 For a UoA subject to international cooperation for management of the stock this means:
- a. The existence of national and international laws, agreements and policies governing the actions of the authorities and actors involved in managing the UoA,
 - b. That effective regional and/or international cooperation creates a comprehensive cooperation under the obligations of UNCLOS Articles 63(2), 64, 118, 119, and UNFSA Article 8,
 - c. That cooperation shall at least deliver the intent of UNFSA Article 10 paragraphs relating to the collection, sharing and dissemination of scientific data, the scientific assessment of stock status and development of management advice, the agreement and delivery of management actions consistent with this sustainable management advice, and on monitoring and control, and
 - d. That the flag state of fishery participants in the UoA shall be members of the relevant organisation or participants in the arrangement, or agree to apply the conservation and management measures established by the organisation or arrangement if such organisation or arrangement exists.
- SA4.3.4 At the SG100 level for scoring issue (a), teams shall interpret consistent with laws and standards as follows:
- SA4.3.4.1 For a UoA not subject to international cooperation for management of the stock, this means:
- a. The existence of national laws, agreements and policies governing the actions of all the authorities and actors involved in managing the UoA; and

- b. That these laws, agreements and/or policies also provide for a formal system for the cooperation between national entities (e.g., between regional and national management, state and federal management, indigenous and other groups) on national management issues.
- SA4.3.4.2 For a UoA subject to international cooperation for management of the stock, this means:
 - a. The existence of national laws, agreements and policies governing the actions of the authorities and actors involved in managing the UoA,
 - b. That binding legislation exists governing comprehensive international cooperation under the obligations of UNCLOS Articles 63(2), 64, 118, 119, and UNFSA Articles 8 and 10, and
 - c. That cooperation under the RFMO/arrangement, and the actions of the RFMO, shall demonstrably and effectively deliver UNFSA Article 10.
- SA4.3.4.3 The team shall interpret across SGs 60, 80 and 100 that “effective national legal system” means that the client can provide objective evidence that most of the essential features and elements needed to deliver sustainable fisheries are present in:
 - a. A coherent, logical set of practices or procedures, or
 - b. Within a coherent, logical supporting ‘rule-making’ structure.
- SA4.3.5 For scoring issue (c), the team shall not make their own judgements or unilateral decisions about whether or not custom or national treaties relating to aboriginal or indigenous people have conferred rights upon any particular group or individual.
 - SA4.3.5.1 The use of the term “treaties”, in relation to scoring issue (c), shall not include international treaties or treaties between states or nations, and is limited, in this context to national treaties relating specifically to aboriginal or indigenous people. ☐
- SA4.3.6 The team shall interpret “generally respect” in scoring issue (c) at SG60 to mean that there is some evidence that the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood, and their long term interests, are considered within the legal and/or customary framework for managing fisheries. ☐
- SA4.3.7 The team shall interpret “observe” in scoring issue (c) at SG80 to mean that:
 - SA4.3.7.1 There are more formal arrangements such as bylaws or regulation that make explicit the requirement to consider the legal rights created explicitly or by custom of people dependent on fishing for food or livelihood; and
 - SA4.3.7.2 Those peoples’ long-term interests are taken into account within the legal and/or customary framework for managing fisheries.
- SA4.3.8 The team shall interpret “formally commit” in scoring issue (c) at SG100 to mean that the client can demonstrate a mandated legal basis where rights are fully codified within the fishery management system and/or its policies and procedures for managing fisheries under a legal framework.

SA4.4 Consultation, roles and responsibilities PI (PI 3.1.2)

Table SA26: PI 3.1.2 Consultation, roles and responsibilities PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Governance and policy	<p>Consultation, roles and responsibilities</p> <p>3.1.2</p> <p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties.</p>	<p>(a)</p> <p>Roles and responsibilities </p>	<p>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.</p>	<p>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.</p>	<p>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.</p>
		<p>(b)</p> <p>Consultation processes </p>	<p>The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.</p>	<p>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.</p>	<p>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.</p>

Component	PI	Scoring issues	SG60	SG80	SG100
		(c) Participation		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.

- SA4.4.1 Teams shall focus scoring on the effectiveness and transparency of the consultation processes implemented by fishery managers to obtain and consider information from a wide range of sources, including local knowledge, for input into a broad range of decisions, policies and practices within the management system. ■
- SA4.4.2 Teams shall not focus scoring under this PI on the type of information obtained, or on mandating for what or how it must be used.
- SA4.4.3 Teams shall verify that consultation processes within the management system include consideration of consultation processes at the management system level as well as fishery-specific management systems that occur within it. ■
- SA4.4.4 Consultation processes that exist at a multinational level and a national level shall be included and considered, subject to SA4.1.3. ■
- SA4.4.5 Teams shall interpret “local knowledge” to mean: qualitative, and/or anecdotal, and/or quantitative information, and/or data that come from individuals or groups local to the fisheries managed under the UoAs’ management system. ■

SA4.5 Long term objectives PI (PI 3.1.3)

Table SA27: PI 3.1.3 Long term objective PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Governance and policy	<p>Long term objectives</p> <p>3.1.3</p> <p>The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach.</p>	<p>(a)</p> <p>Objectives</p> <p>!!</p>	<p>Long term objectives to guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are implicit within management policy.</p>	<p>Clear long term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are explicit within management policy.</p>	<p>Clear long term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are explicit within management policy</p>

SA4.5.1 The team shall interpret management policy to mean outside the specific UoA (i.e., at a higher level or within a broader context than the fishery-specific management system).

SA4.5.2 The team shall interpret the precautionary approach for the purposes of scoring this PI to mean being cautious when information is uncertain, unreliable or inadequate and that the absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.

SA4.6 Fishery-specific management system PIs

SA4.6.1 The team shall ensure that all aspects of the fishery-specific management system are appropriate to the scale, intensity and cultural context of the fishery.

SA4.7 Fishery-specific objectives PI (PI 3.2.1)

Table SA28: PI 3.2.1 Fishery specific objectives PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery-specific management system	<p>Fishery-specific objectives</p> <p>3.2.1</p> <p>The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.</p>	<p>(a)</p> <p>Objectives </p>	<p>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.</p>	<p>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.</p>	<p>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.</p>

SA4.7.1 The team shall verify that the individual harvest or management strategies that are scored in PIs under P1 and P2 are consistent with the fishery-specific objectives being scored under P3.

SA4.7.1.1 The objectives shall be assessed under this PI and the strategies that implement the objectives shall be assessed under P1 and P2.

SA4.7.2 The team shall interpret "measurable" at SG100 to mean that in addition to setting fishery-specific objectives that make broad statements objectives are operationally defined in such a way that the performance against the objective can be measured. 

SA4.8 Decision-making processes PI (PI 3.2.2)

Table SA29: PI 3.2.2 Decision making processes PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery-specific management system	<p>3.2.2</p> <p>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.</p>	(a) Decision-making processes 	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.	
		(b) Responsiveness of decision-making processes	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.
		(c) Use of precautionary approach		Decision-making processes use the precautionary approach and are based on best available information.	
		(d) Accountability and transparency of management system and decision	Some information on the fishery's performance and management action is generally	Information on the fishery's performance and management action is available on	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and

Component	PI	Scoring issues	SG60	SG80	SG100
		making process !!	available on request to stakeholders	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.	management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
		(e) Approach to disputes !!	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.

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.

SA4.8.3 The team shall verify that at SG100 resulting measures and strategies from decision-making processes should involve comprehensive, integrated measures or holistic strategies, rather than individual or single measures.

SA4.8.4 In assessing the performance and management actions of the fishery in scoring issue (d) “Accountability and transparency of management system and decision making process”, the team should consider the extent to which transparency and accountability is embedded within the management system.

SA4.8.4.1 Teams should consider public access to information on the fishery’s performance and fisheries data.

- SA4.8.4.2 The team should consider availability of information to stakeholders on actions taken by management that have implications for sustainable use of fisheries resources.
- SA4.8.4.3 The team should consider the transparency of the decision making process, so that it is clear to all stakeholders that decisions were arrived at based on available evidence and due process.
- SA4.8.5 At the SG60 level, at least a general summary of information on subsidies, allocation, compliance and fisheries management decisions should be available to stakeholders on request.
- SA4.8.6 At the SG80 level, in addition to the information provided at the SG60 level, information on decisions, fisheries data supporting decisions, and the reasons for decisions, should be made available to all stakeholders on request.
- SA4.8.7 At the SG100 level, the information listed in the SG60 and SG80 levels should be comprehensive and available openly, publicly and regularly to all stakeholders.

SA4.9 Compliance and enforcement PI (PI 3.2.3)

Table SA30: PI 3.2.3 Compliance and enforcement PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery-specific management system	<p>Compliance and enforcement</p> <p>3.2.3</p> <p>Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.</p>	(a) MCS implementation	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.
		(b) Sanctions 	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.
		(c) Compliance 	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.
		(d) Systematic non-compliance		There is no evidence of systematic non-compliance.	

- 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. 
- SA4.9.2 The team’s judgement on this PI shall be informed, to the extent possible, by independent and credible information from relevant compliance and enforcement agencies or individuals and/or stakeholders.
- SA4.9.3 The team shall, at SG100 for scoring issue (a), consider if the monitoring, control and surveillance systems are comprehensive in relation to their coverage, the independence of the systems and the internal checks and balances.

SA4.10 Monitoring and management performance evaluation PI (PI 3.2.4)

Table SA31: PI 3.2.4 Monitoring and management performance evaluation PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery-specific management system	Monitoring and management performance evaluation 3.2.4	(a) Evaluation coverage	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system.	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
	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.	(b) Internal and/or external review	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.

SA4.10.1 Teams shall interpret “external review” at SG80 and 100 to mean external to the fishery specific management system, but not necessarily international. 

SA4.10.2 Teams should interpret “occasional” and “regular” relative to the intensity of the UoA.

End of Annex SA

Annex SB Modifications to the Default Tree for Enhanced Bivalve Fisheries – Normative

Modifications to the default tree structure to be used in enhanced bivalve fishery assessments.

SB1 General

SB1.1 Modifications to the default tree

- SB1.1.1 Teams shall apply Annex SB as a supplement to [Annex SA](#) in all enhanced bivalve fishery assessments.
- SB1.1.2 Only additions or modifications to the default assessment tree and requirements in Annex SA are included in this Annex.
 - SB1.1.2.1 Unless specifically noted, all other Annex SA PISGs and requirements apply.

SB2 Principle 1

SB2.1 General requirements for Principle 1

- SB2.1.1 Teams shall clearly define in the “MSC Notification Report Form” (FCR 7.8.7.1) which type of enhanced bivalve fishery will be assessed.
- SB2.1.2 Teams shall make an initial evaluation of whether there is evidence that an enhanced catch-and-grow (CAG) bivalve fishery negatively impacts the parent stock. 
- SB2.1.3 Teams shall assume that CAG fisheries that involve translocations may impact the parent stock. 
- SB2.1.4 If an enhanced CAG bivalve fishery does not involve translocations, and there is no evidence that it negatively impacts the parent stock, teams may choose not to score Principle 1.
 - SB2.1.4.1 The team shall include a rationale for this decision in the MSC Notification Report Form, and Full Assessment Report.
 - SB2.1.4.2 If Principle 1 is not to be scored, Row 1 in Table PC3 is not applicable.
- SB2.1.5 If there are translocations within an enhanced CAG bivalve fishery, Principle 1 PIs shall be scored in accordance with the RBF requirements.
 - SB2.1.5.1 The assessment shall be conducted on all sources of seed stock used in the fishery.
 - SB2.1.5.2 Enhanced CAG bivalve fisheries that involve translocations shall also be scored against the Genetic outcome PI 1.1.3.
- SB2.1.6 Bivalve fisheries involving hatchery enhancement assessed as hatch-and-catch (HAC) fisheries shall be scored against Principle 1 PIs in accordance with the

default assessment tree or the RBF requirements specified in [Annex SA](#) or [Annex PF](#), respectively.

SB2.1.6.1 Enhanced HAC bivalve fisheries shall also be scored against the Genetics PIs 1.1.3, 1.2.5, and 1.2.6.

SB2.2 Genetics

Table SB1: PI 1.1.3 Genetics component

Component	PI	Scoring issues	SG60	SG80	SG100
Genetics	Genetic Outcome 1.1.3 The fishery has negligible discernible impact on the genetic structure of the population.	(a) Genetic impact of enhancement activity	The fishery is unlikely to impact genetic structure of wild populations to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to impact genetic structure of wild populations to a point where there would be serious or irreversible harm.	An independent peer-reviewed scientific assessment confirms with a high degree of certainty that there are no risks to the genetic structure of the wild population associated with the enhancement activity.

Table SB2: PI 1.2.5 Genetics component

Component	PI	Scoring issues	SG60	SG80	SG100
Genetics	<p>Genetic Management</p> <p>1.2.5</p> <p>There is a strategy in place for managing the hatchery enhancement activity such that it does not pose a risk of serious or irreversible harm to the genetic diversity of the wild population.</p>	(a) Genetic management strategy in place	There are measures in place, if necessary, which are expected to maintain the genetic structure of the population at levels compatible with the SG80 Genetic outcome level of performance (PI 1.1.3).	There is a partial strategy in place, if necessary, which is expected to maintain the genetic structure of the population at levels compatible with the SG80 Genetic outcome level of performance (PI 1.1.3).	There is a strategy in place to maintain the genetic structure of the population at levels compatible with the SG80 Genetic outcome level of performance (PI 1.1.3).
		(b) Genetic management strategy evaluation	The measures are considered likely to work based on plausible argument (e.g., general experience, theory, or comparison with similar fisheries/ species).	There is some objective basis for confidence that the partial strategy will work based on information directly relevant to the population(s) involved.	The strategy is based on in-depth knowledge of the genetic structure of the population, and testing supports high confidence that the strategy will work.
		(c) Genetic management strategy implementation		There is some evidence that the partial strategy is being implemented successfully, if necessary.	There is clear evidence that the strategy is being implemented successfully . There is some evidence that the strategy is achieving its overall objective .

Table SB3: PI 1.2.6 Genetics component

Component	PI	Scoring issues	SG60	SG80	SG100
Genetics	Genetic Information 1.2.6 Information on the genetic structure of the population is adequate to determine the risk posed by the enhancement activity and the effectiveness of the management of genetic diversity.	(a) Information quality	Qualitative or inferential information is available on the genetic structure of the population Information is adequate to broadly understand the likely impact of hatchery enhancement.	Qualitative or inferential information and some quantitative information are available on the genetic structure of the population. Information is sufficient to estimate the likely impact of hatchery enhancement.	The genetic structure of the population is understood in detail . Information is sufficient to estimate the impact of hatchery enhancement with a high degree of certainty .
		(b) Information adequacy for genetic management strategy	Information is adequate to support measures to manage main genetic impacts of the enhancement activity on the stock, if necessary.	Information is adequate to support a partial strategy to manage the main genetic impacts of the enhancement activity on the stock, if necessary.	Information is adequate to support a comprehensive strategy to manage the genetic impacts of the enhancement activity on the stock and evaluate with a high degree of certainty whether the strategy is achieving its objective.

SB3 Principle 2

SB3.1 General requirements for Principle 2

- SB3.1.1 Enhanced CAG bivalve fisheries based solely on spat collection shall not be scored for the primary or secondary species PIs.
- SB3.1.1.1 Enhanced CAG bivalve fisheries involving dredging for seed shall be scored against the primary or secondary species PIs as per the requirements found in [Annex SA](#).
- SB3.1.2 For enhanced CAG bivalve fisheries, PIs for ETP species shall be scored as per the requirements found in [Annex SA](#).
- SB3.1.3 For enhanced CAG bivalve fisheries, PIs for habitats and ecosystems shall be scored as per the requirements found in [Annex SA](#) with assessment teams taking into account the specific habitat and ecosystem impacts associated with enhanced CAG bivalve fisheries.
- SB3.1.3.1 For suspended culture systems, scoring shall consider the habitat impacts of bio-deposition and benthic organic enrichment and the ecosystem and carrying capacity impacts of localized phytoplankton depletion from bivalve filtration.
- SB3.1.4 If an enhanced CAG bivalve fishery in assessment involves the translocation of seed or adult shellfish, the assessment team shall score the fishery against the Translocation PISGs 2.6.1, 2.6.2, and 2.6.3.
- SB3.1.5 Principle 2 PIs from the default tree shall be scored for all sources of seed stock for CAG bivalve fisheries involving translocations.

SB3.2 Translocations

Table SB4: PI 2.6.1 Translocation component

Component	PI	Scoring issues	SG60	SG80	SG100
Translocation	Translocation Outcome 2.6.1 The translocation activity has negligible discernible impact on the surrounding ecosystem.	(a) Impact of translocation activity	The translocation activity is unlikely to introduce diseases, pests, pathogens, or non-native species (species not already established in the ecosystem) into the surrounding ecosystem.	The translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.	There is evidence that the translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.

Table SB5: PI 2.6.2 translocation component

Component	PI	Scoring issues	SG60	SG80	SG100
Translocation	Translocation Management 2.6.2 There is a strategy in place for managing translocation s such that the fishery does not pose a risk of serious or irreversible harm to the surrounding ecosystem.	(a) Translocation management strategy in place	There are measures in place which are expected to protect the surrounding ecosystem from the translocation activity at levels compatible with the SG80 Translocation outcome level of performance (PI 2.6.1).	There is a partial strategy in place, if necessary, that is expected to protect the surrounding ecosystem from the translocation activity at levels compatible with the SG80 Translocation outcome level of performance (PI 2.6.1).	There is a strategy in place for managing the impacts of translocation on the surrounding ecosystem.
		(b) Translocation management strategy evaluation	The measures are considered likely to work based on plausible argument (e.g., general experience, theory, or comparison with similar fisheries/species).	A valid documented risk assessment or equivalent environmental impact assessment demonstrates that the translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.	An independent peer-reviewed scientific assessment confirms with a high degree of certainty that there are no risks to the surrounding ecosystem associated with the translocation activity.

Component	PI	Scoring issues	SG60	SG80	SG100
		(c) Translocation contingency measures		Contingency measures have been agreed in the case of an accidental introduction of diseases, pests, pathogens, or non-native species due to the translocation.	A formalised contingency plan in the case of an accidental introduction of diseases, pests, pathogens, or non-native species due to the translocation is documented and available.

Table SB6: PI 2.6.3 Translocation component

Component	PI	Scoring issues	SG60	SG80	SG100
Translocation	Translocation Information 2.6.3 Information on the impact of the translocation activity on the environment is adequate to determine the risk posed by the fishery.	(a) Information quality	Information is available on the presence or absence of diseases, pests, pathogens, and non-native species at the source and destination of the translocated stock to guide the management strategy and reduce the risks associated with the translocation.	Information is sufficient to adequately inform the risk and impact assessments required in the SG80 Translocation management level of performance (PI 2.6.2).	Information from frequent and comprehensive monitoring demonstrates no impact from introduced diseases, pests, and non-native species with a high degree of certainty .

SB4 Principle 3

SB4.1 General requirements for Principle 3

SB4.1.1 With the exception of CAG fisheries where P1 is not scored, enhanced bivalve fisheries shall be scored against Principle 3 PIs as per the requirements found in [Annex SA](#).

SB4.1.2 In cases where P1 is not scored, assessment teams shall focus P3 scoring on whether or not the appropriate and effective legal and/or customary framework is capable of delivering sustainable fisheries in accordance with P2 PISGs.

End of Annex SB

Annex SC: Modifications to the Default Assessment Tree for Salmon Fisheries – Normative

Modifications to the default tree structure, including the PISGs for each of the three MSC Principles to be used in salmon fishery assessments. 

SC1 General

SC1.1 General requirements

SC1.1.1 CABs shall apply Annex SC as a supplement to [Annex SA](#) in all salmon fishery assessments. 

SC1.1.1.1 Only additions or modifications in relevant sections of the default assessment tree and requirements are included herein.

SC1.1.2 Salmon fisheries shall be scored against all scoring issues and PIs presented in Annex SC. 

SC1.1.3 The team shall interpret key words or phrases as used in Annex SC as shown in [Table SC1](#). 

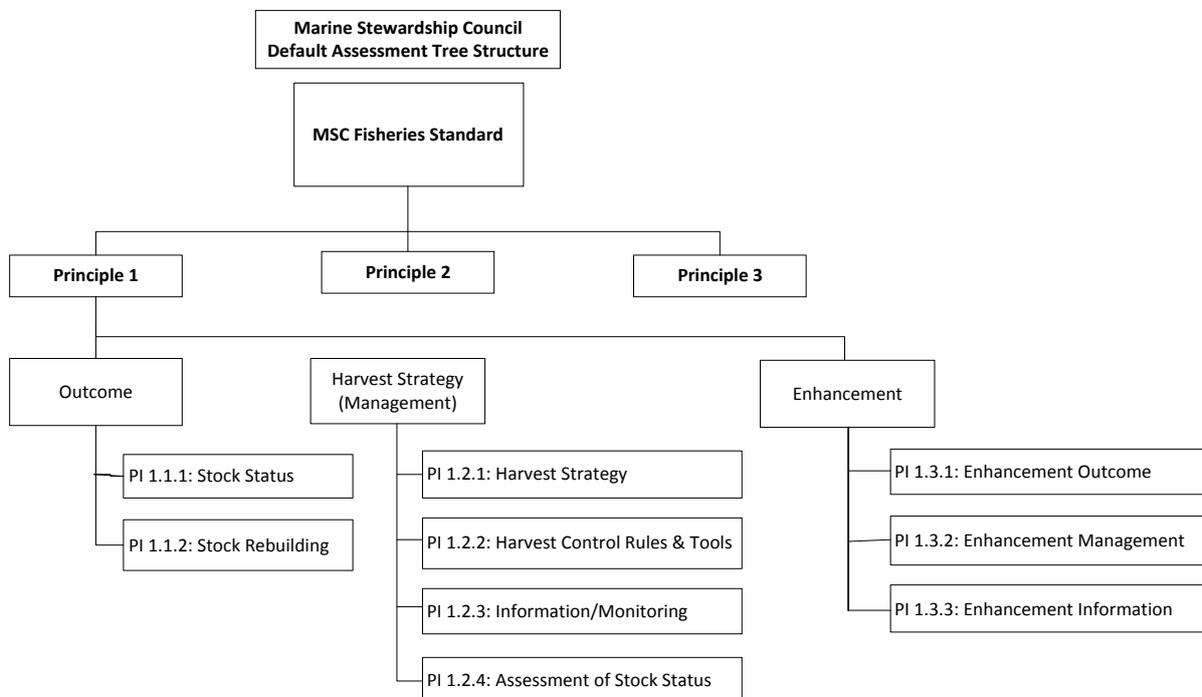
Table SC1: Terms and Definitions

Term	Definition
Artificial Production	The artificial propagation of fish that are released into the natural environment. Artificial production is commonly used to increase the number of fish available to be caught or to rebuild depleted populations. It includes hatchery operations.
Artificially produced fish	Those fish whose parents spawned in a hatchery or artificial habitat as described above.
Diversity (of salmon)	The genetic variation and adaptations to different environments that have accumulated between populations of salmon.
Enhancement	Artificial intervention in the natural life cycle of salmon. This may include artificial production as defined above or other measures such as spawning channels, and lake fertilization.
Population	A component of an SMU. Population refers to the wild production components which may occupy different locations at different times. A population could be a group of interbreeding salmon that is relatively isolated (i.e., relatively demographically uncoupled from other such groups and is likely adapted to the local habitat).
Production (of salmon)	Recruits per spawner x total spawners. i.e., total production of the population.

Term	Definition
Productivity (of salmon)	The number of recruits per spawner. The term productivity is used in Annex SA to mean productivity at the stock, not individual level. Assessment teams should consider this when assessing salmon fisheries.
Productivity (related to the ecological community or the ecosystem)	The rate of biomass production per unit area per time.
Stock Management Unit (SMU)	A group of one or more salmon populations. Generally, fishery management goals have been established by the management agency at this aggregate level. SMU is a broad management concept; not every population with a defined goal need be an individual SMU, but may be part of an SMU. For salmon fishery assessments 'stock' in Annex SA of MSC's Certification Requirements refers to the SMU level.
Wild fish	Fish whose parents spawned in the wild, regardless of parental lineage (F1 generation); also referred to as natural-origin fish.

SC2 Principle 1

Figure SC1: Principle 1 Modified Default Tree Structure for salmon fisheries



SC2.1 General requirements for Principle 1

- SC2.1.1 The team shall consider the unique population structure of salmon in its assessment of Principle 1. !!
- SC2.1.2 For salmon assessments Stock Management Units (SMUs) shall be regarded as equivalent to single stocks in other contexts.
- SC2.1.3 Where Annex SA default requirements apply, it is specifically noted in that section for Principle 1.

SC2.2 Stock status PI (PI 1.1.1)

Table SC2: PI 1.1.1 Stock status PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Outcome	Stock status 1.1.1 The stock management unit (SMU) is at a level which maintains high production and has a low probability of falling below its limit reference point (LRP).	(a) Stock status	It is likely that the SMU is above the limit reference point (LRP).	It is highly likely that the SMU is above the LRP.	There is a high degree of certainty that the SMU is above the LRP.
		(b) Stock status in relation to the target reference point (TRP) e.g., target escapement goal or target harvest rate)		The SMU is at or fluctuating around its TRP.	There is a high degree of certainty that the SMU has been fluctuating around its TRP, or has been above its target reference point, over recent years.
		(c) Status of component populations			The majority of component populations in the SMU are within the range of expected variability.

Scoring stock status !!

- SC2.2.1 In scoring PI 1.1.1 for salmon fisheries the level of the limit and target reference points shall be consistent with the intent in SA PI 1.1.1 for the outcome PIs. ■
 - SC2.2.1.1 The limit reference point (LRP) shall be a level at which the SMU has a high probability of persistence in the presence of directed fishing and of recovery to high production in the absence of directed fishing.

- SC2.2.1.2 The target reference point (TRP, generally expressed as a target escapement goal or target harvest rate), shall be a level at which the SMU maintains high production (such as BEGs or S_{MSY}).
- SC2.2.2 In an enhanced fishery, the team shall assess status based solely on the wild salmon in the SMU. 
- SC2.2.2.1 Artificially-produced fish shall not be counted toward meeting spawning escapement goals, or other surrogate reference points. 
- SC2.2.2.2 Where no distinction is made between wild fish and artificially produced fish in estimates of spawning escapements or other surrogate reference points, stock status shall be scored lower than in cases where wild fish are enumerated separately. 
- SC2.2.3 In scoring PI 1.1.1 for salmon and reflecting the periodic recruitment patterns of these species the assessment team shall consider the following: **!!**
- SC2.2.3.1 Stock status: Taking into consideration the specific dynamics of salmon stocks, a fishery shall meet the SG60 requirement in PI 1.1.1 scoring issue (a) if the average SMU spawning stock size is above the limit reference point (LRP). The terms “likely”, “highly likely” and “high degree of certainty” are used to allow for qualitative and quantitative evaluation. Where time series data are available:
- a. “Likely” shall be interpreted to mean at $\geq 60\%$ of the 15 most recent years, i.e., 9 of the 15 years.
 - b. “Highly likely” shall be interpreted to mean $\geq 80\%$ of the 15 most recent years, i.e., 12 of the 15 years.
 - c. “High degree of certainty” shall be interpreted to mean $> 90\%$ of the 15 most recent years.
- SC2.2.3.2 Stock status in relation to Target Reference Points: In scoring issue (b) of PI 1.1.1, where time series data are available:
- a. “Fluctuating around” at the SG80 level means an SMU meeting its target reference point in $\geq 50\%$ of the 15 most recent years.
 - b. A “high degree of certainty” at the SG100 level shall be interpreted to mean that the SMU has met its target reference point $\geq 80\%$ of the last 15 years.
- SC2.2.3.3 Status of component populations: Scoring issue (c), ‘majority of component populations in the SMU’ allows for qualitative and/or quantitative analysis. Where population specific reference points are neither defined, nor individual populations monitored, assessment teams may make a reasoned argument based on expert judgement and qualitative information to score this scoring issue. Fishing should allow for the persistence of component populations, recognizing that at any point in time there is likely to be some populations at low and high productivity in the absence of fishing.
- SC2.2.4 [SA2.2.2](#) – [SA2.2.7](#) shall also apply.

SC2.3 Stock rebuilding PI (PI 1.1.2) !!

Table SC3: PI 1.1.2 Stock rebuilding PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Outcome	Stock Rebuilding 1.1.2 Where the stock management unit (SMU) is reduced, there is evidence of stock rebuilding within a specified timeframe.	(a) Rebuilding timeframes	A rebuilding timeframe is specified for the SMU 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 SMU.
		(b) Rebuilding evaluation	Monitoring is in place to determine whether the fishery – based rebuilding strategies are effective in rebuilding the SMU within the specified timeframe.	There is evidence that the fishery-based rebuilding strategies are being implemented effectively, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the SMU within the specified timeframe .	There is strong evidence that the rebuilding strategies are being implemented effectively, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the SMU within the specified timeframe .
		(c) Use of enhancement in stock rebuilding !!	Enhancement activities are not routinely used as a stock rebuilding strategy but may be temporarily in place as a conservation measure to preserve or	Enhancement activities are very seldom used as a stock rebuilding strategy.	Enhancement activities are not used as a stock rebuilding strategy.

Component	PI	Scoring issues	SG60	SG80	SG100
			restore wild diversity threatened by human or natural impacts.		

- SC2.3.1 Teams shall only score this PI when stock status does not meet the SG80 level in PI 1.1.1 due to low stock levels, such that the SMU needs rebuilding. !!
- SC2.3.2 The team shall assess and verify that no fisheries are targeting or otherwise excessively harvesting populations that are below biologically based limits during the SMU rebuilding period. !!
- SC2.3.3 In scoring issue (c):
- a. 'Routinely' shall be interpreted as built into a long-term management strategy or utilized in lieu of wild salmon population management;
 - b. 'Very seldom' shall be interpreted as used only for short term emergency cases, and not forming part of a long term management or rebuilding strategy.
- SC2.3.4 Annex [SA2.3.2–SA2.3.5](#) shall also apply.

SC2.4 Harvest strategy PI (PI 1.2.1) 

Table SC4: PI 1.2.1 Harvest strategy PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Harvest strategy (management)	Harvest strategy 1.2.1 There is a robust and precautionary harvest strategy in place.	(a) Harvest strategy design	The harvest strategy is expected to achieve SMU management objectives reflected in PI 1.1.1 SG80 including measures that address component population status issues.	The harvest strategy is responsive to the state of the SMU and the elements of the harvest strategy work together towards achieving SMU management objectives reflected in PI 1.1.1 SG80 including measures that address component population status issues.	The harvest strategy is responsive to the state of the SMU and is designed to achieve SMU management objectives reflected in PI 1.1.1 SG80 including measures that address component population status issues.
		(b) Harvest strategy evaluation	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 SMUs at target levels.
		(c) Harvest strategy monitoring	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
		(d) Harvest strategy review			The harvest strategy is periodically reviewed and improved as necessary.

Component	PI	Scoring issues	SG60	SG80	SG100
		(e) Shark finning	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
		(f) Review of alternative measures	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.

- SC2.4.1 In scoring issue (a), the assessment team shall evaluate whether fishery managers attempt to minimize harvest of any weak component population(s) within the SMU through differential harvest (e.g., managers alter time, location and effort of the fishery). 
- SC2.4.2 In scoring issue (a), assessment teams shall consider whether the harvest strategy of a salmon fishery with artificial production is designed to control exploitation rates on wild stocks in order to allow for self-sustaining, locally adapted wild populations. 
- SC2.4.3 Annex [SA2.4.1–SA2.4.8](#) shall also apply.

SC2.5 Harvest control rules and tools PI (PI 1.2.2) !!

Table SC5: PI 1.2.2 Harvest control rules and tools PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Harvest strategy	Harvest control rules and tools 1.2.2 There are well defined and effective harvest control rules (HCRs) in place.	(a) HCRs design and application	Generally understood HCRs are in place or available which are expected to reduce the exploitation rate as the SMU LRP is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the LRP is approached, and are expected to keep the SMU fluctuating around a target level consistent with MSY.	The HCRs are expected to keep the SMU 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.
		(b) HCRs robustness to uncertainty		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 SMU, and there is evidence that the HCRs are robust to the main uncertainties.
		(c) HCRs evaluation	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.
		(d) Maintenance of wild component populations	It is likely that the HCRs and tools are consistent with maintaining the diversity and productivity of the wild	It is highly likely , that the HCRs and tools are consistent with maintaining the diversity and productivity of the wild	There is a high degree of certainty that the HCRs and tools are consistent with maintaining the diversity and productivity of the wild component populations.

Component	PI	Scoring issues	SG60	SG80	SG100
			component populations.	component populations.	

SC2.5.1 In scoring issue (a), the team shall consider whether the HCRs and tools are capable of maintaining the SMU at an abundance consistent with high production.

SC2.5.2 In scoring issue (d) the team shall consider empirical and/or analytical evidence (such as field evidence and/or simulations of multiple population complexes) that supports the likelihood that the established set of HCRs and tools will result in the abundance and spatial/temporal distribution of component populations consistent with maintaining their diversity and productivity. !!

SC2.5.3 Annex [SA2.5.2–SA2.5.7](#) shall also apply.

SC2.6 Information and monitoring PI (PI 1.2.3) !!

Table SC6: PI 1.2.3 information and monitoring PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Harvest strategy	Information / monitoring 1.2.3 Relevant information is collected to support the harvest strategy.	(a) Range of information	Some relevant information related to SMU structure, SMU production and fleet composition is available to support the harvest strategy. Indirect or direct information is available on some component populations.	Sufficient relevant information related to SMU structure, SMU production, fleet composition and other data are available to support the harvest strategy, including harvests and spawning escapements for a representative range of wild component populations.	A comprehensive range of information (on SMU structure, SMU production, fleet composition, SMU abundance, UoA removals and other information such as environmental information), including some that may not be relevant to the current harvest strategy, is available, including estimates of the impacts of fishery harvests on the SMU and the majority of wild component populations.
		(b) Monitoring	SMU wild abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	SMU wild 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.

Component	PI	Scoring issues	SG60	SG80	SG100
		(c) Comprehensiveness of information		There is good information on all other fishery removals from the SMU .	

SC2.6.1 For scoring issue (a), at SG80 level 'sufficient relevant information' should include direct evidence and/or analysis and risk assessments. 

SC2.6.2 Annex [SA2.6.1–SA2.6.4](#) shall also be applied.

SC2.7 Assessment of stock status PI (PI 1.2.4) !!

Table SC7: PI 1.2.4 Assessment of stock status PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Harvest strategy	<p>Assessment of stock status</p> <p>1.2.4</p> <p>There is an adequate assessment of the stock status of the SMU.</p>	(a) Appropriateness of assessment to stock under consideration		The assessment is appropriate for the SMU 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.
		(b) Assessment approach ■	The assessment estimates stock status relative to generic reference points appropriate to salmon.	The assessment estimates stock status relative to reference points that are appropriate to the SMU and can be estimated.	The assessment estimates with a high level of confidence both stock status and reference points that are appropriate to the SMU and its wild component populations.
		(c) Uncertainty in the assessment	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.
		(d) Evaluation of assessment			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
		(e) Peer review of assessment		The assessment of SMU status, including the choice of indicator populations and methods for evaluating wild salmon in enhanced fisheries is subject to peer review.	The assessment, including design for using indicator populations and methods for evaluating wild salmon in enhanced fisheries has been internally and externally peer reviewed.

Component	PI	Scoring issues	SG60	SG80	SG100
		(f) Representativeness of indicator stocks	Where indicator stocks are used as the primary source of information for making management decisions on SMUs, there is some scientific basis for the indicators selection.	Where indicator stocks are used as the primary source of information for making management decisions on SMUs, there is some evidence of coherence between the status of the indicator streams and the status of the other populations they represent within the management unit, including selection of indicator stocks with low productivity (i.e., those with a higher conservation risk) to match those of the representative SMU where applicable.	Where indicator stocks are used as the primary source of information for making management decisions on SMUs, the status of the indicator streams are well correlated with other populations they represent within the management unit, including stocks with lower productivity (i.e., those with a higher conservation risk).
		(g) Definition of Stock Management Units (SMUs) ■	The majority of SMUs are defined with a clear rationale for conservation, fishery management and stock assessment requirements.	The SMUs are well-defined and include definitions of the major populations with a clear rationale for conservation, fishery management and stock assessment requirements.	There is an unambiguous description of each SMU that may include the geographic location, run timing, migration patterns, and/or genetics of component populations with a clear rationale for conservation, fishery management and stock assessment requirements.

SC2.7.1 In scoring issue (b), the team shall assess whether reference points will maintain the spawner abundance consistent with MSY (S_{MSY}) or similarly abundant levels. !!

SC2.7.1.1 In enhanced salmon fisheries, the team shall consider whether the reference points are based only on wild fish. !!

SC2.7.2 In scoring PI 1.2.4 (f), indicator populations, the assessment team shall evaluate factors such as number, spatial distribution, and migration timing of the indicator stocks relative to the stock management unit. !!

SC2.7.3 In scoring PI 1.2.4 (g), the definition of SMUs shall reflect an understanding of the population structure, including information on the component populations. !!

SC2.7.3.1 The team shall assess whether wild and artificially influenced components are clearly distinguished in defining SMUs. !!

SC2.8 General requirements for enhancement PIs

SC2.8.1 All salmon fisheries shall be scored against the enhancement PIs.

SC2.8.1.1 Where there are no enhancement activities associated with the UoA, the default score for these enhancement PIs should be 100.

SC2.8.2 The team shall interpret key words or phrases used in the enhancement PIs in Annex SC as shown in [Table SC8](#).

Table SC8: Enhancement Terms and Definitions

Term	Definition
Habitat enhancement	Any modification to habitat that raises the production (with the intent of increasing fishery production) beyond the normative processes of the habitat should be considered artificial production. [Habitat modification intended to return habitat to its normative state may be considered restoration, and need not be considered under the enhancement PIs]
Hatchery enhancement	Hatchery operations, seeding of a lake with fish released after being raised in a hatchery etc.
'Integrated' hatchery production	Where a hatchery population is associated with a wild population and the hatchery program is managed (intentionally or in practice) in such a way that gene flow from the wild to the hatchery population is non-negligible.
pHOS	The proportion of H atchery- O origin fish contributing to the natural S pawning population. For the purpose of assessment the simple 4-yr arithmetic mean should be used.
pNOB	The proportion of N atural- O origin (wild) fish contributing to the hatchery B roodstock. For the purpose of assessment the simple 4-yr arithmetic mean should be used.
'Segregated' hatchery production	Where hatchery populations are maintained as isolated reproductive groups and hatchery fish do not stray into and spawn with wild populations, or only to a very limited extent.
Stray rate	The proportion of fish that do not home accurately and return to some other location.

SC2.9 Enhancement outcomes PI (PI 1.3.1) !!

Table SC9: PI 1.3.1 Enhancement outcomes PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery enhancement	<p>Enhancement outcomes</p> <p>1.3.1</p> <p>Enhancement activities do not negatively impact the wild stock(s)</p>	(a) Enhancement impacts ☑	It is likely that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance or productivity and diversity of wild stocks.	It is highly likely that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance or productivity and diversity of wild stocks.	There is a high degree of certainty that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance or productivity and diversity of wild stocks.

SC2.9.1 The method used by the assessment team to score this PI shall depend on the level of available information.

- SC2.9.1.1 Where relevant studies on enhancement outcomes are available, assessment teams shall use them to score this PI. ☑
- SC2.9.1.2 Where no relevant studies on enhancement outcomes are available, but pHOS and pNOB values are estimated, these shall be used to score this PI in relation to default values appropriate to the species and type of enhancement. ☑
- SC2.9.1.3 Where neither relevant studies nor estimates of pHOS nor pNOB exist, the assessment team shall use expert judgement to score this PI using a precautionary approach. !!

SC2.10 Enhancement management PI (PI 1.3.2) !!

Table SC10: PI 1.3.2 Enhancement management PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery enhancement	Enhancement Management 1.3.2 Effective enhancement and fishery strategies are in place to address effects of enhancement activities on wild stock(s).	(a) Management strategy in place ☐	Practices and protocols are in place to protect wild stocks from significant negative impacts of enhancement.	There is a partial strategy in place to protect wild stocks from significant negative impacts of enhancement.	There is a comprehensive strategy in place to protect wild stocks from significant negative impacts of enhancement.
		(b) Management strategy evaluation	The practices and protocols in place are considered likely to be effective based on plausible argument.	There is some objective basis for confidence that the strategy is effective, based on evidence that the strategy is achieving the outcome metrics used to define the minimum detrimental impacts.	There is clear evidence that the comprehensive strategy is successfully protecting wild stocks from significant detrimental impacts of enhancement.

SC2.10.1 The team shall assess whether management seeks to minimize the number and proportion of hatchery fish interbreeding with wild fish in natural spawning areas.



SC2.11 Enhancement information PI (PI 1.3.3) 

Table SC11: PI 1.3.3 Enhancement information PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery enhancement	Enhancement Information 1.3.3 Relevant information is collected and assessments are adequate to determine the effect of enhancement activities on wild stock(s).	(a) Information adequacy 	Some relevant information is available on the contribution of enhanced fish to the fishery harvest, total escapement (wild plus enhanced), and hatchery broodstock.	Sufficient relevant qualitative and quantitative information is available on the contribution of enhanced fish to the fishery harvest, total escapement (wild plus enhanced) and hatchery broodstock.	A comprehensive range of relevant quantitative information is available on the contribution of enhanced fish to the fishery harvest, total escapement (wild plus enhanced) and hatchery broodstock.
		(b) Use of information in assessment	The effect of enhancement activities on wild stock status, productivity and diversity are taken into account qualitatively.	A moderate-level analysis of relevant information is conducted and used by decision makers to quantitatively estimate the impact of enhancement activities on wild-stock status, productivity, and diversity.	A comprehensive analysis of relevant information is conducted and routinely used by decision makers to determine, with a high degree of certainty, the quantitative impact of enhancement activities on wild-stock status, productivity, and diversity.

SC2.11.1 In scoring issue (a), 'information' shall include the marking and monitoring of artificially produced fish. 

SC2.11.1.1 The assessment team shall consider the methods of artificial production in their assessment. 

SC3 Principle 2

SC3.1 General requirements for Principle 2

SC3.1.1 Only additions and modifications are included herein, in Principle 2 all default Annex SA requirements apply. !!

SC3.1.2 All salmon fisheries shall score all elements of all PIs, whether or not there are enhancement activities. !!

SC3.2–3.9 No modifications to Annex SA

SC3.10 ETP species outcome PI (PI 2.3.1)

Table SC12: PI 2.3.1 ETP species outcome PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
ETP species	<p>Outcome Status</p> <p>2.3.1</p> <p>The UoA meets national and international requirements for protection of ETP species.</p> <p>The UoA and associated enhancement activities do not hinder recovery of ETP species.</p>	(a) Effects of the UoA on population/stocks within national or international limits, where applicable	Where national and/or international requirements set limits for ETP species, the effects of the UoA and associated enhancement activities on the population/stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs and associated enhancement activities on the population/stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs and associated enhancement activities are within these limits.
		(b) Direct effects	Known direct effects of the UoA including enhancement activities are likely to not hinder recovery of ETP species.	Direct effects of the UoA including enhancement activities are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA including enhancement activities on ETP species.
		(c) Indirect effects		Indirect effects have been considered for the UoA including enhancement activities and are thought to be highly unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA including enhancement activities on ETP species.

SC3.11 ETP species management strategy PI (PI 2.3.2)

Table SC13: PI 2.3.2 ETP species management strategy PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
ETP species	<p>Management strategy</p> <p>2.3.2</p> <p>The UoA and associated enhancement activities have in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> - meet national and international requirements and - ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures as appropriate to minimise mortality of ETP species.</p>	(a) Management strategy in place (national and international requirements)	There are measures in place that minimise the UoA related mortality of ETP species due to the UoA including enhancement activities, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA and enhancement activities' impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA and enhancement activities' impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
		(b) Management strategy in place (alternative)	There are measures in place that are expected to ensure the UoA including enhancement activities do not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA including enhancement activities do not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA including enhancement activities do not hinder the recovery of ETP species.
		(c) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoA/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the UoA and/or the species involved.	The strategy/ comprehensive strategy is mainly based on information directly about the UoA and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.

Component	PI	Scoring issues	SG60	SG80	SG100
		(d) Management strategy implementation		There is some evidence that the measures/strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b) .
		(e) Review of alternative measures to minimise mortality of ETP species	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA and enhancement related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA and enhancement related mortality of ETP species, and they are implemented, as appropriate.

SC3.12 ETP Species information PI (PI 2.3.3)

Table SC14: PI 2.3.3 ETP species information PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
ETP species	<p>Information / monitoring</p> <p>2.3.3</p> <p>Relevant information is collected to support the management of the UoA and enhancement activities impacts on ETP species, including:</p> <ul style="list-style-type: none"> - information for the development of the management strategy; - information to assess the effectiveness of the management strategy; and - information to determine the outcome status of ETP species. 	(a) Information adequacy for assessment of impacts	<p>Qualitative information is adequate to estimate the UoA and associated enhancement related mortality on ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA:</p> <p>Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.</p>	<p>Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA and associated enhancement may be a threat to protection and recovery of the ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA:</p> <p>Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.</p>	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA and associated enhancement related impacts, mortalities and injuries and the consequences for the status of ETP species.

Component	PI	Scoring issues	SG60	SG80	SG100
		(b) Information adequacy for management strategy	Information is adequate to support measures to manage the impacts on ETP species	Information is adequate to measure trends and support a strategy to manage impacts on ETP species	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.

SC3.13 Habitats outcome PI (PI 2.4.1)

Table SC15: PI 2.4.1 Habitats outcome PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Habitats	<p>Outcome Status</p> <p>2.4.1</p> <p>The UoA and its associated enhancement activities do not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.</p>	(a) Commonly encountered habitat status	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
		(b) VME habitat status	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
		(c) Minor habitat status			There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.

Component	PI	Scoring issues	SG60	SG80	SG100
		(d) Impacts due to enhancement activities within the UoA !!	The enhancement activities are unlikely to have adverse impacts on habitat.	The enhancement activities are highly unlikely to have adverse impacts on habitat.	There is a high degree of certainty that the enhancement activities do not have adverse impacts on habitat.

SC3.13.1 In this PI, assessment teams shall interpret 'habitat' to include, but not be limited to:

- a. Water quality,
- b. Access of wild fish to spawning habitat, and
- c. Quality of stream habitat (such as physical features, spawning and rearing flows and water temperatures).

SC3.13.2 The impacts of enhancement-related habitat modifications shall be assessed to the standard that they have minimal adverse impacts on the surrounding habitats (i.e., impacts resulting from the physical operation of the culture facility and not evaluated necessarily in the context of some broader regional resource consequence). !!

SC3.14 Habitats management strategy PI (PI 2.4.2) !!

Table SC16: PI 2.4.2 Habitats management strategy PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Habitats	<p>Management strategy</p> <p>2.4.2</p> <p>There is a strategy in place that is designed to ensure the UoA and associated enhancement activities do not pose a risk of serious or irreversible harm to the habitats.</p>	(a) Management strategy in place	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries UoA and associated enhancement activities on habitats.
		(b) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoA/enhancement activities/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA, enhancement activities and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA, enhancement activities, and/or habitats involved.
		(c) Management strategy implementation		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
		(d) Compliance with management requirements and other MSC UoAs'/non-MSC	There is qualitative evidence that the UoA complies with its management requirements	There is some quantitative evidence that the UoA and associated enhancement activities comply with both its	There is clear quantitative evidence that the UoA and associated enhancement activities comply with both its

Component	PI	Scoring issues	SG60	SG80	SG100
		fisheries' measures to protect VMEs	to protect VMEs.	management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.

SC3.14.1 Assessment teams shall consider whether management strategies for enhancement activities are in place to reduce impact on water quality, access of natural origin fish to spawning habitat, and quality of stream habitat (such as physical features, spawning and rearing flows and water temperatures). !!

SC3.15 Habitats information PI (PI 2.4.3)

Table SC17: PI 2.4.3 Habitats information PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Habitats	Information / monitoring 2.4.3 Information is adequate to determine the risk posed to the habitat by the UoA and associated enhancement activities and the effectiveness of the strategy to manage impacts on the habitat.	(a) Information quality	The types and distribution of the main habitats are broadly understood . OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
		(b) Information adequacy for assessment of impacts	Information is adequate to broadly understand the nature of the main impacts of gear use and enhancement activities used on the main habitats, including spatial overlap of habitat with fishing gear. OR If CSA is used to score	Information is adequate to allow for identification of the main impacts of the UoA and enhancement activities on the main habitats and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.	The physical impacts of the gear and enhancement activities on all habitats have been quantified fully.

Component	PI	Scoring issues	SG60	SG80	SG100
			<p>PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.</p>	<p>OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.</p>	
		(c) Monitoring		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.

SC3.15.1 Teams shall consider whether information on enhancement facilities and activities are collected to support the outcome in PI 2.4.1. 

SC3.15.2 In meeting SG 60 the team should verify that any information legally required by operating permits relevant to these habitat issues is being collected.

SC3.16 Ecosystem outcome PI (PI 2.5.1)

Table SC18: PI 2.5.1 Ecosystem outcome PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Ecosystem	Outcome Status 2.5.1 The UoA and associated enhancement activities do not cause serious or irreversible harm to the key elements of ecosystem structure and function.	(a) Ecosystem status	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
		(b) Impacts due to enhancement 	Enhancement activities are unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	Enhancement activities are highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the enhancement activities are highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.

SC3.16.1 In scoring issue (b), assessments teams shall consider ‘key elements underlying ecosystem structure and function’ to include the ecological productivity and abundance of wild salmon and other components of the aquatic ecosystem as a result of predation, competition for resources, and disease transmission. **!!**

SC3.16.2 The team should organize its assessment of ecological interaction risks from enhancement programs into the following two categories: disease transmission and predation/competition. **!!**

SC3.17 Ecosystem management PI (PI 2.5.2) !!

Table SC19: PI 2.5.2 Ecosystem management PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Ecosystem	Management strategy 2.5.2 There are measures in place to ensure the UoA and enhancement activities do not pose a risk of serious or irreversible harm to ecosystem structure and function.	(a) Management strategy in place	There are measures in place, if necessary which take into account the potential impacts of the UoA on key elements of the ecosystem.	There is a partial strategy in place, if necessary which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan in place, which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
		(b) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoA/ ecosystems).	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
		(c) Management strategy implementation		There is some evidence that the measures/ partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .

Component	PI	Scoring issues	SG60	SG80	SG100
		(d) Management of enhancement activities !!	There is an established artificial production strategy in place that is expected to achieve the Ecosystem Outcome 60 level of performance.	There is a tested and evaluated artificial production strategy with sufficient monitoring in place and evidence is available to reasonably ensure with high likelihood that the strategy is effective in achieving the Ecosystem Outcome 80 level of performance.	There is a comprehensive and fully evaluated artificial production strategy to verify with certainty that the Ecosystem Outcome 100 level of performance.

SC3.17.1 In scoring issue (d), assessment teams shall consider whether management measures are in place that decrease ecological risk of enhancement activities, in particular management of disease and competition/predation. !!

SC3.18 Ecosystem information PI (PI 2.5.3)

Table SC20: PI 2.5.3 Ecosystem information PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Ecosystem	Information / monitoring 2.5.3 There is adequate knowledge of the impacts of the UoA and associated enhancement activities on the ecosystem.	(a) Information quality	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
		(b) Investigation of the UoA impacts	Main impacts of the UoA and associated enhancement activities on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA and associated enhancement activities on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.	Main interactions between the UoA and associated enhancement activities and these ecosystem elements can be inferred from existing information, and have been investigated in detail.
		(c) Understanding of component functions		The main functions of the components (i.e., P1 target species, primary, secondary, and ETP species and Habitats) in the ecosystem are known.	The impacts of the UoA and associated enhancement activities on P1 target, primary, secondary, and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood.
		(d) Information relevance		Adequate information is available on the impacts of the UoA and associated enhancement activities on these components to allow some of the main consequences	Adequate information is available on the impacts of the UoA and associated enhancement activities on the components and elements to allow the main consequences for

Component	PI	Scoring issues	SG60	SG80	SG100
				for the ecosystem to be inferred.	the ecosystem to be inferred.
		(e) Monitoring		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.

SC3.18.1 The team shall assess whether relevant information is collected to understand the impacts of enhancement activities on the receiving ecosystem. 

SC4 Principle 3

SC4.1 General requirements for Principle 3

- SC4.1.1 Only additions and modifications are included herein, in Principle 3 all default Annex SA requirements apply. 🟩
- SC4.1.2 The assessment team shall explicitly consider enhancement activities that are associated with the fishery. 🟩

SC4.2–4.3 No modifications to Annex SA

SC4.4 Consultation, roles and responsibilities PI (PI 3.1.2)

- SC4.4.1 In scoring this PI, assessment teams shall consider whether the consultation process covers both the fishery and enhancement activities. !!
- SC4.4.2 No modifications to [Table SA26](#).

SC4.5 Long term objectives PI (PI 3.1.3)

Table SC21: PI 3.1.3 Long term objective PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Governance and policy	<p>Long term objectives</p> <p>3.1.3</p> <p>The management policy for the SMU and associated enhancement activities has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach.</p>	(a) Objectives	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

SC4.5.1 The team shall assess whether the fishery’s enhancement activities have explicit long-term objectives and a guiding policy context that is consistent with managing for sustainable Principle 1 and Principle 2 outcomes for wild salmon, and that shapes short-term objectives and decision making processes. 

SC4.6 Fishery-specific management system PIs

SC4.6.1 No modifications to SA4.6.

SC4.7 Fishery-specific objectives PI (PI 3.2.1)

Table SC22: PI 3.2.1 Fishery specific objectives PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery-specific management system	<p>Fishery- specific objectives</p> <p>3.2.1</p> <p>The fishery-specific and associated enhancement management system(s) have clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.</p>	(a) Objectives	<p>Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery and associated enhancement management system(s).</p>	<p>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 and associated enhancement management system(s).</p>	<p>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 and associated enhancement management system(s).</p>

SC4.7.1 The team shall evaluate whether **clear objectives** exist for the fishery's enhancement activities that are consistent with achieving specific, related outcomes in Principles 1 and 2. 

SC4.8 Decision-making processes PI (PI 3.2.2)

Table SC23: PI 3.2.2 Decision making processes PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery-specific management system	<p>Decision-making processes</p> <p>3.2.2</p> <p>The fishery-specific and associated enhancement 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.</p>	(a) Decision-making processes	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific and enhancement objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific and enhancement objectives.	
		(b) Responsiveness of decision-making processes	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.
		(c) Use of precautionary approach		Decision-making processes use the precautionary approach and are based on best available information.	

Component	PI	Scoring issues	SG60	SG80	SG100
		(d) Accountability and transparency of management system and decision making process	Some information on performance and management action is generally available on request to stakeholders	Information on fishery performance and management action is available on request , and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
		(e) Approach to disputes	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.

SC4.8.1 The team shall assess whether the decision making processes surrounding enhancement activities, including determination of production levels and strategies, result in measures and strategies that are consistent with meeting specific objectives for ensuring Principles 1 and 2 outcomes. !!

SC4.9 Compliance and enforcement PI (PI 3.2.3)

Table SC24: PI 3.2.3 Compliance and enforcement PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery-specific management system	<p>Compliance and enforcement</p> <p>3.2.3</p> <p>Monitoring, control and surveillance mechanisms ensure the management measures in the fishery and associated enhancement activities are enforced and complied with.</p>	(a) MCS implementation	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and associated enhancement activities and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and associated enhancement activities 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 associated enhancement activities and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
		(b) Sanctions	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.
		(c) Compliance	Fishers and hatchery operators are generally thought to comply with the management system for the fishery and associated enhancement activities under assessment, including, when required, providing information of importance to	Some evidence exists to demonstrate fishers and hatchery operators comply with the management system under assessment, including, when required, providing information of importance to the effective management	There is a high degree of confidence that fishers and hatchery operators comply with the management system under assessment, including, providing information of importance to the effective management of the fishery and associated

Component	PI	Scoring issues	SG60	SG80	SG100
			the effective management of the fishery.	of the fishery and associated enhancement activities.	enhancement activities.
		(d) Systematic non-compliance		There is no evidence of systematic non-compliance.	

SC4.9.1 The team shall consider whether private hatchery operators cooperate with management authorities in collection and sharing of information important to ensure that artificial production activities are complying with legal and management system objectives and requirements.

SC4.10 Monitoring and management performance evaluation PI (PI 3.2.4)

Table SC25: PI 3.2.4 Monitoring and management performance evaluation PISGs

Component	PI	Scoring issues	SG60	SG80	SG100
Fishery-specific management system	Monitoring and management performance evaluation 3.2.4 There is a system for monitoring and evaluating the performance of the fishery-specific and enhancement management system(s) against its objectives. There is effective and timely review of the fishery-specific and associated enhancement program(s) management system.	(a) Evaluation coverage	The fishery and associated enhancement program(s) has in place mechanisms to evaluate some parts of the management system.	The fishery and associated enhancement program(s) has in place mechanisms to evaluate key parts of the management system.	The fishery and associated enhancement program(s) has in place mechanisms to evaluate all parts of the management system.
		(b) Internal and/or external review !!	The fishery-specific and associated enhancement program(s) management system is subject to occasional internal review.	The fishery-specific and associated enhancement program(s) management system is subject to regular internal and occasional external review.	The fishery-specific and associated enhancement program(s) management system is subject to regular internal and external review.

SC4.10.1 The team shall evaluate whether hatchery operational plans include well-designed and supported provisions for monitoring the fishery's enhancement activities that are consistent with achieving specific, related outcomes and objectives in Principles 1 and 2, with particular attention to evaluating the impacts of enhancement activities on natural production components and ecosystem function.

SC5 Weighting to be Applied in Enhanced Salmon Fisheries

- SC5.1 The team shall use the revised weighting contained in [Scoring Worksheet for Salmon Fisheries](#), when scoring salmon fisheries.

SC6 Allowances for Inseparable or Practicably Inseparable (IPI) Catches in Salmon Fisheries

SC6.1 IPI catches in salmon fisheries

- SC6.1.1 In considering whether there are catches of non-target salmon stock(s) that are to be treated as 'inseparable or practicably inseparable' (IPI) from target salmon stock(s), under FCR 7.4.13, CABs shall note in the case of salmon fisheries that stocks shall only be considered IPI if they are not certified separately and are either: ■
- a. Non-target species (scored in P2, not P1); or
 - b. Non-local stocks of species targeted in the fishery (i.e., stocks that are caught in the fishery but do not breed within the UoA and are not therefore normally scored as part of the SMU).
- SC6.1.1.1 Where the proposed IPI stock is a different salmon species to the target species ([SC6.1.1.a](#)), it shall: ■
- a. Only be considered not commercially feasible to separate the species when the total catches from the IPI stock(s) do not exceed 5% by weight of the total combined catches of target and IPI stock(s) within the unit of assessment; and
 - b. Be assessed under P2 in accordance with the requirements in Annex PA2.1.1.
- SC6.1.1.2 Where the proposed IPI stocks are non-local stocks of the same species as the P1 target stock within the UoA ([SC6.1.1.b](#)): !!
- a. The total catches from the IPI stock(s) shall not exceed 5% by weight of the total combined catches of target and IPI stock(s) within the UoA; and
 - b. FCR 7.4.13.1.d shall not apply to these stocks, but, if outside biologically based limits, the team shall demonstrate that the fishery
 - i. Does not catch a significant proportion of the total catch of the stock; and
 - ii. Is highly likely not to significantly hinder its recovery, and practical measures have been implemented to reduce impacts on the stock.
- SC6.1.2 In considering whether candidate IPI stocks meet the defined 5% upper catch limits (under [SC6.1.1.1](#) and [SC6.1.1.2](#) above), CABs shall take into account catch data from the most recent two or more years prior to the date on which the

eligibility is decided, as necessary to allow for the normal age at spawning of each of the species under consideration. ❗

- SC6.1.3 If IPI stocks are identified and are below the level of 5% specified in [SC6.1.1.1.a](#) and [SC6.1.1.2.a](#), the CAB shall, as early as practicable in the assessment process, submit a variation request to the MSC to allow fish or fish products to be considered as coming from IPI stocks to enter further into chains of custody. 🟩

End of Annex SC

Annex SD: Introduced Species Based Fisheries (ISBF) – Normative

SD1 General

- SD1.1.1 If the fishery is based upon an introduced species, the CAB shall apply Annex SD.
- SD1.1.2 CABs shall note that the requirements for ISBF are a pilot program and Annex SD may be subject to change.

SD2 Initial Requirements on Assessment Issues

- SD2.1.1 The CAB shall consider the ecological role of the introduced species.
 - SD2.1.1.1 The CAB shall assess the ISBF against default PISGs in Principle 1.
 - SD2.1.1.2 The CAB shall make modifications to the scoring issues at PI 1.1.1 for fisheries that include setting target reference points at levels which may be lower than MSY as a deliberate measure to allow for reduced biodiversity impact.
 - a. The CAB shall not accept limit reference points set at levels below which there is an appreciable risk of impairing reproductive capacity.
 - SD2.1.1.3 CABs shall address measures in place in the fishery to prevent further ecosystem impacts that may have occurred as a result of the introduction of the species to the new location under the Ecosystem component of Principle 2.
 - a. When relevant CAB's shall define and include an additional scoring issue and corresponding guideposts at 60, 80 and 100 levels to the Ecosystem Management PI 2.5.2 which evaluates measures in the fishery to prevent progression of further ecosystem impacts from occurring due to the presence of the introduced species.
 - b. CABs shall include mechanisms against this additional scoring issue to be:
 - i. Setting target reference points at levels that allow for recovery of species impacted by the introduction,
 - ii. Containment measures such as fishing down at the boundaries of the stock to prevent further spread,
 - iii. Protection and/or creation of faunal refugia,
 - iv. Provisions in legislation to prohibit further introductions of any other alien species.
 - v. Other relevant mechanisms.
 - SD2.1.1.4 The CAB shall provide a rationale to justify why no measures to prevent further impact on biodiversity are considered necessary in that particular fishery if there are no measures in place.

SD2.1.1.5 CABs should define a corresponding Ecosystem Information scoring issue that addresses the collection of information important to understanding and preventing further progression of impact of the introduced species on biodiversity.

SD3 Introduced Species as Non-target Species

SD3.1.1 The CAB shall determine if the introduced species is not the target species in the fishery being considered for certification, but is a primary or secondary species that is impacted in some way by fishing activity on the target species.

SD3.1.1.1 Consideration of how such species are treated in an assessment shall depend on the status accorded that species by management.

- a. If the primary/secondary, non-native species is being managed for high productivity because it is a target species in another managed fishery, then in a similar way to any mainstream MSC assessment, the CAB shall evaluate the fishery to determine that it is not having an unacceptable impact on the non-native, primary/secondary species.
- b. If the non-native primary/secondary species is subject to a formal or informal eradication policy because it is considered to have a “nuisance” status the CAB shall not take the impact of the fishery on the introduced species into consideration in the assessment.

SD4 Implementation of this Annex

SD4.1.1 CABs shall note that this Annex is in effect during a pilot phase which commenced 19 January 2011.

SD4.1.2 CABs that wish to assess an ISBF during this pilot phase shall consult with the MSC on proposed modifications to the default tree.

SD4.1.2.1 CABs should note that the MSC may advise on further considerations to the modification.

SD4.1.2.2 CABs shall submit final trees to be used for ISBF's to the MSC by following the procedure for modified assessment trees in FCR 7.8.5.

SD4.1.3 During the pilot phase CABs shall be required to submit a copy of the Draft Report to the MSC 15 days prior to release of the Public Comment Draft Report.

SD4.1.4 CABs shall advise their clients of the pilot nature of this Annex.

SD4.1.4.1 CABs shall make potential fishery clients aware of the possibility of further changes to requirements in the course of the assessment of the fishery.

End of Annex SD

Marine Stewardship Council

**MSC Guidance for the
Fisheries Certification Requirements**



V2.0, 1st October 2014

Guidance to Implementation Timeframes ▲

Fisheries that announce their first full assessment after the effective date.

Shall apply FCR v2.0 for both the process and standard requirements.

Fisheries that announce their first full assessment before the effective date.

- Should continue to apply CR v1.3 in the assessment, unless they experience a 4 month pause between announcement and site visit, or a 9 month pause between site visit and PCDR publication; in which case FCR v2.0 (process and standard) shall be applied (see FCR sections 7.3.3-4).
- Shall apply the process requirements of FCR v2.0 in their next surveillance scheduled after 1st April 2015, while continuing to apply the standard requirements of CR v1.3.
- Shall apply the standard requirements of FCR v2.0 in their first reassessment announced after 1st October 2017.
- Notwithstanding the normative requirements, may at their discretion apply FCR v2.0 (process and standard) for any fishery assessment that is announced before the effective date.

Certified fisheries and fisheries that are in assessment on 1 April 2015

- Shall apply the process requirements of FCR v2.0 in their next surveillance that commences (is announced) after 1st April 2015, while continuing to apply the standard requirements of CR v1.3.
- Shall apply the standard requirements of FCR v2.0 in their first reassessment announced after 1st October 2017.

Such fisheries will not have to apply the standard requirements of FCR v2.0 until three years after its release and may thus become recertified before such time using the CR v1.3 standard. For instance, a fishery announcing reassessment in September 2017 can still use the CR v1.3 standard, or could voluntarily apply FCR v2.0. But all reassessments announced after 1st October 2017 must use Annex SA from FCR v2.0.

Extension of Scope

For expedited assessments (scope extensions, Annex PE) of components of existing fisheries, CABs shall apply the version of the standard (assessment tree) that was used for the assessment of the originally certified fishery.

Where the scope of a fishery is changed following a scope extension (expedited assessment), the fishery shall be considered a new fishery at reassessment and shall be required to use CR v2.0.

CABs will normally use the same versions of the process and standard requirements from the start to the end of each assessment and surveillance process, except under the conditions specified in 7.3.3-4.

Over the life of a certificate, individual surveillance audits may use different FCR versions (i.e., different process requirements). A specific surveillance process shall not change versions while only partly completed. For example, new process requirements would not be used for reporting a surveillance audit that has had a site visit but not yet produced a report.

Reassessment and the RBF

The RBF includes both process aspects and standard aspects. The v2.0 RBF has for example been developed to include 'cumulative' aspects consistent with the P2 developments of the v2.0 standard.

Although the RBF is included in the FCR as Annex PF, its use with fisheries using the v1.3 standard (i.e., the v1.3 assessment tree) is not mandatory. Fisheries certified against v1.3 and undertaking surveillance using v2.0 processes therefore do not need to apply the RBF annex of FCR v2.0. Nevertheless, a fishery that starts reassessment after April 2015 but before October 2017 may use the v1.3 tree alongside the v2.0 RBF (unless voluntarily adopting the v2.0 tree earlier than required). In this case, CABs should contact MSC to request a variation confirming which aspects of the v2.0 RBF will be used, and what adjustments will be made to ensure consistency with the v1.3 default tree.

Surveillance

Surveillance requirements appear in the FCR v2.0 process section and must therefore be applied after 1st April 2015. Fisheries certified against v1.3 should apply these requirements in surveillance audits that start after 1st April 2015 (or voluntarily earlier if the CAB is ready to adopt FCR v2.0 from that time) and with the exception of requirements to apply the RBF, see above). From this point, the CAB can revise the audit programme detailed in the PCDR in line with the new requirements, e.g., giving increased flexibility in the timing of audits without needing variation requests. Such changes to the future schedule should be clearly described in the surveillance report (see 7.23.10).

Moving from CR v1.3 to FCR v2.0 in a fishery in assessment

As explained above, there are some circumstances (e.g., a delay in the assessment process) where it is necessary to migrate to FCR v2.0 during an assessment. CABs may also at their discretion choose to migrate to FCR v2.0 even if not required by normative process.

For procedural guidance in these cases, see section G7.3.3.

Harmonisation

A fishery being assessed against v2.0 of the MSC Fisheries Standard would not be expected to harmonise with fisheries certified against CR v1.3 where PIs are significantly different. When comparing FCR changes the following should be considered:

If a minor wording change has been made to a PI, but the SG80 language for a particular scoring issue is still effectively the same, it may be appropriate that harmonisation is considered for any condition raised against that issue. The change tracking spreadsheet released with the FCR will qualify where changes to intent have occurred. This can be used in judging where changes are significant.

MSC Cumulative P2 approach

Parts of Principle 2 of the new MSC Fisheries Standard (v2.0) are assessed for all MSC Units of Assessments (UoAs) rather than just the impact of the UoA included in the current assessment process.

Although fisheries certified against CR v1.3 are not yet subject to the 'MSC-cumulative' approach, fisheries being assessed against CR v2.0 are required to take the impacts of these existing MSC fisheries into account where applicable (e.g., where there are overlapping, main primary species). Guidance is provided on this topic under harmonisation in Annex GPB and Annex GSA.

Provision for certificate extensions to apply the new MSC Fisheries Standard

The MSC Board of Trustees agreed to allow fisheries certified against older versions of the MSC Fisheries Standard to extend their certificates to allow them to implement the new FCR v2.0 standard and process requirements rather than be reassessed against the default tree in CR v1.3. This was to encourage fisheries to use the newest version of the standard, including the many clarifications given in the guidance; and to gain access to the speed and cost benefits in the v2.0 process. As the release has now been delayed this policy has been extended to allow these fisheries until 1st December 2014 to make a decision to either proceed with the new FCR v2.0, or to begin reassessment against v1.3.

The provision for continued surveillance during the period of extension applies and CABs should discuss their intention to apply this policy with the relevant MSC FAM.

Annex GSA The Default Assessment Tree – Guidance

Background to Annex GSA Guidance ▲

The Fisheries Standards contain the default assessment tree that ensures high quality, credible fishery assessments and certifications based upon an assessment methodology to be applied consistently across fisheries regardless of ecological, geographical, technological or other variations in characteristics.

The hierarchical structure and the prescribed default set of performance indicators and scoring guideposts (PISGs) are used in all assessments unless a team can show just cause for why a different tree should apply.

The specific objectives and benefits of the default tree are to:

- Improve the common understanding by CABs, clients and stakeholders of how fisheries will be assessed by use of a simple, transparent assessment structure;
- Ensure consistent interpretation and application of the MSC Fisheries Standard to ensure all fisheries are assessed in a similar and equitable manner;
- Increase future certainty about re-assessment for currently certified fisheries;
- Improve the robustness and credibility of fishery assessments by providing greater clarity on required performance;
- Improve the efficiency of the assessment process while maintaining the integrity of the MSC's third party certification approach.

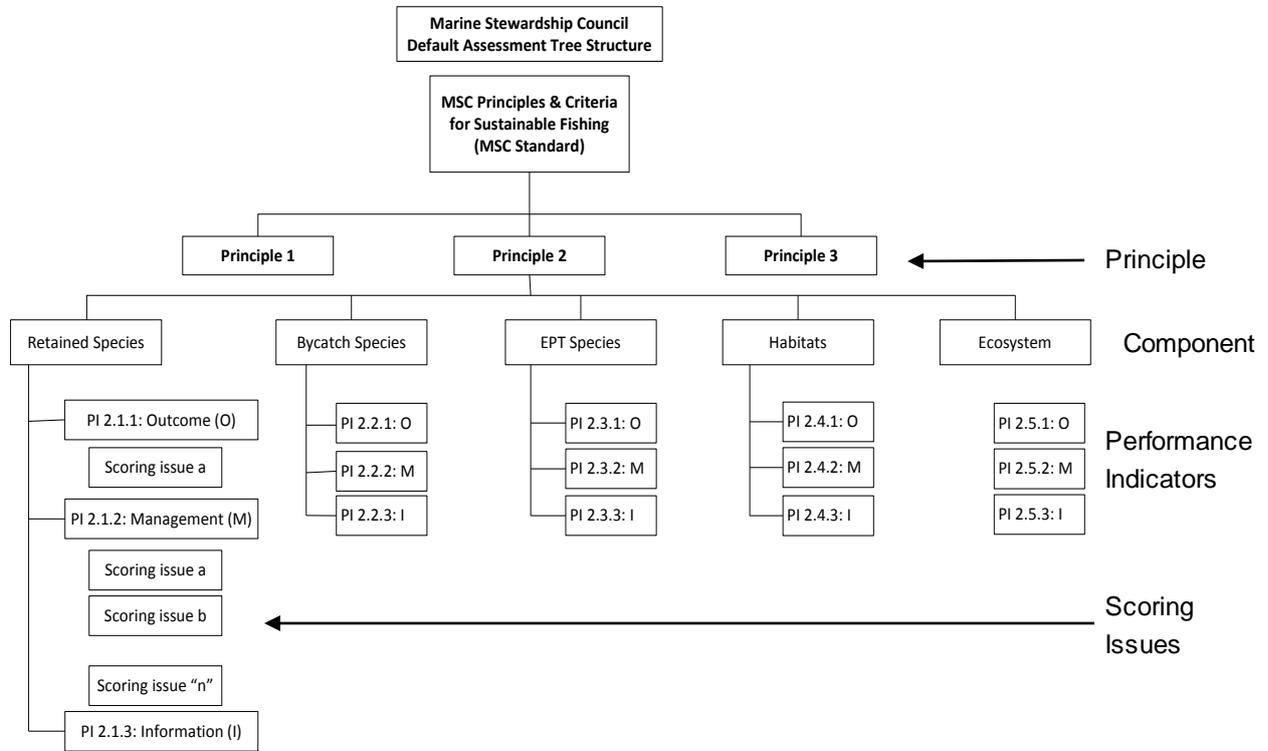
Structure of the Default Tree

The default tree structure is divided into four main levels for the purposes of scoring, as summarised below:

- Principle: The Principles represent the overarching basis for the assessment tree
- Component: A high level sub-division of the Principle
- Performance Indicator (PI): A further sub-division of the Principle

- Scoring Issue (SI): A sub-division of the PI into related but different topics. Each PI has one or more scoring issues against which the fishery is assessed at the SG 60, 80, and 100 levels.

Figure GSA2: Default Tree Levels relevant to scoring fisheries



For each scoring issue, scoring guideposts are defined at 60, 80 and 100 levels. In scoring a fishery, CABs, identify the level achieved by the fishery for each scoring issue, and the overall level achieved as a result for the PI. A fishery must achieve at least a 60 score for each PI, and at least an aggregate 80 score for each Principle in order to pass. Where a score less than 80 is achieved, a condition is assigned.

In some fisheries, multiple ‘scoring elements’ (such as multiple bycatch species or habitats) can also be scored within a given PI. For specific details on scoring, see FCR section 7.10, and the related guidance.

Default, draft and final trees

Annex SA is designed to be applicable to most standard types of fishery. Other default trees are available for some special fishery types such as enhanced bivalves and salmon. Other special trees can be developed by CABs where needed for other unusual fishery types, subject to approval by MSC (see FCR section 7.8.5). In these cases, the “default tree” becomes a “draft tree” while a variation request and stakeholder comment is being sought, then a “final tree” when it is ready for use, with or without changes, in the specific fishery assessment.

Relationship between the Default Tree and the MSC Principles and Criteria

Annex SA was developed to reflect the 1999 MSC Principles and Criteria as its foundation. Table GSA1 illustrates the relationship between topics in the P&Cs and their locations in the FCR v2.0 default tree (as changed from v1.3).

Taking Principle 1 as an example, the three P1 Criteria in the 1999 Principles and Criteria are assessed by the combination of PIs in the default tree, as:

- Each of the outcomes required by the three Criteria is covered by the single Outcome PI (1.1.1).
- The Harvest Strategy (Management) PIs assess a fishery's ability to manage the impact on target stocks to achieve those outcomes sought by the three Criteria.
- Criterion 3, with no specific Outcome PI, is covered by considering its impact on the formulation of the management strategy and the Harvest Control Rule (HCR) and tools.
- For example, the Point below which Recruitment could be Impaired (PRI), scored as a limit reference point in PI 1.1.1, should be set at a point where:
 - There is no danger that genetic changes in the stock would reduce reproductive productivity, and
 - If there is a risk that this may not be so, the limit reference point should be increased accordingly.

The problem might be addressed through changes to the component of the stock that is harvested, for instance by changing the distribution or selectivity of fishing.

Table GSA1: Comparison between the MSC's Principles and Criteria for Sustainable Fishing and the default tree structure (PIs shown in strikeout font and boxes shaded green indicate the changes between the trees in CR v1.3 and CR v2.0)

Criteria	Principle 1 1. Outcome 2. Harvest strategy				Principle 2 1. Retained species 2. Bycatch species 3. ETP species 4. Habitats 5. Ecosystem					Principle 3 1. Governance and policy 2. Fishery specific management				Scope
	1 Stock status 2 Reference-points 3 Recovery & Rebuilding	1 Performance of harvest strategy 2 Harvest control rules & tools 3 Information / monitoring 4 Assessment	1 Status 2 Management 3 Information	1 Status 2 Management 3 Information	1 Status 2 Management 3 Information	1 Status 2 Management 3 Information	1 Status 2 Management 3 Information	1 Status 2 Management 3 Information	1 Legal and/or customary framework 2 Consultation roles and resps 3 Long term objectives 4 Incentives-for-sust-fishing	1 Fishery specific objectives 2 Decision making processes 3 Compliance and enforcement 4 Research-plan 5 Monitoring and evaluation				
Principle 1. Target species														
1 High productivity	■													
2 If depleted, recovery plan		■												
3 Reproductive capacity	■													
Principle 2. Ecosystem														
1 Functional relationships			■	■	■	■	■	■	■					
2 Biodiversity and ETP spp			■	■	■	■	■	■	■					
3 If depleted, recovery plan			■	■	■	■	■	■	■					
Principle 3. Management system														
A Management system criteria														
A1 No controversial unilateral exemption									■				■	
A2 Clear long-term objectives, etc									■					
A3 Appropriate to cultural context and scale				■					■					
A4 Observe legal and customary rights									■				■	
A5 Dispute resolution mechanism									■					
A6 Incentives, no negative subsidies		■		■	■	■	■	■	■					
A7 Timely, adaptive, precautionary									■					
A8 Research plan				■	■	■	■	■	■					
A9 Stock assessments conducted									■					
A10 Mgmt measures and strategies		■		■	■	■	■	■	■					
A11 Compliance, MCS									■					
B Operational criteria														
B12 Bycatch and discards		■		■	■	■	■	■						
B13 Habitat impacts														
B14 Destructive fishing practices													■	
B15 Operational waste													■	
B16 System, legal and admin requirements													■	
B17 Collaboration in data collection									■					

G Scope ▲

The standard is available to all operations engaged in the wild capture of marine or freshwater organisms with the following exceptions:

1. Operations targeting (as Principle 1) amphibians, reptiles, birds and mammals
2. Operations using explosives or poison as their fishing method
3. Operations that are conducted under controversial unilateral exemptions from international agreements, or under conditions of unresolved dispute, if the exemption or dispute creates a situation where effective management of the resource cannot be delivered (FCR 7.4.1)
4. Farmed aquaculture operations, except where these can be described as enhanced fisheries as defined in FCR 7.4.3 onwards
5. Introduced species, except where these can be described as historical and irreversible as defined in FCR Table 2.

GSA1.1 General requirements ▲

Box GSA1: Precautionary approach

The precautionary approach

International and customary law requires the use of the precautionary approach in fisheries management. The MSC uses as its baseline definition for the precautionary approach the definitions included in the FAO International Code of Conduct for Responsible Fisheries (1995) and the UN Fish Stocks Agreement (1995), Article 6 of which states:

The precautionary approach shall be interpreted to mean being cautious when information is uncertain, unreliable or inadequate and that the absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures (The UN Fish Stocks Agreement, 1995).

In the MSC standard the application of the precautionary approach in fisheries management systems is explicitly scored in PIs 3.1.3 and 3.2.2. However the MSC also intends the precautionary approach to be applied implicitly throughout the Certification Requirements. To capture this intent, the MSC system has been designed to give higher scores where there is more certainty about the outcome, or where management systems appropriately apply precaution under conditions of uncertainty. Where limited information is available, teams should be more precautionary in their assessment of information adequacy to support an Outcome PI score.

References

FAO *Code of Conduct for Responsible Fisheries*. Rome: FAO.1995

FAO *Technical Consultation on the Precautionary approach to capture fisheries*. Rome, FAO. 1996.

Rio Declaration on Environment and Development, 1992

The UN Fish Stocks Agreement, United Nations conference on straddling fish stocks and highly migratory fish stocks, Sixth session, New York, 24 July-4 August, 1995

Box GSA2: IUU fishing

MSC's intent and understanding of the standard in relation to illegal, unreported and unregulated (IUU) fishing

The FAO definition of IUU fishing is as follows (FAO, 2002):

Illegal fishing refers to fishing activities:

- Conducted by national or foreign vessels in waters under the jurisdiction of a State, without the permission of that State, or in contravention of its laws and regulations;
- Conducted by vessels flying the flag of States that are parties to a relevant regional fisheries management organisation but operate in contravention of the conservation and management measures adopted by that organisation and by which the States are bound, or relevant provisions of the applicable international law; or
- In violation of national laws or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organisation.

Unreported fishing refers to fishing activities:

- Which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws and regulations; or
- Undertaken in the area of competence of a relevant regional fisheries management organisation which have not been reported or have been misreported, in contravention of the reporting procedures of that organisation.

Unregulated fishing refers to fishing activities:

- In the area of application of a relevant regional fisheries management organisation that are conducted by vessels without nationality, or by those flying the flag of a State not party to that organisation, or by a fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organisation; or
- In areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law.

These definitions of IUU fishing have been adopted and incorporated into Action Plans to deter and eliminate IUU fishing at both the national level (United States, New Zealand and Australia) and regional fisheries management organisations (RFMOs), such as ICCAT and CCAMLR, as well as economic entities (e.g., the European Union). RFMOs publish lists of vessels engaged in IUU fishing in their areas of responsibility.

IUU fishing can also apply at a state level, for example, where coastal nations or their sub-jurisdictions (e.g., internal states or provinces) have inadequate regulation to prevent illegal, unreported or unregulated catches.

In relation to IUU, the MSC intention is that UoAs be harvested legally and that IUU is non-existent, or where IUU does exist it is at a minimum level such that management measures, including assessments and harvest control rules and the estimation of IUU impacts on harvested species and the ecosystem, are capable of maintaining affected populations at sustainable levels.

Specifically:

- Unreported IUU fishing should be considered as “unobserved mortality”.

- The unit of assessment (UoA) should be free from IUU catches of target (P1) species. This will be assessed in P1 and in P3 (compliance with national and international laws and monitoring, control and surveillance [MCS]; PIs 3.1.1, 3.2.2, 3.2.3).
- The stocks that are the source of P1 certified fish should have only minimal IUU fishing, which must be taken into account by management and must not have a material impact on the ability of the management system to deliver a sustainable fishery; this should be clearly considered by assessment teams in the PIs on harvest control rules, information, and assessment of stock status in P1 (e.g., 1.2.2, 1.2.3, 1.2.4), including in documentation of unobserved mortality.
- The requirement for compliance with national and international laws combined with the requirement that the UoA should not be causing serious and irreversible harm in P2 means that the UoA should also be free from IUU fishing for P2 species. While the impact of other IUU fishing on P2 components should be documented where known, unlike in P1, it need not be introduced into the assessment of the specific impact of the UoA (or cumulative UoAs).
- The MSC chain of custody standard requires that neither chain of custody certificate holders nor certified UoAs should use vessels that are listed on IUU blacklists to catch or transport fish.
- The MSC chain of custody standard is designed to ensure that MSC-labelled products cannot be mixed with products from a non-certified UoA, where there may be a risk of IUU fishing.

Specific guidance is provided in the GCR, which has evolved since FAM v1 (2008) to include guidance in relation to local and national laws, as well as international laws:

- PI 1.2.3: [GSA2.6.1](#) on information categories to consider for fishery removals.
- P2 general guidance: [GSA3.1.8](#) on considering observed and unobserved fishing mortality, including illegal fishing and/or unregulated catches.
- PI 3.2.3: [GSA4.1](#) on considering compliance and enforcement.

Evaluation of effectiveness of MCS in UoAs where a less formalised MCS system exists may consider the role and effectiveness of a range of factors in deterring illegal activity, which are described in [GSA4.9](#) on assessing informal and traditional approaches in PI 3.2.3. Additional guidance on P3 (PI 3.2.3.) is given in [GSA4.9](#).

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MSC (2014) Guidance to the MSC Fisheries Certification Requirements V2.0

GSA2 Principle 1

GSA2.1 General requirements for Principle 1 ▲

There are two components in Principle 1: an outcome component with two PIs and a management component with four PIs.

Outcome Component

Background

The outcome component has two PIs. The stock status PI (1.1.1) is scored to reflect management behaviour that:

- increases the probability that exploited biomass fluctuates around the B_{MSY} target, or a higher target if this is warranted from a consideration of the trophic inter-dependencies of the target species (see Box SA1 below); and
- decreases the probability that exploited biomass will drop significantly towards the point where recruitment becomes impaired, either through recruitment overfishing or through genetic effects or imbalances in sex ratio.

The rebuilding PI (1.1.2) is triggered in cases where PI 1.1.1 does not achieve an 80 level, to ensure that stock rebuilding is expected. Stocks whose status is currently below the point at which recruitment is impaired (termed the PRI) would not achieve the necessary pass level in PI 1.1.1 even if there are recovery plans or programmes in place which are effectively increasing the status of the stock, until such time as the stock status again meets SG60.

The following outcomes would attract scores of 80 or higher:

- A higher likelihood of fluctuation around the target biomass level.
- Biomass levels in excess of target levels, which imply a lower probability of being below target levels.
- A higher probability of being above the point at which recruitment could be impaired, often used as a biomass limit reference point.
- In PI 1.1.2, a more rapid demonstrated rebuilding of stocks from the point where they attract only a 60 score to levels able to deliver MSY.

An explanation of MSC's intent and understanding in relation to MSY is provided in Box GSA3.

Box GSA3: MSC intent on the achievement of MSY in P1

MSC intent on the achievement of MSY in P1

The MSC intention is that fisheries be harvested no more than is consistent with MSY (as required by UNCLOS), and that this is achieved through use of appropriate target and limit reference points and of harvest strategies (as required by UNFSA and CoCRF).

- A target reference point reflects a management objective to be achieved (e.g., performance consistent with MSY) while the limit reflects an undesirable state to be avoided with high probability (e.g., impaired recruitment).

The most basic definition of MSY is the largest long-term average annual catch that can be sustained over time. The FAO Glossary defines MSY as “*the largest average catch or yield that can continuously be taken from a stock under existing environmental conditions. For species with fluctuating recruitment, the maximum might be obtained by taking fewer fish in some years than in others.*” The constant fishing mortality that gives this MSY is F_{MSY} , and the average population size while MSY is provided is B_{MSY} .

- MSY was originally defined in terms of simple production models, but the concept is now equally applicable to any model of the stock and fishery (e.g., more complex production models, dynamic pool models, ‘per recruit models’, multi-stock/mixed stock models, ecosystem models and meta-population models).
- There are many ways to estimate MSY and related reference points. Many of them, and particularly the older methods which were common at the time UNCLOS and UNFSA were agreed, make substantial assumptions and so there can be considerable uncertainty about the accuracy of the estimates of MSY and related reference points.
- Because the productivity (e.g., recruitment) of many fish stocks is naturally highly variable through time the biomass can vary greatly around B_{MSY} (in some cases even with an appreciable chance of the stock being below the biomass limit reference point) when fished at the constant F_{MSY} . To an extent this variability in stock biomass can be mitigated by use of a harvest control rule that reduces the fishing mortality when stock biomass is low or a limit reference point is approached, as recommended by UNFSA and CoCRF. For some harvest control rules, including the constant escapement policies common in salmon and some low small pelagic fisheries, the fishing mortality is reduced to zero at a threshold stock biomass (e.g., Mace 2001).
- Reflecting the uncertainty usual in the estimation of MSY reference points and the variability of productivity usual in fish stocks the UNFSA guidelines and others (e.g., Mace 2001) recommend that F_{MSY} should be treated as a precautionary limit reference point, rather than a target reference point. This is appropriate in ‘common practice’ application of the MSY concepts, in which there is little explicit consideration of uncertainty and/or use of approximate methods for determining MSY reference points and/or use of surrogates for fishing mortality or stock biomass.
- The ‘best practice’ current view of MSY is that it is the largest long-term average catch that results from a constant F or variable F harvest control rule, while simultaneously giving a high chance of avoiding the biomass limit reference point, with MSY determined by simulation testing (e.g., Management Strategy Evaluation methods; Sainsbury et al. 2000, Butterworth and Punt 2003) that includes realistic representation of the major likely uncertainties (e.g., observation uncertainty, estimation uncertainty, recruitment variability, model structure uncertainty, implementation uncertainty). F_{MSY} determined this way could be an appropriate target

reference point, because its method of calculation internalises uncertainty, variability and the biomass limit reference point.

MSY stock status

- The stock status consistent with MSY is fundamentally defined in terms F_{MSY} and B_{MSY} , and so the MSC standard provides default target and limit reference points for these. Approximations for F_{MSY} and B_{MSY} can be used where they are expected to achieve performance consistent with MSY (e.g., Witherall et al 2000, Clarke 2002, Zhou et al 2012).
- Directly measurable (empirical) proxies or surrogates for fishing mortality or biomass (eg., average length or length distribution, catch rate, recruitment, escapement etc.), and associated empirical harvest strategies, can be used where they are expected to achieve performance consistent with MSY or a similar highly productive level (Starr et al 1997, Prince et al 2011).

Multi-stock fisheries (containing biological interactions but stocks are separately assessable), mixed-stock fisheries (containing technical interactions but stocks are separately assessable) and stock-complex fisheries (where some or all of the stocks cannot be individually assessed so are managed as a group).

- Multi-stock fisheries and mixed-stock fisheries. The existence of biological and/or technical interactions means that fishing on one stock has an effect on others. So it is not possible to simultaneously obtain the maximum sustainable yield from each of the individual component stocks. A compromise is required to obtain what is considered the best yield from the combination of stocks. At two extremes, for example, it could be considered that the least productive stock will be harvested up to its MSY so that all other stocks are harvested at less than their individual MSYs or it could be considered that the most productive stock will be harvested up to its MSY so that all other species will be harvested beyond their individual MSYs (i.e., fishing mortality higher and biomass lower than the MSY levels). MSC recognises this as a management choice for the target reference point for each species (e.g., UNFSA Annex II para 2), but also currently requires that the single species (or single stock) limit reference points be maintained (cf the US approach that requires no species be reduced such that it triggers the threatened species listing).
- Stock-complex fisheries. MSY for the stock complex as a whole may be determined or indicator stocks may be used for assessment purposes (e.g., US National Standard), but MSC requires that there is a good basis for expecting that none of the component stocks are reduced below their limit reference point.
- The MSC requirements in Principle 1 do not currently take account of such interactions between stocks, being based on expectations applicable in a single species (or single stock) context. MSC is considering further developments in this area, and monitoring the development and application of such methods as 'best practice' in management agencies, globally. Further consideration of this will be given in the 2018 standard review. Prior to that point, CABs may propose the use of special assessment trees for the assessment of such fisheries (per FCR 7.8).
- In the statements above, the term 'stock' may refer to either a single species, or to a sub-stock of a species, consistent with the MSC definition given in the Glossary. A 'mixed-stock' fishery may for example be based on several different species, or on two or more sub-stocks of the same species, which have overlapping distributions in the area of capture. The distinctions made between multi-stock, mixed-stock and stock-complex fisheries here thus relate to the nature of their interactions and the practicalities of their management, and not to the levels of genetic differences between the stocks.

- Where fisheries are based on multiple sub-stocks of a single species, attention should also be given to the guidance on metapopulations (Section G7.4.7). In these cases, the recognition of specific 'source' and 'sink' populations may lead to different expectations for these individual stocks, but the metapopulation as a whole should still be maintained at productive levels (as required in SA2.2.6).
- Further consideration is also needed in the case of salmon fisheries, as outlined in the modified assessment tree in Annex SC. In this case, overall fishery production is assessed at the level of 'Stock Management Unit' (SMU), equivalent to the normal stock in a single species/stock fishery, but fisheries are also expected to manage the diversity and productivity of individual populations within the SMU.

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Harvest Strategy (Management) Component

Background

The harvest strategy (management) has four PIs. These PIs assess a fishery's ability to manage the impact on target stocks to achieve the outcomes sought by the MSC Principle 1. The overall harvest strategy and the specific management components in PIs 1.2.2-1.2.4 should in combination be capable of achieving the management objectives expressed in the target and limit reference points.

Subsidies in fishing

MSC does not name individual subsidy types as harmful or not harmful to fishing. Some subsidies may, however, contribute to overcapacity, which may compromise the ability of a management system to effectively control fishing effort.

When considering the effectiveness of a management strategy and its ability to meet P1 and P2 outcomes, CABs should take into account any problems that might be caused by fishing overcapacity, or other issues, that can result from subsidies.

If overcapacity exists as a result of subsidies, the management system should be robust enough to deal with this issue and still deliver a sustainable fishery in accordance with MSC Principle 1 & 2.

If the management system is not robust enough to deal with overcapacity caused by subsidies, a condition should be set in accordance with 7.11 against the relevant management PI.

Shared and straddling stocks and highly migratory stocks

When considering management PIs under P1 in fisheries that target shared stocks, straddling stocks or highly migratory stocks, CABs should consider all national and international management systems that apply to the stock and the capacity of these systems to deliver sustainable outcomes for P1.

International management systems may include Regional Fisheries Management Organisations (RFMOs), bilateral/multilateral arrangements and other international arrangements with similar intent.

GSA2.2 Stock Status PI (PI 1.1.1) ▲

GSA2.2.2 Scoring fluctuations around the target MSY level -scoring issue (b) ▲

Scoring issue (b) of PI 1.1.1 requires that the P1 stock (biomass) is fluctuating around a level, B_{MSY} , at which maximum sustainable yield may be achieved, or around a higher level where appropriate. Fluctuation in this context refers to the variability over time around a point, acknowledging that the magnitude of fluctuation will be influenced by the biology of the species, and that short-term trends may be apparent in such fluctuations.

In considering PI 1.1.1 scoring issue (b) and SA2.2.2, teams should provide a clear rationale by which it is argued that the SG80 or 100 levels are met, including the details of the time period over which this is assessed. Such rationale should take into account the specific biology of the species and the stock status in recent years.

Examples of situations that may be regarded as “fluctuating around a level consistent with MSY” and thus able to achieve at least an 80 score for PI 1.1.1 scoring issue (b) are given

below. In considering these examples, teams should note that the $90\%B_{MSY}$ figure is given as a hypothetical level that may be appropriate for species types with average levels of fluctuations. Other values may be appropriate for other species types. These examples are thus provided as illustrations of different ways in which rationales may be constructed rather than explicit requirements. Teams should further keep in mind that the rationale should demonstrate fluctuation around a level 'consistent with B_{SMY} ', not a level consistent with $90\%B_{MSY}$.

Examples: 80 score

Examples of situations that may be regarded as "fluctuating around a level consistent with B_{MSY} " and thus able to achieve an **80 score** for PI 1.1.1 scoring issues (b) are given below:

- An instantaneous estimate of current stock status that is not less than $90\%B_{MSY}$.
- A recent series of estimates of stock size that has a median or mean value over the last one generation time that is not less than $90\%B_{MSY}$, and which has a trend that is consistent with an expectation that the future biomass will continue to fluctuate around B_{MSY} . (For definition of 'generation time', see guidance [GSA2.2.4](#))
- A consistent downward trend over recent years to levels below B_{MSY} would not be consistent with this expectation unless accompanied by projections or other information suggesting that the trend will soon be reversed (e.g., due to incoming strong recruitment or recent reductions in exploitation level). The time series may include estimates that are less than $90\%B_{MSY}$, so long as these are shown to be part of a long-term fluctuation around B_{MSY} .
- A series of estimates showing a steady increase in stock size that has recently returned to a level not less than $90\%B_{MSY}$, and is expected to continue building to above B_{MSY} , and thereafter to fluctuate around B_{MSY} .

Examples: 100 score

Examples of situations that may achieve the higher **100 score** on PI 1.1.1 scoring issue (b) are given below:

- A recent series of estimates of stock size that has a mean or median over the last two generation times that is not less than $90\%B_{MSY}$.
- A series of estimates of stock size that have been above B_{MSY} in all years of the last one generation time.

In reviewing fluctuations in stock size, teams should note that a model-derived estimate of stock size from the most recent year will often be more uncertain than earlier years. Teams should take this into account so as to avoid rapid changes in status of MSC certified stocks, which are possibly not indicative of actual material change in stock status, and so avoid unnecessary changes in certification status as specified in FCR paragraph 7.23.23.1.b A single estimate of stock status unsupported by an estimate of certainty either derived from a time series trend or from a statistical model, should only rarely be used to justify a material change in the score.

MSC has chosen not to define its requirements in relation to the commonly used definitions "overfished" and "overfishing". Nevertheless, these terms are commonly used, and are referred to in some guidance as follows:

- Overfishing: fishing mortality higher than F_{MSY} , the fishing mortality level that results, in the long term in the stock being at maximum sustainable yield
- Overfished: biomass stock size lower than a limit defined in relation to MSY. The FAO Ecolabelling Guidelines define “overfished” as below a biomass limit reference point. The limit is often taken to be 50% B_{MSY} , which is the default assumption for the point below which recruitment may be impaired (PRI) as defined by the MSC. However, the term is not commonly used internationally to relate to the PRI, and hence its use in MSC guidance and CR language is limited.

GSA2.2.3 Determination of status with respect to PRI and B_{MSY} ▲

The wording of PI 1.1.1 requires scoring against the conceptual levels PRI and MSY. Such levels may or may not be used as explicit reference points in a fishery. There may be situations where well-managed stocks do not have target reference points or do not have limit reference points, or their values are not consistent with the conceptual levels of PRI or MSY. The stock will still need to be assessed in terms of the overall outcome objectives, i.e., for SG80 that the stock status is highly likely to be above the point at which there is an appreciable risk that recruitment is impaired, and will be at or around a level consistent with B_{MSY} .

All management systems should thus have reference points of some sort, as confirmed in PI 1.2.4 (scoring issue (b)). Where these are not stated explicitly they should be implicit within the decision rules or management procedures, and the fishery should be assessed using these implicit reference points.

An explicit use of only a target reference point should include some implicit consideration of a limit reference point, and likewise a management system that uses only a limit reference point will have some implicit acknowledgement of targets.

In requiring that fish stocks are ‘likely above the PRI’ (SG60 in PI 1.1.1), MSC recognises that fish stocks do not have an exact and constant level below which recruitment will always be impaired. In a Beverton-Holt type stock-recruit relationship, recruitment declines with any reduction in stock size from the unexploited level. The PRI should be interpreted as the point below which there is an increased risk that recruitment may be substantially impaired and fisheries should be managed such that the risk of stocks falling below this level is very low. Where historical estimates of stock size and resulting recruitment are available, the PRI may be identifiable as the point below which reduced recruitment has been observed in the past, and above which recruitment appears to be more related to environmental factors than to stock size. MSC default proxies for the PRI and MSY are given in the following sub-section.

GSA2.2.3.1 Use of proxy indicators and reference points for PRI and B_{MSY} ▲

In this section the term “reference point” is used in relation to determination of status, not in relation to harvest control rules (see additional guidance on this distinction in [GSA2.6](#)).

Writing the PISGs in terms of biomass and fishing rate metrics creates an appearance that the MSC Fisheries Standard is not well suited for other than large industrial fisheries with formalised stock assessments and biomass based reference points. This is not the intent.

[SA2.2.3](#) confirms that teams may allow the use of surrogate or proxy indicators and reference points in scoring both stock biomass and exploitation rate. The terms “likely”, and “highly likely” are used to allow scoring by either qualitative or quantitative approaches.

- Examples of qualitative interpretation include analogy with similar situations, plausible argument, empirical observation of sustainability and qualitative risk assessment.
- Examples of quantitative interpretation include the use of measured data from the relevant fishery, statistical analysis, quantitative risk assessment and quantitative modelling.

Default values for the levels of the PRI and B_{MSY} , as used in scoring the stock status PI 1.1.1 are given below. They are often related to B_0 , the stock status that would be present in the absence of fishing.

- In the case where neither B_{MSY} nor the PRI are analytically determined, the following default reference points may be appropriate for measuring stock status depending on the species: $B_{MSY}=40\%B_0$; $PRI=20\%B_0=\frac{1}{2}B_{MSY}$.
- In the case where either B_{MSY} or the PRI are analytically determined, those values should be used as the reference points for measuring stock status unless additional precaution is sought.
- In the case where B_{MSY} is analytically determined to be greater than $40\%B_0$, and there is no analytical determination of the PRI, the default PRI should be $\frac{1}{2}B_{MSY}$. This case covers the situation of low productivity stocks, where higher default PRIs may be justified.
- In the case where B_{MSY} is analytically determined to be lower than $40\%B_0$ (as in some highly productive stocks), and there is no analytical determination of the PRI, the default PRI should be $20\%B_0$ unless $B_{MSY}<27\%B_0$, in which case the default PRI should be $75\%B_{MSY}$.
- For stocks with average productivity, where B_{MSY} is not analytically determined but assumed to be $40\%B_0$ and a management trigger reference point is set greater than $40\%B_0$ for precautionary reasons, the default PRI should still be set at $20\%B_0=\frac{1}{2}B_{MSY}$ unless it is analytically determined. This covers situations where the management authority has deliberately chosen a conservative target reference point, but where the default PRI is still appropriate.
- In cases where the PRI is set at $20\% B_0$, a default value for the B_{MSY} may be assumed to be $2xPRI$. In other cases, for instance where the PRI is set at the lowest historical biomass, it cannot be assumed that $B_{MSY} = 2xPRI$. Teams shall justify any reference point used as a proxy of B_{MSY} in terms of its consistency with B_{MSY} .

The default PRI values given above ($\frac{1}{2}B_{MSY}$ or $20\%B_0$) apply to stocks with average productivity. Such points are generally consistent with being above the point at which there is an appreciable risk that recruitment is impaired, though for some short-lived stocks the actual point at which there is an appreciable risk that recruitment is impaired may be lower than $20\%B_0$ and for some long-lived species it may be higher than this.

Where management has defined a target range for B_{MSY} rather than a single value, the team should score the stock status PI 1.1.1 against this range. The team should also consider if different reference points are required for different components of the stock in their assessment.

Where proxies are used that are not expressed as percentages of B_0 , teams should generally ensure that:

- Any reference point used as a proxy for scoring the PRI is set above the point where there is an appreciable risk of recruitment failure; and

- Any reference point used as a proxy for the MSY level maintains the stock well above the PRI and at levels of production and stock sizes consistent with B_{MSY} or a similar highly productive level.

Where proxy reference points are defined in this way, teams should take account of the difference between the reference point and the required (PRI or MSY) levels in their scoring.

Particular caution should be given regarding 'per-recruit' stock assessment approaches that do not include any form of stock-recruit relationship. Levels of $F_{0.1}$ or $F_{40\%SPR}$ will usually, for example, provide more reliable proxies of F_{MSY} than F_{max} when a per-recruit approach is used. Reference points such as BPA that are used as a precautionary buffer to reduce the chance of declining to a limit level such as the PRI should also not be assumed to be consistent with B_{MSY} . The $B_{MSYtrigger}$ approach used in ICES, for example, should be regarded as setting a lower limit to the likely range of values that B_{MSY} may take, and not as an estimated value for B_{MSY} .

In ICES assessments, fisheries with $B > B_{MSYtrigger}$ may be regarded as "fluctuating around B_{MSY} " (thereby achieving an 80 score).

Proxy indicators and reference points or measuring stock status may also be used where the exact relationship with the PRI, B_{MSY} and F_{MSY} levels are not known. In these cases, the team must provide justification that these proxies are reasonable for the context in which they are used.

Examples: proxies

Examples of such proxies and necessary considerations are given below:

- Where empirical values of CPUE (not based on an explicit stock assessment) are used as reference points for monitoring biomass, teams could provide rationales that the values adopted are consistent with MSY or a similar highly productive level. Checks may be needed to ensure, in this case, that spatial changes in fishing, or changes in the catchability of gears do not reduce the reliability of the proxy indicators.
- Where reference points for measuring stock status are based on some historical state, the position of the stock at that time should be considered relative to the unexploited level and the likely proximity to B_{MSY} . Evidence should be presented that the stock was not over-exploited at the historical reference time and that the catch was sustainable and highly productive.
- Where mean fish sizes are used as reference points for the exploitation level, teams should provide rationales that the values adopted are consistent with F_{MSY} or similar levels.
- Other examples include crustacean fisheries that seek to protect from harvest the complete female reproductive capacity in the population (i.e., single sex harvest). The reference points used here could relate to metrics such as percent fertilised eggs and or other female population indicators that are evaluating the management system's effectiveness at achieving its goal.

Where proxy reference points are used in scoring the stock biomass status, higher scores should be assigned where greater confidence is provided by the proxy information (such as with a 'traffic lights' approach to management).

Examples: using proxy reference points

Examples of how the 60, 80 and 100 SG levels may be justified in these situations are given below:

- **At SG60:** If no decline has been observed in **one proxy** of biomass for at least one generation time of the species and the proxy indicates that the stock is **likely above the PRI**.
- **At SG80:** If no decline has been observed in **two proxies** of biomass for one generation time and at least one proxy indicates that the stock is at a **highly productive level**.
- **At SG 100:** If no decline has been observed in three proxies of biomass for one generation time and at least **two proxies** indicate that the stock is at a highly productive level.

In these cases, where higher scores are justified by the use of more than one proxy indicators, such proxies should be independent of each other and also reasonably be expected to be proxies of the quantity of interest (such as CPUE in the case of stock biomass). The team should present a rationale for how the proxies conform to these principles.

In some cases, it may reasonably be argued that one good proxy is better than two or more weak proxies.

GSA2.2.4 Scoring stock status using fishing mortality rate (F) ▲

Clause SA2.2.4 also allows the use of fishing mortality as a means of scoring PI 1.1.1 when biomass information is not available. Obviously, a fishery that is currently at or below the point at which recruitment is impaired will not suddenly be at MSY if fishing mortality is reduced to F_{MSY} .

The history of fishing mortality should be examined to determine whether the stock biomass could be assumed to be at the required level for each SG. Obviously this depends on the starting status for stock biomass, the trajectory of fishing mortality and the length of time that fishing mortality has been at a certain level.

The following expectations should be applied if the starting biomass is unknown:

- At least a **60 score** is justified if F is likely to have been **at or below F_{MSY}** for at least **one** generation time of the species (or for at least two years, if greater). This level of F is generally expected to be able to recover, or maintain, a population to be “likely” above its PRI.
- At least an **80 score** is justified (B highly likely above the PRI and at or fluctuating around B_{MSY}) if F is likely to have been **at or below F_{MSY}** for at least **two** generation times (or for at least four years, if greater).
- A **100 score** is justified if F is highly likely to have been **below F_{MSY}** for at least **two** generation times (or for at least four years, if greater).

Clearly these are just guidelines, based on an assumption that fishing mortality will in these cases be at or very closely below F_{MSY} . The lower the fishing mortality has been, the shorter the time interval required for recovery. For instance, while most species require about 2 generation times to recover from the PRI to B_{MSY} when fishing is at F_{MSY} , when F is reduced

to 80% F_{MSY} or 60% F_{MSY} , the time for recovery may be halved. CABs should take these issues into account when scoring.

Box GSA4: Generation time

Definition: Generation time (GT)

The MSC defines a generation time as the average age of a reproductive individual in an unexploited stock, consistent with the definition in Goodyear 1995⁴

$$G = \frac{\sum_{a-1}^A a E_a N_a}{\sum_{a-1}^A E_a N_a}$$

where a is age, A is the oldest age in an unfished state, E_a is the maturity at age a , and N_a is the number per recruit alive at age a in the absence of fishing, i.e.,

$$N_a = N_0 e^{-Ma} \text{ where } M \text{ is natural mortality and } N_0 = 1 \text{ (per recruit).}$$

A reasonable approximation for GT, when $0.1 \leq M \leq 2$ is

$$1/M + A_{m50}$$

where A_{m50} is the age at 50% maturity.

Box GSA5: Consideration of fishing mortality rate in MSC assessments

Consideration of fishing mortality rate in MSC assessments

The guidance in this section covers the specific situation where fishing mortality (F) is being used as an indicator of the status of the stock, when actual biomass estimates are not available. In this case, F must have been low enough for long enough for the required biomass levels to have been achieved.

Guidance is also provided later on the use of fishing mortality information, where it is available, in its more normal context as an indicator of the level of exploitation in a fishery. This is particularly relevant in the scoring of the rebuilding PI, 1.1.2, and the harvest control rule (HCR) PI, 1.2.2. The general expectations in these cases are summarised below:

- **PI 1.1.2 (rebuilding):** When Biomass (B) is below a level at which it could be regarded as 'fluctuating around B_{MSY} ', then F should normally be less than F_{MSY} , in order to achieve recovery to such level.
- **PI 1.2.2 (HCRs):** To be regarded as working effectively, HCRs will normally maintain F equal to or less than F_{MSY} .

Only a few exceptions to these general 'rules' are allowed, as supported by clear justifications, such as the special nature of a stock assessment approach or the availability of other specific information. For further details, see the guidance sections [GSA2.3.4](#) and [GSA2.5](#) (scoring issue (c)). Teams should also note that F should be maintained at lower than MSY levels in key LTL fisheries.

⁴ Goodyear, C.P. 1995. Red snapper in U.S. waters of the Gulf of Mexico. NMFS/SEFSC. Cited by Thompson, G. G., Mace, P. M., Gabriel, W. L., Low, L. L., Maccall, A. D., Methot, R. D., ... Witzig, J. F. (1998). Technical Guidance On the Use of Precautionary Approaches to Implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act.

GSA2.2.5 Stock complexes ▲

See comments on multi-stock and mixed stock fisheries and stock complexes in Box GSA3.

GSA2.2.7 Consideration of environmental variability (including climate change) and human-induced impacts ▲

MSC recognises that the productivity of fisheries is affected by a range of environmental factors, as much as by the levels of fishing and the management of the fishery. The actual values of reference points may thus change over time as reflected in stock assessments, and these changes may be allowed for in scoring the status of the stock in PI 1.1.1. Section [SA2.2.7.2](#) recognises the situation where the productivity of the fishery is reduced either by excessive fishing, or by other human-induced impacts (e.g., the clearance of mangrove swamps affecting fish nursery areas). In these cases there is no justification for reducing the reference points and the fishery should receive a lower score until effective management is in place and the stock returns to healthy levels.

However, the MSC recognizes the multipurpose nature of use patterns particularly in inland waters. Example uses include dam construction for water supply and power, channelization for navigation and flood control, land drainage and wetland reclamation for agricultural uses etc. Such uses are generally fundamental to the functioning of modern society and outside of the management control of the fishing sector. Where users from other sectors (non-fishery) have impacts on the fishery, management should take into account these impacts when devising a strategy for achieving management objectives.

Example:

If water is withdrawn for agriculture and urban supply and this has an adverse impact on fish stocks, the management of the fishery is expected to address this fact (perhaps by reducing fishing or time/area closures).

Although climate change is now generally accepted as a potential ‘human-induced’ impact on fishery productivity, it is not one that can be easily ‘resolved’ in the sense required by [SA2.2.7.2.a](#). Such changes are thus regarded as more similar to the situation with regularly occurring (e.g., decadal) cycles or regime shifts, as covered under [SA2.2.7.1](#). Teams should note the further guidance on scoring of climate changes in PIs 1.1.2 (Stock Rebuilding – see [GSA2.3](#)), 1.2.2 (Harvest Control Rules, and the scoring or uncertainty), and in 2.5.3 (Ecosystem Information – see [SA3.18.1.2](#)).

Consequently, in situations where there is evidence that productivity changes are related to the impacts of long-term climate change, CABs should that appropriate adjustments need to be made to reference points and indicators used to determine stock status.

GSA2.2.8 Treatment of key Low Tropic Level (LTL) stocks ▲

The MSC’s intent for consideration of trophic level is that the management of all target species should in some way take into account their trophic level. To date the MSC has only defined specific management and outcome performance requirements for key LTL stocks, because of the highly important role that they play within ecosystems. CABs should also consider whether management needs to be particularly precautionary for very long lived or

high trophic level species. For example, generic reference points appropriate for low trophic level, short lifespan, high fecundity species would be those appropriate to such species, rather than those appropriate for high trophic level, long lived, low fecundity species. See guidance above on reference points.

Box GSA6: Special management requirements for key Low Trophic Level stocks

Special management requirements for key Low Trophic Level stocks

The ecological importance of Low-Trophic Level (LTL) species such as sardines, anchovy and krill, also referred to as forage fish species, and the control they can exert on the rest of the food web has been well established (e.g., Cury et al, 2000). They are often a fundamental part of marine food webs, but are also used by humans for a variety of purposes. Ninety percent of the forage fish catch is “reduced” to fishmeal or fish oil for use in the agriculture, aquaculture, pet food, and other industries and to a limited extent also used for human consumption. In recent years, the extraction of forage fishes from the ocean has escalated enormously, and these species currently comprise approximately 37% of the global wild marine fish catch with further increases likely (Pikitch et al, 2012).

Due to their often significant ecological importance, unsustainable exploitation of forage fish populations can impact the marine food web (e.g., causing declines in seabird and marine mammal populations) or even threaten food security in some countries by diverting forage fish from use as food for humans.

The intent of the MSC requirements on the treatment of LTL stocks is focused on limiting the ecosystem impacts caused by the commercial harvest of these important species.

A principal distinction within the MSC requirements is the recognition of key LTL stocks as separate from non-key LTL stocks. The intent is that all forage (LTL) stocks need to be assessed against their potential ecosystem importance when applying for certification against the MSC standard, but the specific higher management requirements only apply to those stocks recognised as ‘key LTL’.

As defined in FCR section SA2.2.9, there are three criteria which are used to identify whether or not an LTL stock is key:

- the connectance of the species to other organisms within the system,
- the proportion of energy of that gets channelled through the species, and
- whether the system is wasp-waisted following the definition in Cury et al (2000).

Essentially, if it is evident that a species is highly connected in the food web and found in the diets of many predators, it will likely be a key LTL stock. The MSC guidance on this topic ([Section GSA2.2.9](#)) provides examples of how these criteria can be shown to be met or not met. Following a precautionary approach, if it is not possible to provide a justified argument that at least two of the criteria are NOT met, then the stock must be treated as key LTL.

The first two criteria are based on results from Smith et al, 2011 and Essington and Pláganyi, 2013 and the thresholds used relate directly to the levels of ecosystem impact that the depletion of the LTL species would have. If a species is determined to be key, the removal of this species beyond defined precautionary reference points would likely cause a cascade effect in the wider ecosystem. Other predators dependent on the LTL species as food may for example see a decrease of more than 70% in their abundance.

MSC defines the default precautionary reference points for management of key LTL species as either a biomass that is 75% of the unexploited level in the system, or a target exploitation rate of $0.5F_{MSY}$ or $0.5M$ (natural mortality of the species). In fisheries where there is sufficient understanding of the system, these default reference points can be adjusted to specific levels appropriate to the fishery, which are shown not to have adverse ecosystem effects through the use of credible ecosystem models (as defined in SA2.2.13).

If an LTL stock is not key, it is assumed that the impacts of removing it are not of particular importance to the wider ecosystem. It can therefore be assessed as normal within the MSC system and evaluated against the standard MSY-equivalent levels of biomass and fishing mortality.

References

Cury, P., Bakun, A., Crawford, R. J. M., Jarre, A., Quiñones, R. A., Shannon, L. J., and Verheye, H. M. 2000. Small pelagics in upwelling systems: patterns of interaction and structural changes in “wasp-waist” ecosystems. *ICES Journal of Marine Science*, 57: 603–618.

Essington T and Pláganyi E., 2013. Model and data adequacy for Marine Stewardship Council key low trophic level species designation and criteria and a proposed new assessment index. *Marine Stewardship Council Science Serie*, <http://www.msc.org/business-support/science-series/volume-01-1/model-and-data-adequacy-for-marine-stewardship-council-key-low-trophic-level-species-designation-and-criteria-and-a-proposed-new-assessment-index>

Pikitch, E., Boersma, P.D., Boyd, I.L., Conover, D.O., Cury, P., Essington, T., Heppell, S.S., Houde, E.D., Mangel, M., Pauly, D., Pláganyi, É., Sainsbury, K., and Steneck, R.S. 2012. *Little Fish, Big Impact: Managing a Crucial Link in Ocean Food Webs*. Lenfest Ocean Program. Washington, DC. 108 pp.

Smith, A.D.M., Brown, C.J., Bulman, C.M., et al. 2011. Impacts of fishing low-trophic level species on marine ecosystems. *Science* 333, 1147–1150.

GSA2.2.9 Identification of key Low Trophic Level (LTL) stocks ▲

Ways of demonstrating whether a stock under assessment should be treated as a key LTL stock may include the use of qualitative information on the ecosystem, diet matrices to construct food webs and/or the use of ecosystem models that demonstrate the connection between species and trophic groups in the ecosystem.

- If ecosystem models are to be used they must be “credible”. “Credible” should be interpreted to mean:
 - Publicly available and well documented;
 - Fitted to time series data; and
 - Comprehensive (dealing with the whole ecosystem including all trophic levels). See also Essington & Pláganyi (2012, MSC Science Series).

- Where species are aggregated into trophic groups in ecosystem models, the degree of aggregation should adhere to the guidance provided in Fulton et al. (2003)⁵ that:
 - Aggregations do not include serially linked groups (predators and prey) and
 - That aggregations are not across species, age classes or functional groups with rate constants that differ by more than 2- to 3- fold. Where possible, information about trophic connection should be based on empirical evidence of trophic dependence.
- **Diet matrices**, which characterise the proportion of prey eaten by each predator in addition to the simple linkages between predators, may also be used. If diet matrices are used, they must also be constructed adhering to the guidance of Fulton et al (2003).
- In determining key LTL status, the **spatial scale** of the ecosystem that could be affected, and from which information should be derived, needs to be considered. This should generally correspond to the spatial distribution of the stock being fished, and could be broader in some instances (for example if the stock occurs within a well-defined spatial entity such as a gulf or regional sea). It will not necessarily correspond to the jurisdictional scale of the fishery. If the spatial scale of the ecosystem is considerably larger than the stock distribution, the potential impacts on predators of localised depletion would need to be considered.

Example:

In cases where key LTL stocks are identified by using total catch as a proxy for total biomass of the stock, this proxy needs to be scaled to the spatial extent of the stock and its predators. A low volume fishery in a major coastal upwelling system would be interpreted differently than one in a small embayment with several locally-dependent predators.

- Where the target stock or stock component under assessment is widely distributed and is present in more than one ecosystem, the assessment of sub-criteria i, ii and iii in paragraph [SA2.2.9a](#) in Annex SA of the CR should focus on the ecosystem containing largest abundance of the species.

The three sub-criteria in paragraph [SA2.2.9a](#) for identifying “key” LTL stocks follow the description of wasp-waisted ecosystems given by Cury et al. (2000, 2003)⁶ as being “typically dominated by only one, or at most a few” LTL species that transfer a very large proportion of the total primary production through the lower part of the food web, that account for the vast majority of predator diets and that control the abundance of both the prey and the predators of these LTL species. Guidance on assessing whether the each of the three sub-criteria are met is provided in the following sub-sections.

Teams should note that the MSC may, from time to time, modify the list of species in [Box SA1](#), where analyses indicate the consistency of other species with the criteria in paragraph [SA2.2.9b](#).

⁵ Fulton, E.A., Smith, A.D.M. and Johnson C.R., 2003. Effect of complexity on marine ecosystem models. *Marine Ecology Progress Series* 253: 1 – 16.

⁶ Cury, P., A. Bakun, R.J.M. Crawford, A. Jarre, R.A. Quinones, L.J. Shannon and H.M. Verheye (2000) Small pelagics in upwelling systems: patterns of interaction and structural changes in ‘wasp waist’ ecosystems. *ICES Journal of Marine Science* 57:603-619.

Cury, P., L. Shannon and Y.-J. Shin (2003) The functioning of marine ecosystems: a fisheries perspective. Pp103- 123 In *Responsible Fisheries in the Marine Ecosystem*, M. Sinclair and G. Valdimarsson (eds). FAO, Rome and CABI, Oxon UK.

Key LTL criterion i – Connectivity

This sub-criterion requires that the LTL stock is eaten by the majority of predators, as stated: “a large proportion of the trophic connections in the ecosystem involve this species, leading to significant predator dependency”.

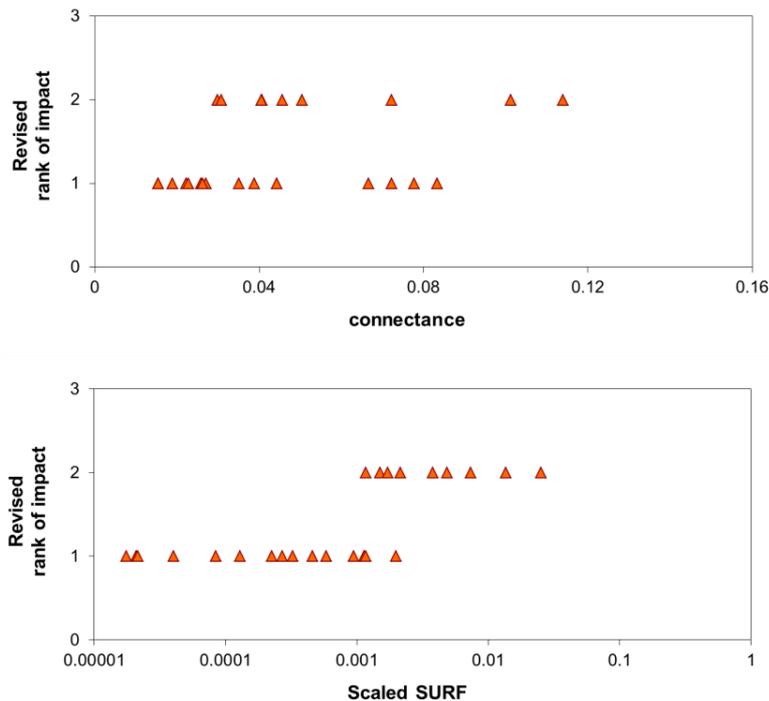
- In quantitative terms, food webs can be used to investigate connectance, which can be expressed as unweighted **Proportional Connectance** or the weighted **SURF index** (Supportive Role to Fishery ecosystems). SURF has the advantage that it is relatively insensitive to the grouping of predator and prey species; connectance is highly sensitive to them (Essington and Plaganyi, 2012 – MSC publication series).
- MSC has developed a spreadsheet which will calculate PC and SURF from a diet matrix. Many ecosystems have published diet matrices, including those that have had some basic ecosystem modelling undertaken such as ECOPATH. CABs and clients may request this spreadsheet from MSC.
- Proportional Connectance (PC) is calculated as follows, from a diet matrix that has n components, and only requires a knowledge of the interaction between groups, not the proportional diet fraction of each group.
 - The total connectance T in a diet matrix is the Number of all positive (non-zero) diet interactions between components (i.e., predator-prey).
 - The connectance C of a component is the total number of prey interactions plus the total number of predator interactions of that component calculated from the diet matrix.
 - Then the proportional connectance of prey *i* is $PC_i = \frac{C_i}{T}$
- **SURF** is calculated as follows
 - $$SURF_i = \frac{\sum_{j=1}^n (p_{j,i})^2}{T}$$
 - where p_{ij} is the diet fraction of predator *j* on prey *i* (the proportion of the diet of predator *j* that is made up of prey *i*).

Figure GSA3 shows the results, for key and non-key LTL species classified according to the MSC definition (as given in SA2.2.13): if, when fishing at $B/B_0=40\%$, no single ecosystem group is reduced by more than 70% of its B_0 , and no more than 15% of ecosystem groups are perturbed by more than 40% from their B_0) using the data in Smith et al (2011)⁷, of calculating connectance and SURF.

Figure GSA3: PC and SURF scores calculated from EwE ecosystem models presented in Smith et al (2011), plotted against their impact on the ecosystem: category 1 satisfies

⁷ Smith, A.D.M. et al., 2011. Impacts of Fishing Low-Trophic Level Species on Marine Ecosystems. www.scienceexpress.org. 21 July 2011

SA2.2.13a at $B/B_0 = 40\%$ and is classified as non-key LTL; category 2 fails SA2.2.13a and is classified as key-LTL



Based on the analyses illustrated in [Figure GSA3](#), the following should be assumed by assessment teams:

- Connectance values of less than 4% would normally indicate a non key-LTL stock; values of greater than 8% would indicate a key LTL stock.
- SURF values of less than 0.001 will normally indicate a non-key LTL stock. SURF values of greater than 0.005 will normally indicate a key-LTL stock.

In the intermediate zone, where the classification of the stock is uncertain, further qualitative evidence of predator dependency may be taken into consideration, e.g.:

- If the stock is important in the diets of many higher predators for much of the year ('importance' here might be shown by the species being the preferred diet of a predator, compared to other prey species that also occur in the diet depending on availability; or by the species having higher calorific value or other specific fitness, e.g., for the development of juveniles),
- If land-based colonies of predators (including seals, sea lions, penguins and other birds) are considered particularly dependent on this LTL stock, or
- If large aggregations of other species are known to gather to feed on this LTL stock.

In the absence of a credible quantitative model, assessing the percent of connections will require ecosystem-specific understanding of the food web connections in the whole ecosystem based on a comprehensive species list that identifies links for major prey and predators, particularly dependent predators of the LTL stock in question, and supported by the considerations presented in paragraphs above.

Key LTL criterion ii – Energy Transfer

This sub-criterion requires that “a large volume of energy passing between lower and higher trophic levels passes through this stock”;

- Argument to determine whether sub-criterion 1b is triggered may be based on 1) empirical data, 2) credible quantitative models, and/or 3) information about the relative abundance of the LTL stock in the ecosystem.
- Consumer biomass ratio is calculated as the biomass of the candidate key LTL stock, divided by the biomass of all consumers in the ecosystem (i.e., all ecosystem components that are not primary producers or detritus), i.e., $\text{Consumer Biomass Ratio} = B_{\text{LTL}}/B_{\text{consumers}}$.
- Model-based results suggest that any LTL stock that constitutes more than 5% of the consumer biomass in the ecosystem should be regarded as a key LTL stock.
- The importance of the size of a key LTL stock in determining whether there is a large volume of energy transfer through it will of course depend upon the size of the total energy in the ecosystem, and in the consumer biomass, as defined above.
- Although the size of the catch of a key-LTL stock is not directly indicative of its likely importance in energy transfer, nevertheless, in approximate terms catch size can be assumed to relate to ecosystem importance and may be used to support a plausible argument that a LTL species meets, or does not meet, criterion [SA2.2.13](#):
 - LTL stocks that are subject to small catches (<50,000 t average total catch from the stock over the last 5 years) by small scale fisheries will not normally be key LTL stocks. Catches less than this threshold may still indicate key LTL stocks in cases where they are taken from unusually small ecosystems.
 - The situation with LTL stocks that are subject to large catches (e.g., >100,000 t total catches from the stock over the last 5 years) in respect of key-LTL status is less easy to predict. CABs should, however, not assume that these fisheries are accessing non-key LTL stocks.

Key LTL criterion iii – Wasp-waisted-ness

The ‘wasp-waisted-ness’ sub-criterion requires that “there are few other species at this trophic level through which energy can be transmitted from lower to higher trophic levels, such that a high proportion of the total energy passing between lower and higher trophic levels passes through this stock”.

- Simple food webs will be sufficient to determine whether there are significant other functionally similar species (at a similar trophic level) to the candidate LTL stock.
 - Although for the candidate LTL species, the focus is on the adult component of the stock ([SA2.2.9.a](#), [SA2.2.9b](#)), the consideration of other species at the same trophic level should consider all life stages (including juveniles) of those species.
- Examination of catch statistics of other species of the types listed in [Box SA1](#) or [SA2.2.9.b.i](#) within the same ecosystem may also allow determination of whether there are few significant catches of other species at this trophic level.
 - In ecosystems where the catches of the candidate LTL stock are less than those of all other species at the same trophic level, the ecosystem may be regarded as not wasp-waisted and the candidate stock will not normally be a key LTL stock.

Example:

Sardine would be considered a key LTL species in the southern Benguela current system but not in the northern Humboldt system in its current state (as at 2010); if the Humboldt were to shift to a sardine-based rather than an anchovy-based system, it would once again become a key LTL species in that ecosystem.

As with other MSC guidance on ecosystem change (for instance relating to climate change, multi-decadal environmental cycles), CABs need to be aware of changes in ecosystem structure and productivity, and assess (in surveillance reports or in assessment / reassessment) the extent to which the fishery has taken these into account, for instance in the case of productivity by adjusting target/limit reference points, or in the case of ecosystem shifts such as above by reconsidering the species against the key LTL species definition.

GSA2.2.11–GSA2.2.16 Scoring stock status for key LTL stocks ▲

Estimates for B_0 referred to in SA2.2.12 and SA2.2.13 can be determined using credible single species or ecosystem models or from robust empirical data such as fishery independent surveys.

- See Smith et al (2011) for the justification of the impact levels required in SA2.2.13.b and the use of a default 75% B_0 target level for their achievement.
- In SA2.2.13.b, point i addresses broader “ecosystem-level” impacts, and point ii addresses individual species impacts.

GSA2.2.15 Scoring key LTL stocks based on fishing mortality rate (F) ▲

In the absence of robust estimates for B_0 , target fishing mortality rates that would achieve the appropriate target biomass levels can be adopted. Smith et al (2011) and the Lenfest task force⁸ found that exploitation rates about half MSY rates were required to limit the ecosystem impacts to the same levels obtained at the default 75% B_0 .

For key LTL species, the default expectations provided in GSA2.2.4 (for non-key LTL species) should be modified to reflect the higher biomass levels expected and the lower fishing mortality rates needed.

- At least a **60** score is justified if F is likely to have been **somewhat below F_{MSY} but not as low as 50% F_{MSY}** for at least one generation time of the species (or for at least two years, if greater).
- At least an **80** score is justified if F is likely to have been at **0.5 F_{MSY} or 0.5M** for at least two generation times (or for at least four years, if greater).
- A **100** score is justified if F is highly likely to have been **below 0.5 F_{MSY} or 0.5M** for at least two generation times (or for at least four years, if greater).

⁸ Pikitch, E., Boersma, P.D., Boyd, I.L., Conover, D.O., Cury, P., Essington, T., Heppell, S.S., Houde, E.D., Mangel, M., Pauly, D., Plagányi, É., Sainsbury, K., and Steneck, R.S. 2012. Little Fish, Big Impact: Managing a Crucial Link in Ocean Food Webs. Lenfest Ocean Program. Washington, DC. 108 pp. (see: <http://www.lenfestocean.org/foragefish>)

GSA2.2.16 Allowing for recruitment variability ▲

Environmental variability is generally high for fisheries based on key LTL species compared to non-LTL fisheries. In some cases, this makes biomass based reference points meaningless and better justifies the use of F-based management approaches.

GSA2.3 Stock Rebuilding PI (PI 1.1.2) ▲

Background

Where stocks are not regarded as ‘fluctuating around’ their target levels (B_{MSY} or higher levels for key LTL stocks) and they score less than 80 on PI 1.1.1, stock exploitation levels must be low enough to achieve stock rebuilding back up to the PI 1.1.1 SG80 level. The CR text does not refer to “formal recovery plans”, as in some jurisdictions this terminology carries specific legislative or regulatory meaning. Fisheries are instead expected to have “recovery strategies”, which may or may not be binding in a statutory context. Such recovery strategies are scored in the management component of Principle 1 (particularly PI 1.2.2). Here in PI 1.1.2, the material concerns are that an appropriate rebuilding timeframe is set, and that the exploitation rate and other factors confirm that rebuilding is likely to be achieved within that timeframe.

If PI 1.1.1 is scored lower than SG80, PI 1.1.2 must be scored. If PI 1.1.1 is rescored at SG80, PI 1.1.2 should be removed from the scoring of P1, regardless of whether any condition on the rebuilding timeframe has yet been met, and in this case such an unmet condition should be considered closed.

Scoring issue (a) - Rebuilding timeframes ▲

Where quantitative stock assessment information is used in scoring this PI, teams should note that stock rebuilding timeframes required in scoring issue (a) relate to the time required for the stock to recover from the current level to the B_{MSY} level (or a level regarded as ‘consistent with MSY’ where proxies are used).

The rebuilding timeframe that may be reasonably expected will depend on the life history characteristics of the species, but MSC requires that even very slow growing stocks should have rebuilding plans that aim for a maximum of 20 years. On this basis, it may be impossible for some stocks to achieve recovery targets in a five year timeframe because of the life history parameters of the species under assessment: growth rate; size or age at maturity or recruitment to the fishery; stock size or age composition; longevity; and, natural mortality, among other things. On the other hand, some very fast growing stocks may recover faster than one certification period (5 years) and for this reason an extension to 5 years is allowed for these stocks.

As allowed in the scoring of other PIs, CABs should apply the definition of generation time given in [Box GSA4](#).

GSA2.3.2 – GSA2.3.3 Timeframes for achieving conditions ▲

Teams should note that stocks that trigger rebuilding may be allowed one year to put rebuilding strategies and monitoring in place. In this case, the fishery should not be immediately failed if the SG60 level is not met in this first year. In fisheries where stock assessments and the development of management advice are not an annual event, the team may consider allowances of more than one year.

If PI 1.1.2 scores less than 80, due to a lack of evidence for rebuilding, the condition applied to develop such evidence should still be achieved within the normal maximum five year duration of the certificate (as required in [SA2.3.3](#)). While MSC's allowance for "exceptional circumstances" in FCR 7.11.8 may still apply to rebuilding of the stock (which may be constrained by the species biology), it should not apply here to the necessary reduction in exploitation rate (which is regarded as being under the control of management and not constrained by the species biology).

MSC wishes to avoid the situation that fisheries appear in the upper left corner of a 'Kobe plot', with high exploitation rates even when stock size is reduced. Teams should thus consider whether any condition on rebuilding could reasonably be achieved in less than the maximum five year period, e.g., on an 'accelerated' two year timescale. Fisheries in this situation should be expected to begin effective rebuilding (and thereby achieve the SG80 level for this PI) as fast as reasonably possible.

GSA2.3.4 Scoring fishing mortality rate as evidence of rebuilding ▲

Teams should note the requirement to explicitly consider levels of fishing mortality rate in this PI, where this information is available ([SA2.3.4](#)).

The MSC's expectation of rebuilding is that for most stocks, scores of 80 or 100 will require fishing mortality to be lower than F_{MSY} , as described in [SA2.3.4.1](#) and [2.3.4.2](#). The alternative allowance in [SA2.3.4.3](#) would apply only in exceptional circumstances where there is real demonstrated recovery in the stock even though F is not less than F_{MSY} . This may still occur in some years, for example, in HCRs where F is specifically used as a target rather than a limit, as described in the examples in Box GSA3.

It may also be temporarily acceptable following a series of recent high levels of recruitment due to good environmental conditions. In such cases, the "alternative clear evidence that the stocks are rebuilding" should include that the stock has increased in at least the last two years (or other period as used in the assessment of the fishery). Evidence of only one year/period of growth should not be accepted as sufficient evidence in these cases. The scoring rationale in these cases should thus include some understanding of why the stock is rebuilding even though F is higher than F_{MSY} .

Teams should give particular consideration to the level of fishing mortality in cases where environmental variability appears to be affecting the ability of the stock to recover.

In situations where climatic cycles (e.g., decadal-scale) are shown to be reducing the potential of the stock to achieve good recruitment, 80 or 100 scores may still be justified when fishing mortality rate is 'likely' or 'highly likely' below F_{MSY} and the expectation is that good recruitment will be restored when climatic conditions permit. Consideration should also be given to the target levels that are expected for rebuilding, consistent with [GSA2.2.7](#).

GSA2.4 Harvest Strategy PI (PI 1.2.1) ▲

Background

This PI scores the overall performance of the harvest strategy, particularly the way that the different elements work together to keep the stock at levels consistent with reference points.

Scoring Issue (a) – Harvest strategy design ▲

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;
- the information base and monitoring stock status and the responsiveness of the management system and fleet to stock status.

CABs should also consider whether there are issues that might compromise the effectiveness of the harvest strategy, such as fishing overcapacity caused by subsidies. If overcapacity exists as a result of subsidies, the management system should be robust enough to deal with this issue and still deliver a sustainable fishery in accordance with MSC Principle 1 & 2.

Assessing informal approaches against PI 1.2.1

Assessment of data-deficient fisheries against this indicator should consider how elements of the harvest strategy combine to manage impact, such that susceptibility is maintained at or below acceptable levels given the productivity of the species.

- The assessment should factor in the likelihood of changes within the fishery that could potentially lead to an increase in the risk of impact from fishing activity over time.
- Teams should further consider how elements of the strategy are combining to ensure that the fishery is moving in the desired direction or operating at a low risk level and that qualitative or semi-quantitative objectives are being achieved.
- There should be evidence that the expected objectives are being achieved. Evidence may be demonstrated through local knowledge or research.
- CABs should determine the extent to which there is a feedback and learning mechanism to inform the harvest strategy on an ongoing basis. Depending on the scale of the fishery this could be through informal stakeholder processes that are based on local knowledge of the fishery or any other less subjective review process.

GSA2.4.1 Interpretation of terms ▲

As used in S11.2.1b at the 100 level, an ‘evaluation’ may range from a subjective stakeholder process in small scale/data deficient (SS/DD) fisheries to quantitative Management Strategy Evaluation (MSE) as appropriate to the fishery.

‘Testing’ at the 80 level in S11.2.1b can include the use of experience from analogous fisheries, empirical testing (for example practical experience of performance or evidence of past performance) and simulation testing (for instance using computer-intensive modelling such as Management Strategy Evaluation (MSE)). Testing and evaluation in Scoring Issue (b) at the Harvest Strategy level should consider the full interactions between different components of the harvest strategy, including the HCRs, use of information and the assessment of stock status. A score of 100 for this S11.2.1b requires a broader evaluation than that considered in the evaluation of the robustness of HCRs in S11.2.2b.

GSA2.4.3 Shark finning ▲

Background

At its December 2011 meeting, the MSC Board of Trustees resolved that shark finning shall not be undertaken within MSC certified fisheries.

The intent of scoring issues (e) in Pls 1.2.1, 2.1.2 and 2.2.2 is to provide a mechanism for scoring a fishery on the level of certainty that a CAB has that shark finning is not taking place. These scoring issues intend to assess the arrangements that are in place to ensure shark finning is not taking place. It is designed as a combination of regulations and external validation.

Regardless of a fishery's performance against these Pls, the CAB should not certify or maintain the certification of a fishery when there is objective verifiable evidence that indicates shark finning is taking place. Objective verifiable evidence could be any documented statement of fact based on observations, measurements or tests which can be verified.

GSA2.4.5 – GSA2.4.7 ▲

Fins naturally attached and fin: carcass ratios

The MSC considers that a policy requiring the landing of all sharks with fins naturally attached is the most rigorous approach to ensuring that shark finning is not occurring. However, the MSC recognises that in some fisheries this may be practically difficult to achieve when sharks are destined for processing and utilisation, and therefore also recognises that landing fins and other shark parts separately, including as meal, may be allowed if adequately regulated and observed.

Ratios vary within species and fishing fleets. Recent studies on 50 species of shark highlighted a variation of mean species specific fin to carcass ratios of 1.1% to 10.9% (Biery & Pauly, 2012). Accurate ratios for each species are essential for any meaningful monitoring of catches (Cortés & Neer, 2006; Ariz et al., 2008). Ratios should consider cutting practices, wet-fin-mass or dried fin mass to carcass ratio, and whether the carcass is wet weight or dressed (processed) weight. If fins have been dried and the carcass has been dressed at sea, then conversion factors should be used to calculate the ratios. Where there is no scientific consensus or lack of scientific evidence, the CAB should allow use of the ratio approach and require to land fins naturally attached.

Where reference is made to the requirement for fins to be naturally attached (FNA) to the body, in order to facilitate freezing and storage the fishery could partially cut the fins, including for the purposes of draining blood to avoid ammoniation, and fold them around the carcasses. FNA includes leaving the fins attached by just a small piece of skin so that the sharks can be packed at sea efficiently, and that the fins can be fully removed from the shark at the dock without having to thaw the shark. However, fins should be attached to a substantial part of the shark, not just some vertebrae.

Regulations

Regulations refer to regulations governing the management of sharks including but not limited to prohibiting shark finning, such as ratified RFMO conservation measures, national or international MOUs or agreements, implementation of NPOAs on sharks, national legislation regulating the management and catch of sharks, etc.

Processing and utilisation

Processing should involve the transformation and the retention of a substantial part of the shark apart from the fins. Retention of a minor body part, such as teeth, should not be counted as processing. The definition for processing includes “highly utilised”, meaning that a major part of the animal is retained during the processing (either on board or once landed).

External validation

The certification requirements mention levels external validation by way of indicating the types of confidence that the MSC would require to demonstrate that shark finning is not occurring.

The assessment team should use their expert judgement concerning the actual validation methods available and their ability to confirm the likelihood that shark finning is not taking place (SA2.4.4.1). However, the following guidance is available:

- At **SG 60** “some external validation” should be understood to indicate a validation level equivalent to a nominal observer coverage of 5% of effort, although the CAB may accept other rates and alternative measures/evidence (e.g., dockside monitoring) with sufficient justification that the same scientific outcome (likely confidence that finning is not taking place) is delivered.
- At **SG 80** “good external validation” should be understood to indicate a validation level equivalent to a nominal observer coverage of 20% of effort, although the CAB may accept other rates and alternative measures/evidence with sufficient justification that the same scientific outcome (highly likely confidence that finning is not taking place) is delivered.
- At **SG 100** “comprehensive external validation” is required. This gives consideration of the continuity of data collection, precision and accuracy of information, and any bias, etc, that is capable of supporting the measures in place given the level of precaution that is implicit in the measures and the ability of the measures for detecting any changes.

In cases where alternative evidence and alternative observer coverage is used, the CAB should ensure that it meets the same level of confidence as the default observer coverage. CABs should assess the adequacy of the methods used, particularly with respect to the precision, accuracy and bias (statistical and observational bias) of the method and its ability to provide externally verifiable data (see also GSA3.6.4).

Additional/alternative measures/evidence sufficient to ensure shark finning is not taking place could be effective electronic monitoring (e.g., using VMS-linked video monitoring with a high percentage coverage of fishing activity), dockside verification of catches where bodies and body parts are required to be landed together by law, and various combinations of these elements. Dockside monitoring can for instance, validate ratios between shark and the fins at the point of landing.

The percentage of on board observer coverage generally refers to coverage of total fishing effort of all vessels in the UoA. CABs may accept other expressions of the percentage coverage but should ensure in any case that the sampling strategy provides a reasonable representation of the catches of the UoA as a whole. In order to establish whether observer data or other monitoring mechanisms are representative of the activity of the UoA during a year, and can be relied upon to have detected representative encounters with sharks, CABs could seek evidence for the management system having examined the on board observer data, or other data, for consistency with the reported/landed/etc. catches of sharks.’ This could be done, for example, by comparing the on board observer reports to the logbooks.

When sharks are processed on board the number of animals taken should be recorded as specified in the reporting template. Given that after processing sharks are no longer whole, the CAB can use a 'conversion factor', to calculate the equivalent live weight based on the dressed (processed) weight.

GSA2.5 Harvest Control Rules & Tools PI (PI 1.2.2) ▲

Background

This PI assesses the harvest control rules (HCRs) and actions that management takes in response to changes in the fishery and/or changes in status in relation to reference points.

HCRs are the arrangements by which a fishery expects to achieve the stock status outcomes expressed in PI 1.1.1. They are defined as the pre-agreed rules and management actions that will be taken in response to changes in indicators of stock status with respect to explicit or implicit reference points, and MSC expects these elements to be part of HCRs. The values adopted for such reference points are critical to the performance of the HCR, and CABs should ensure that the interaction between the rules of the HCR and the reference points is part of their assessment.

With the removal of the reference points PI in version 2.0 of the standard, parts of the guidance originally applied to the Reference Points PI 1.1.2 in CR v1.3 have now been moved and adapted to more clearly apply in this PI.

For low trophic level species the target and limit reference points need to take into account the ecological role of the stock for the fishery to score 60 or above under PI 1.1.1. The harvest strategy, control rules, information requirements and assessment also need to be consistent with this distinction for low trophic level species.

There are conceptual differences in the reference points that may be involved in scoring PI 1.1.1 and PI 1.2.2. This is because fisheries may use different reference points for measuring stock status (outcome), and as triggers in the HCRs. Dowling et al (2011a, b) ⁹ provide examples of such different types of reference points within the conceptual framework of HCRs and harvest strategies used by the MSC. A fishery that uses an explicit B_{MSY} reference point as a target for the fishery biomass may, for example have trigger reference points for adjusting F at values of biomass either at B_{MSY} , or above or below B_{MSY} . Other examples are available in Dowling et al (2011) and in some MSC fisheries (e.g., see Tristan da Cunha and Maine lobster). The focus in this PI is thus on the reference points used in a fishery to trigger changes in management actions, and how they work in combination to achieve the outcomes required in PI 1.1.1.

Scoring Issue (a) – HCR design and application ▲

This scoring issue focuses on the assessment of the design and plausibility of HCRs and management tools to control exploitation of the whole stock(s) under assessment.

HCRs and/or management tools should be based on plausible hypotheses about resource dynamics and be reasonable and practical, meaning that those measures possess a substantial likelihood of success. The basis for plausibility and practicality of design should be considered in relation to the scale and intensity of the fishery, for instance utilising empirical information; relevant science; or model based approaches such as MP and MSE.

⁹ Dowling, N.A., Dichmont, C.M., Smith, A.D.M., Smith, D.C. and Haddon, M., 2011a. *Guidelines on developing harvest strategies for data-poor fisheries*. CSIRO.

Dowling, N.A., Haddon, M., Smith, D.C., Dichmont, C.M. and Smith, A.D.M., 2011b. *Harvest Strategies for Data-Poor Fisheries: A Brief Review of the Literature*. CSIRO.

The HCRs should be scored against their ability to deliver the levels expressed in scoring issue (a) (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.
- At the **80 level**, HCRs should also ensure that the stock is likely to fluctuate around a B_{MSY} level. Testing may show that this is achieved by the inclusion of a B_{MSY} consistent reference point as a trigger in the HCRs (such as an inflection in a ‘hockey stick’ form) at a point that would deliver B_{MSY} in the long term.
- At the **100 level**, greater certainty is required. Fisheries with HCRs that target stock levels above B_{MSY} (e.g., B_{MEY}) should also be regarded as at least meeting the 80 level and projections in the fishery may show that the HCR would likely achieve the higher 100 score by fluctuating more above than around B_{MSY} .

HCRs will usually include some form of dynamic rule, requiring that a change of some sort will be made in response to a fishery indicator moving above or below one of the trigger reference points. In lightly exploited fisheries, it may be that some reference points are set to trigger changes in data collection or assessment approaches, as certain thresholds are reached (see Dowling et al, 2011a).

HCRs are often applied on a frequent basis, such as with the annual setting of TACs or effort restrictions. Such HCRs respond dynamically to the monitoring data from the fishery with regular adjustments to input/output type management measures. In data-poor fisheries which are managed without such input/output controls, management may comprise only technical measures such as size limits, gear restrictions, closed seasons and closed areas. In these cases, the specific terms of the technical measures are usually set and fixed for a relatively long period of time (several years), based on occasional strategic stock assessments, that are shown to deliver defined target and/or limit reference points. Such an arrangement may be regarded as equivalent to a dynamic HCR operating over a longer time scale in cases where some indicators are monitored to confirm that the HCRs are delivering the intended targets for the stock.

At the 80 level in scoring issue (a), ‘well-defined’ HCRs in these cases would be expected to explicitly include the conditions under which the technical measures in the fishery would be expected to be revised in the future.

Example:

Relatively sedentary bivalves often have fishery management trigger points based on population densities collected through systematic surveys, where these index densities are established based on the species population dynamics and the inherent productivity of the habitat and environmental conditions. There may be no formal stock assessment but yield is calculated on a proportion of the observed biomass and the harvested fraction determined on empirical evidence from historical catches and their consequences. While such arrangements can work, teams should note that HCRs based on taking a constant percentage of the year’s estimated biomass should not be regarded as meeting the requirement of avoiding the PRI unless some lower threshold is defined.

The requirement that an HCR reduces exploitation rates as the limit reference point is approached should not always be interpreted as requiring the control rule to deliver an exploitation rate that is a monotonically decreasing function of stock size:

- Any exploitation rate function may be acceptable so long as it acts to keep the stock above a limit reference point that avoids possible recruitment failure and attempts to

maintain the stock at a target reference point that is consistent with B_{MSY} or a similar highly productive level.

- This outcome includes the requirement that the HCR should act to cause stocks to rebuild to the target reference point when they are below it; maintenance of a stock at a level just above the limit reference point would not be acceptable.
- A reduction of exploitation rate may not always mean that the control rule requires a reduction in "total" exploitation rate, but instead could for instance involve reducing exploitation rate on parts of the stock (e.g., by age or sex).
- Reductions in exploitation rate are assumed to primarily refer to reductions in catches and effort, and not to gear modifications unless these have the effect of reducing catches/effort.

As noted in the guidance on PI 1.1.1, HCRs may include both explicit and implicit reference points.

Examples:

If a management strategy is based solely around a target reference point, the HCR, when combined with the target reference point should ensure that the stock remains well above the PRI and ensure that the exploitation rate is reduced as this point is approached. This is an implied limit reference point.

Equally, a management strategy based solely around a limit reference point should imply that there is a target reference point close to or at B_{MSY} (or some other measure or surrogate that maintains the stock at high productivity), and at a level that is well above the limit reference point.

Generally understood' HCRs at SG60 vs 'well-defined' HCRs at SG80

HCRs should be regarded as 'well-defined' in the sense required to achieve an 80 score when they exist in some written form that has been agreed by the management agency, ideally with stakeholders, and clearly state what actions will be taken at what specific trigger reference point levels.

HCRs should be regarded as only 'generally understood' as required to achieve a 60 score in cases where they can be shown to have been applied in some way in the past, but have not been explicitly defined or agreed.

GSA2.5.2 – 2.5.5 Scoring 'available' HCRs at SG60 ▲

In scoring issue (a), and the requirements given in SA2.5.2 to SA2.5.5, the expectation is that 'available' HCRs may meet the SG60 level in cases where stock biomass has not previously been reduced below the B_{MSY} level or has been above it for a sufficiently long recent time, and it is 'expected' that the management authority will introduce HCRs for this species in the future if needed.

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).

As an alternative, teams may provide a rationale under clause 2.5.3.b in cases where there is some sort of arrangement in place that clearly requires that management will put HCRs in

place as and when the fishery reaches some pre-defined trigger level within the vicinity of B_{MSY} . Such arrangements would normally relate to lightly exploited fisheries that are still in the development stage, but should be explicit in requiring action at some defined point. Although potentially driven by information and triggers, such arrangements are different to the actual HCRs as they relate to the development of the **HCRs** themselves while the HCRs define how **management measures** will be adjusted in response to changes in fishery status.

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).

In cases where the stock has not yet been reduced and 'available' HCRs are scored as meeting the 60 level, the condition assigned to this PI may allow longer than the normal five year time period for delivery. While there will be advantages in designing and putting into place a 'well-defined' HCR during the certification period, it may also be acceptable to do this over a longer time period, for example if other conditions are being delivered first. This allowance is made on the basis that the stock remains abundant and the criteria given in SA2.5.2 are still met. As soon as these criteria are no longer met, the fishery will need to have at least 'generally understood' HCRs in place to score 60.

Stocks that change status and thereby fail to meet the SA2.5.2 criteria during the course of a certificate will need to put HCRs in place (in either a 'generally understood' sense or 'well defined'). Given the specific timeframes indicated in SA2.5.2, HCRs (either 'generally understood' or 'well defined') should be in place before a stock declines below B_{MSY} . Similar to the situation with the rebuilding PI (section GSA2.3) fisheries should be allowed one year to put HCRs in place, so that the fishery need not be immediately failed if the SG60 level is not met in this first year. If such fisheries fail to put in place either 'generally understood' or 'well defined' HCRs within one year, they should be suspended by the CAB as not meeting the SG60 level.

Scoring Issue (b) – Scoring uncertainty in the HCRs ▲

In scoring issue (b), teams must assess how well the HCRs are likely to function when the unexpected happens in the future. The scoring guideposts reflect the degree of confidence there is in the HCR performance in relation to risks, caused by both known and unknown factors. Known factors include observation and process errors which are often accounted for in stock assessments. Unknown factors may include unpredictable effects from climate, environmental or anthropogenic non-fishery related factors, which could, for example, lead to periods of low recruitment or growth, high natural mortality or migration. These and other changes to the population dynamics may not have been fully accounted for in the stock assessment or projections. Another important reason why there may be limited confidence in a HCR is where it has not been fully agreed by stakeholders, and it is uncertain whether the fishing community will comply with the HCR. This last issue is important to ensure HCRs are not only theoretical rules on paper, but are actually applied in practice.

The requirement that the control rules and/or management actions are designed to take into account uncertainty can be supported by testing. Testing can include the use of experience from analogous fisheries, empirical testing (for example practical experience of performance or evidence of past performance) and simulation testing (for instance using computer-intensive modelling such as MSE).

Although it may generally be the case that limit reference points are set at the point that reproductive capacity starts to be appreciably impaired, for some fisheries, especially those for small pelagic species and annual species where there the stock recruit relationship is very steep, management may choose to set a limit reference point above this level. Where

this results in more precautionary management, it may assist the fishery in achieving the 80 or 100 level for scoring issue (b).

HCRs in small scale fisheries may still achieve high scores if uncertainties are well considered. Simple HCRs linked to reliable indices of stock status may thus score highly on this issue without management strategy evaluations.

Scoring Issue (c) – Evaluating the effectiveness of HCRs (SA2.5.6 – SA2.5.7)



In the third scoring issue, teams must review the ability of the tools associated with the HCRs to achieve the exploitation levels. Such tools would include management measures like total allowable catches (TACs) and fishing limits, and arrangements for sharing TACs between participants in the fishery, including between states in shared stock fisheries. The examination here may consider the overall history of effectiveness of the tools used in the fishery (i.e., their ability to achieve the desired exploitation rates and biomass levels) as well as the current status.

Section SA2.5.6 requires that teams examine the current exploitation levels in the fishery, as part of the evidence that the HCRs are working. Evidence that current F is equal to or less than F_{MSY} should usually be taken as evidence that the HCR is effective. Current F levels greater than F_{MSY} may also sometimes be accepted in cases where stock biomass is currently higher than B_{MSY} or where stock assessment information is comprehensive, and it is appropriate to treat F_{MSY} as a target reference point (see Box GSA3).

Teams should be confident in these cases that any such higher levels of F are not likely to lead to overcapacity in the fishery or to create a situation where B is likely to fall below a level at which it is regarded as 'fluctuating around B_{MSY} '. Lower levels of F should be expected when biomass is reduced, consistent with the scoring of the rebuilding PI. In any case, teams should justify how the current levels of fishing mortality are consistent with maintaining the stock fluctuating around a target level consistent with (or above) B_{MSY} .

Teams may also make allowance for the gradual adjustment of fishing mortality rates down to appropriate levels in cases where the pace of change is limited to avoid severe socio-economic impacts in a fishery. In these cases, projections of stock status should confirm that the expected future adjustments in F will still lead to fluctuations around MSY levels within a reasonable timescale.

Where proxy indicators and reference points are used in the fishery instead of explicit estimates of F and F_{MSY} (as allowed in SA2.5.7), higher scores should be assigned where greater confidence is provided by the proxy information, similar to the scoring of PI 1.1.1. Where higher scores are justified by the use of two or more proxy indicators, they should be independent of each other and also reasonably be expected to be proxies of the quantity of interest (such as mean fish size in the case of exploitation rates). The team should present a rationale for how the proxies conform to these principles.

As with the case of using proxies for scoring stock biomass in PI 1.1.1, it may sometimes be argued that one good proxy is better than two or more weak proxies.

Examples: 60, 80 and 100 SG levels

Examples of how the 60, 80 and 100 SG levels may be justified in these situations are given below:

- At least a **60 score** may be justified if **one proxy** indicates that overfishing is not occurring;
- At least an **80 score** may be justified if **one or more** proxies indicate that it is **likely** that overfishing is not occurring. In this case, the extra confidence may be due to the availability of a second proxy indicator, or when a minimum 70% probability level can be assigned to the single indicator used (as compared to the SG60 level where this probability level may not be demonstrated); and
- A **100 score** may be justified if **two or more** proxies indicate it is **highly likely** that overfishing is not occurring.

Assessing informal approaches to HCRs

In informally managed fisheries, CABs should assess the extent to which there are management tools and measures in place that are consistent with ensuring that susceptibility of the target species to removal is no higher than that which would cause the risk to the target species to be above an acceptable risk range. Measures could be spatial, temporal, or changes to gear overlap.

Assessments should also consider measures in place to respond to changes in the fishery, for example, by reducing the susceptibility of target species when the fishery is not heading in the direction of its objectives.

Metapopulations

Scoring issues (b) and (c) require that teams assess whether or not the selection and design of harvest control rules takes into account the main / wide range of uncertainties.

Uncertainties relating to the metapopulation structure should be specifically addressed by the assessment team. Teams should note the descriptions of different types of metapopulations in Section G7.

4.7.

GSA2.6 Information Monitoring PI (PI 1.2.3) ▲**Background**

This PI addresses the information base for the management of the target stocks. The information and monitoring required for the management of stocks should only include that which is needed to inform the harvest strategy, HCRs and control tools.

The intent of SG60 is that while only a limited amount of information may be available and regularly monitored this would normally be considered sufficient to support the HCR under the most likely stock hypothesis.

Information is required:

- To undertake assessment of stock status;
- To inform the design of a harvest strategy and effective HCRs;

- For the effective operation of harvest control tools.

GSA2.6.1 Information categories ▲

The following guidance is offered on information categories:

- **Stock structure** could incorporate information describing the distribution and geographical range of the stock, the relationship of the geographical range to the harvest control, and the age, size, sex and genetic structure of the stock.
- **Stock productivity** could incorporate maturity, growth, natural mortality, density dependent processes, the stock recruit relationship and fecundity.
- **Fleet composition** could incorporate information on associated effort by gear type/method of capture, including fleet characteristics in both targeted and non-targeted fisheries taking the species. The general assumption is that information is required for the stock as a whole, but better information would usually be expected from the fishery unit that is being assessed.
- **Stock abundance** could incorporate information relating to absolute or relative abundance indices including recruitment, age, size, sex and genetic structure of the stock. Reflecting the guidance on surrogate measures under PI 1.1.1, the requirement for 'stock abundance' information at SG60 and SG80 may be met by the use of surrogate indicators that provide an adequate proxy for stock abundance.
- **Fishery removals** could incorporate information describing the level, size, age, sex and genetic structure of landings, discards, illegal, unreported, unregulated, recreational, customary and incidental mortality of the target stock by location and method of capture. Information is required for the stock as a whole, but better information would usually be expected from the fishery being assessed.
- **Other data** may include environmental information such as temperature, weather and other factors that may influence fish populations and fishing.

See clause [GSA3.6.4](#) for more guidance on information PIs and discards data collection methods.

The intent behind the consideration in SG100 that additional information should be available that may not be directly relevant to the current harvest strategy, is that the information monitoring system should take into account information relevant to a wider set of possible stock hypotheses than addressed by the current harvest strategy. This is essentially “future proofing” the management system against alternative hypotheses and changes in the system.

Scoring issues (b) and (c) – Scoring fishery removals ▲

The distinction between scoring issues (b) and (c) for PI 1.2.3 at SG80 relates to the relative amount or quality of information required on fishery removals.

Scoring issue (b) relates to fishery removals specifically by those vessels covered under the unit of assessment which need to be regularly monitored and have a level of accuracy and coverage consistent with the harvest control rule.

The reference to ‘other’ fishery removals in scoring issue (c) relates to vessels outside or not covered by the unit of assessment. These require good information but not necessarily to the same level of accuracy or coverage as that covered by the second scoring issue.

Metapopulations

Understanding dispersal pathways and population connectivity is important for devising effective harvest strategies and therefore information related to the metapopulation structure should be specifically addressed by the assessment team.

Information that could be relevant to the assessment would include:

- life cycle of the species, including its spatial distribution and temporal distribution
- identification of local populations and the extent to which they are connected, and function as either sinks or sources, reflecting the dispersal of both larvae and adult
- the role of oceanographic features or any other mechanisms in controlling larval dispersal and connectivity
- existence of genetic studies comparing local populations
- variations in population structure and demographic parameters between sources and sinks

GSA2.7 Assessment of Stock Status PI (PI 1.2.4) ▲

Background

This PI considers how the fishery assesses information to provide an understanding of stock status and the effectiveness of the harvest strategy. Some harvest strategies assess stock status using empirical indicators and do not require use of quantitative assessment models. In such cases, the assessment PI will be scored relative to the robustness of that indicator (which may also have contributed to the score for the Information PI).

This PI refers to stock assessments but in some circumstances, particularly under SG100, it may be useful to consider if MP/MSE approaches were used to test the robustness of the stock assessment to uncertainty and alternative hypotheses.

For some harvest strategies stock assessment methods may not be model based but based on stock status relative to empirical reference points (e.g., catch rate, density, survey abundance, among other things), and decision rules may be constructed of rules using these indices rather than analytical assessments. Other harvest strategies may utilise complex analytical models.

Metapopulations

Where several or many local populations exist within a metapopulation, it is unlikely that full stock assessments would be done annually for each local population. The degree of self-recruitment and demographic connectivity among sub-populations should dictate the specific assessment required to allow for responsible and sustainable harvest.

Assessment teams should specifically take into consideration the appropriateness of the stock assessment in relation to the metapopulation structure.

Teams should also assess whether or not the stock assessment identifies and takes into account major sources of uncertainties related to the metapopulation structure.

GSA3 Principle 2

GSA3.1 General requirements for Principle 2 ▲

Background

The Principle 2 assessment is divided into five components; which are considered to cover the range of potential ecosystem elements that may be impacted by a fishery (See [Table GSA2](#) below).

Table GSA2: Components of Principle 2

Component	Intent
Primary Species	Managed, in-scope (e.g., fish and shellfish) species. Primary species will usually be species of commercial value to either the UoA or fisheries outside the UoA, with management tools controlling exploitation as well as known reference points in place. In addition, the institution or arrangement that manages the species (or its local stock, see below) will usually have some overlap in jurisdiction with the fishery in the UoA.
Secondary Species	Secondary species include fish and shellfish species that are not managed according to reference points and birds/mammals/reptiles/amphibians (all species that are out of scope of the standard) that are not ETP species. These types of species could in some cases be landed intentionally to be used either as bait or as food for the crew or for other subsistence uses, but may also in some cases represent incidental catches that are undesired but somewhat unavoidable in the fishery. Given the often unmanaged status of these species, there are unlikely to be reference points for biomass or fishing mortality in place, as well as a general lack of data availability.
ETP Species	Endangered, Threatened or Protected Species
Habitats	The chemical and bio-physical environment, including biogenic structures, where fishing takes place.
Ecosystem	Broader ecosystem elements such as trophic structure and function, community composition, and biological diversity.

In general terms, the impacts of the fishery on the different P2 components are assessed as below:

- Primary species, secondary species and habitats are assessed for the direct impacts of fishing.
- ETP species are assessed for both direct and indirect impacts.
- The Ecosystem component is assessed for indirect impacts.

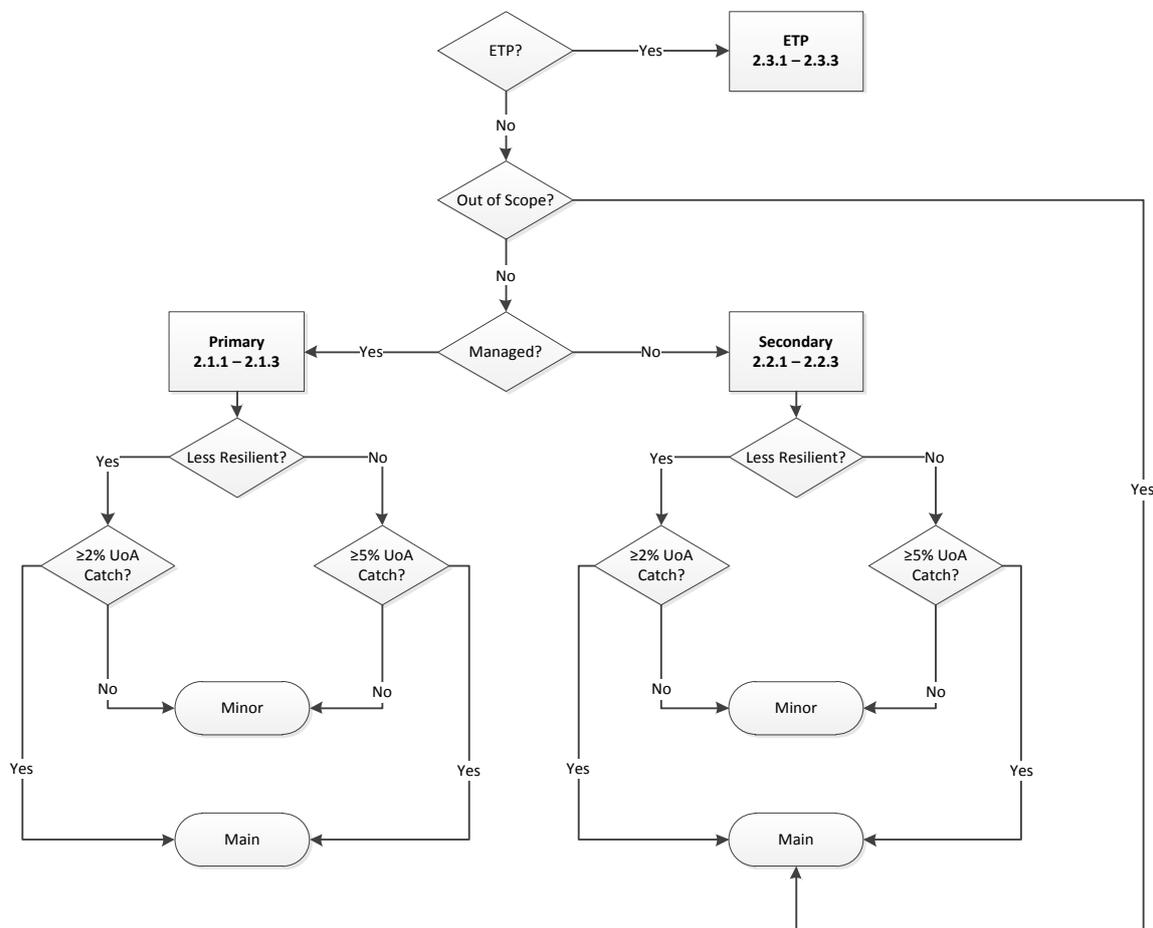
Direct impacts in this context include the actual capture of a species by fishing, and other types of direct mortality, such as following discarding or interactions with the fishing gear. Indirect impacts include situations where the removal of the target species reduces its availability as prey for a predator species, and a range of ecosystem level changes as described in section [GSA3.16](#).

GSA3.1.1 – 3.1.4 Designation of P2 species ▲

In Principle 2, the MSC use the term ‘species’ in scoring issues and requirements within primary, secondary and ETP PIs. As in Principle 1 (see Box GSA3), it is the MSC’s intent that the term ‘species’ as used in Principle 2 could mean an entire species or only a stock or population of a species, as appropriate to the species and the context of the fishery in assessment. As an example, a large pelagic fishery in the Atlantic that takes a P2 catch of a certain tuna species would only include a P2 assessment on the Atlantic tuna stock, and need not consider any clearly separate Pacific stock. Assessment teams may thus score the primary, secondary and ETP PIs either as species or as stocks depending on their overlap with the fishery.

The decision tree outlined in [Figure GSA4](#) provides an overview of the intent of the separation between primary, secondary and ETP species. Teams may use the decision tree as a guide on the designation of P2 species, but should primarily be guided by the definitions of ‘primary’, ‘secondary’, ‘ETP’ and ‘less resilient’ in the FCR and GFCR.

Figure GSA4: Decision tree to assist teams in the designation of P2 species components



Examples: Primary species

- A species with a full analytical stock assessment in place that is managed as a whole stock according to a scientifically established TAC.
- A species that does not have a full analytical stock assessment, but where established proxies for the PRI are in place and all fisheries impacting that stock are managed to maintain the stock above that proxy reference point.
- A species with a multi-jurisdictional distribution that is recognized to be below a scientifically established limit reference point, but only one jurisdiction has set up a recovery strategy which all fisheries operating in that area have to adhere to. The UoA targeting that species is subject to a different management authority, which has no management measures in place, but since the species distribution overlaps with an area that would classify that species as primary, the UoA also has to classify it as a primary species.

Examples: Secondary species

- A species managed according to a precautionary TAC that has no analytical or empirically derived stock assessment in place and the stock status in relation to the PRI is unknown.
- A species with some scientific advice on stock status indicating a limit reference point as well as a recommended TAC, but where this advice has not yet been adopted and operationalized by the relevant management authorities (when implemented by the authorities, such species would instead be a primary species).
- A species classified as out of scope (bird, reptile, amphibian, mammal) that is not recognized by national or international authorities as an ETP species.

Example: ETP species

- A species listed on CITES Appendix I, even though the national management authority does not recognize it as an ETP species (note also GSA3.1.5).

GSA3.1.5 ETP ▲

The team should consider all ETP species that are vulnerable to being impacted by the fishery in the assessment area.

In situations where data on interactions with ETP species is are limited, the assessment team should take a more inclusive approach (i.e., all ETP species in the geographic area).

GSA3.1.5.2 Binding International Agreements ▲

When referring to international agreements, by “binding” the MSC means that the international legislation is binding on the parties to the agreement. Neither the flag state of the UoA, nor the state in which fishing takes place, need be a signatory to this agreement for it to be applicable to MSC certified UoAs.

Species listed under CITES Appendix 1 shall be considered ETP species, unless it can be shown that the particular stock of the CITES listed species impacted by the fishery under assessment is not endangered.

Example:

For example, if a species is listed in CITES Appendix 1 because it is endangered in the Pacific, and the fishery under assessment is catching the Atlantic stock which is not endangered, then the stock does not have to be assessed under the ETP component.

Several of the Agreements listed in FCR section SA3.1.5.2 have been developed under the aegis of the Convention of Migratory Species (CMS). The CMS is an intergovernmental treaty under which legally binding global or regional Agreements can be developed. Parties to the CMS are required to 'endeavour to provide immediate protection for migratory species included in Appendix I of the CMS' and to 'endeavour to conclude Agreements covering the conservation and management of migratory species included in Appendix II'.

Agreements are adopted to reflect the direct conservation needs of species and the requirements of regions (Sant et al, 2012). Species listed in any of these shall be classified as ETP for the purposes of an MSC assessment. Given that the Agreements have a limited and well-defined scope, both in terms of the number of species included as well as the geographic region covered, there is therefore no 'unless it can be shown...' clause here as there is for those species classified as ETP by their inclusion in Appendix 1 of CITES.

GSA3.1.6 Unwanted catch ▲

Where a UoA has a management plan, some species and sizes may be considered and designated to be 'unwanted catch' (including through using terms such as 'non-target', 'bycatch' or 'discards' in the plan). If not designated, unwanted catch of species are those that are not covered under the plan. Unwanted catches of species may also be designated as catch that is prohibited in that fishery.

Unwanted catch may also include the part of the catch that has been thrown away or slipped where the components of that catch may not survive after release.

See [GSA3.5.3](#) for a further description of unwanted catch.

GSA3.1.8 Unobserved mortality ▲

The total impact of the fishery on all components in P2 needs to include observed and unobserved fishing mortality:

Observed mortality includes:

- Catches;
- Catches that are thrown away, including slippage.

Unobserved mortality can include, but is not limited to:

- Illegal fishing and/or unregulated catches;
- Animals that are injured and subsequently die as result of coming in contact with fishing gear;
- Animals that are stressed and die as a result of attempting to avoid being caught by fishing gear

- Ghost fishing (mortality of free living or benthic organisms arising from entanglement in lost fishing gear; see [Box GSA7](#) below):

Box GSA7: MSC Intent: “Ghost fishing” and impacts from gear loss

MSC Intent: “Ghost fishing” and impacts from gear loss

The Food and Agriculture Organisation of the UN (FAO) define ghost fishing as the term used for lost or abandoned fishing gear that continues to catch fish¹⁰.

The MSC Principles and Criteria for Sustainable Fishing include Criteria that relate to ghost fishing and gear loss, including that the fishing operation shall:

- Make use of fishing gear and practices designed to avoid the capture of non-target species and non-target size, age, and/or sex of the target species); minimise mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive (3.B.12);
- Implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas (3.B.13); and
- Minimise operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc. (3.B.15).

These Criteria are operationalised in the MSC standard (default tree) throughout Principle 2. For example, when determining the fishing operation’s impact on primary, secondary and ETP species, assessment teams are required to consider unobserved, in addition to observed fishing mortality and impacts (SA3.1.8). The guidance associated with this clause stipulates that unobserved fishing mortality can include (but is not limited to) ghost fishing ([GSA3.1.8](#)). In version 2.0 of the FCR, assessment teams are required to consider whether fisheries review measures to minimise mortality of unwanted catch. This also includes consideration of unobserved mortality, such as that caused by ghost fishing.

The impacts of gear loss on habitats are considered under the Habitats components. In particular, there is Guidance on the Habitats Management PI (2.4.2) that indicates that in order for a fishery to score a 100, a management strategy should be in place even for gears that do not regularly contact benthic habitats since gear loss or unexpected seafloor impacts could occur ([GSA3.15](#)). An example is provided on what would be expected of a management strategy for a pelagic longline fishery where gear loss is considered ([Table GSA8](#)).

In addition, in the Ecosystem PIs, the team need to consider how the fishery impacts the wider ecosystem structure and function. Indirect effects of lost gear and other operational waste that are not considered directly under the primary, secondary and ETP PIs are considered here.

GSA3.1.9 Terms and interpretation ▲

Throughout the P2 section a number of keywords and phrases are used. The aim of Table GSA3 is to provide further guidance to [Table SA8](#). Specifics relating to application of these

¹⁰ <http://www.fao.org/fishery/topic/14798/en>

terms and probability levels in relation to each component are further discussed under the different PIs for each component.

Table GSA3: Further explanation and examples of Principle 2 Phrases (see Table SA8)

Term	Definition and discussion
Biologically based limits	<p>The PRI is commonly used as a single-species biologically based limit, but many proxies are also acceptable to this level, depending on the information that is available and the nature of the ecosystem feature of concern (for example, percent of an area impacted by the UoA).</p> <p>The wider role of the component in the ecosystem is important in identifying biologically based limits, which may for example be modified so as to avoid excessive depletion of dependent predators.</p> <p>Alternative concepts to defining biologically based limits include determining a minimum viable population size (MVP), which is the number of individuals required to have a specified probability of persistence over a given period of time (Shaffer, 1987). This method is used in the IUCN Red List for small and range-restricted populations.</p> <p>Another concept relating fishery-induced mortality to an indication of stock/population status, developed for use with cetaceans (Wade, 1998) and subsequently adapted for seabirds (Dillingham & Fletcher, 2011; Richard & Abraham, 2013), is Potential Biological Removal (PBR). PBR is defined by NOAA as the maximum number of animals, not including natural mortalities that may be removed from stock while allowing that stock to reach or maintain its optimum sustainable population.</p>
Broadly understood	<p>Primary, secondary and ETP species' status are broadly understood when there is general knowledge of the impact of the type of UoA on a species/species group, although it may not be specific to the unit of assessment (UoA).</p> <p>Habitat distribution is broadly understood when there is basic knowledge of the types and locations of habitats.</p> <p>The key elements of the ecosystem are broadly understood when the main features of the ecosystem and their major inter-relationships can be specified.</p>
Does not hinder	<p>This should be interpreted as not materially or significantly impeding recovery or rebuilding, and relates to the potential impact of the UoA rather than an observed change in the absolute status of the component.</p> <ul style="list-style-type: none"> • If there is a formally planned recovery then the management of the UoA(s) should be consistent with that plan and should not prevent the planned recovery from being achieved in the intended timeframe. • If there is no formally planned recovery then the UoA(s) would permit recovery on a timeframe that is consistent with the natural dynamics of the species. <p>Sometimes a species is depleted or otherwise experiencing very low productivity for reasons that are unrelated to the impacts of the UoA (e.g., highly unfavourable environmental conditions, effects of contaminants on reproduction, etc.). Due to such factors, there is never a guarantee that a species will recover promptly, even in the absence of fishing. The key concern is thus whether or not the UoA could</p>

Term	Definition and discussion
	<p>prevent a potential recovery from occurring. Hence it is appropriate to evaluate this component relative to the impact of the UoA on the species (or all MSC UoAs where appropriate), but not actually require evidence that the status of the species is improving. This is different to the treatment of target species in P1, where low status would preclude certification irrespective of the cause of that low status</p>
If necessary	<p>“If necessary” is inserted in some Management PI scoring issues to indicate that if the UoA does not have any impact on a certain component (e.g., species), then no specific rationale need be given in order to achieve the relevant SG level. For example, if there are no “main” primary species, then a management strategy would not be required at SG60 or SG80. “If necessary” does not appear in the Management PI scoring issue (a) at SG100, meaning that in order to score 100 a management strategy should be in place even if there is no interaction of the UoA with that component.</p>
Information is adequate	<p>Information is adequate if, given consideration of the continuity of data collection, precision of estimates, comprehensiveness of information and any bias, etc. it is:</p> <ul style="list-style-type: none"> • Capable of supporting an outcome score with relevant confidence levels, or • Capable of supporting the management strategy given the level of precaution that is implicit in the strategy and the requirements of the strategy for detecting changes in either impact or outcome status of affected components (e.g., species).
Measures / Partial Strategy/ Strategy/ Comprehensive Strategy	<p>“Measures” could include the closure of an area that was primarily been put in place to avoid the catch of juvenile target species and enhance target species sustainability, but also has a beneficial effect on the unwanted catch of sensitive species such as other juvenile finfish. For a “partial strategy”, specific measures may not have been designed to manage the impact on that component specifically, but if such a measure/ measures are effective in assisting the UoA to achieve the SG80 level for the primary or secondary species Outcome PI then this could be considered as a management measure under the primary or secondary species Management Strategy PI.</p> <p>A “strategy” could include voluntary or customary arrangements, agreements or practices, codes of practice (if they can be demonstrated to be working).</p> <p>For a “comprehensive strategy” to be achieved information is required to ensure and continue to confirm that the UoA has no impact upon that component.</p>
MSC UoAs and the assessment of cumulative impacts	<p>To ensure that the cumulative impact of all MSC fisheries is within sustainable limits, a UoA assessed against standard v2.0 may need to consider the combined impact of itself and other overlapping UoAs. This determination will include other UoAs assessed against earlier versions of the CR (e.g., v1.3).</p> <p>UoAs assessed using default trees prior to CR v2.0 would not have to make this evaluation.</p> <p>Teams should refer to Annex GPB for additional guidance on the harmonisation of cumulative impacts of MSC UoAs, particularly noting</p>

Term	Definition and discussion
	<p>the language on flexibility in the setting of milestones for a condition and avoiding the creation of unrealistic conditions.</p> <p>Teams should note that the ‘overlapping UoAs’ are assessed at different levels depending on which PI is evaluated. For P2 primary species, teams need to evaluate whether the cumulative impact of overlapping MSC UoAs hinders the recovery of ‘main’ primary species. For secondary species, cumulative impacts only need to be considered in cases where two or more UoAs have ‘main’ catches that are ‘considerable’, defined as a species being 10% or more of the total catch. For ETP species, the combined impacts of MSC UoAs needs to be evaluated, but only in cases where either national and/or international requirements set catch limits for ETP species.</p> <p>All of the requirements for cumulative impacts for species are applicable to their respective Outcome PIs. For habitats, in contrast, cumulative impacts are evaluated in the management PI (2.4.2). The requirements here aim to ensure that vulnerable marine ecosystems (VMEs) are managed such that the impact of all MSC UoAs does not cause serious and irreversible harm to VMEs.</p>
Objective basis for confidence	<p>At the SG60 level in the P2 Management PIs, expert knowledge can be acquired from diverse sources, including studies that may have been conducted in the area although not for the purpose of certification, studies of the same or similar species or ecosystems in other places, established ecological theory and modelling, and community or experiential knowledge.</p> <p>At the SG80 level, an “objective basis of confidence” may exist where information augmenting the expert knowledge has been collected in a sound manner, but might be opportunistically collected rather than collected as part of a systematic monitoring program or a research project targeted on the specific component. How extensive the more specific information is may vary, but it should be appropriate to the scale and intensity of the UoA.</p> <p>At the SG100 level, information should come from systematic monitoring and/or research. This does not mean that information exists on everything, particularly for the Habitats and Ecosystem components, but information is reliable and complete for all the major points of interaction between the UoA and component, to a level of detail appropriate to the scale and intensity of the UoA.</p>

Term	Definition and discussion
Serious and irreversible harm to “structure and function”	<p>Serious or irreversible harm to habitat includes changes in the structure and/or function (e.g., biological diversity), abundance, and disruption leading to regime shifts that imply that recovery to 80% of the unimpacted level may not automatically occur even in the absence of fishing. This includes the loss or extinction of habitat, depletion of key habitat-forming species or associated species to the extent that they meet criteria for high risk of extinction, and significant habitat alteration that causes major change in the structure, function, and/or diversity of the associated species assemblages.</p> <p>Although the intent of the MSC is that biological diversity be included in this definition, we recognise that current limitations to the methods available for measuring biological diversity mean that surrogates are often used such as species diversity (including parameters commonly used to measure this, like species richness and evenness) and abundance.</p> <p>Serious or irreversible harm to the ecosystem includes many of the concepts presented for habitats (which are usually also ecosystems) but additionally includes trophic cascade, depletion of top predators and key prey species in ‘wasp-waisted’ food webs, severely truncated size composition of the ecological community to the extent that recovery would be very slow due to the increased predation of intermediate-sized predators, permanent changes in the species diversity of the ecological community caused by direct or indirect effects of fishing, and change in genetic diversity of species caused by selective fishing and resulting in genetically determined change in demographic parameters.</p>

GSA3.2 General requirements for outcome PIs ▲

Background

The outcome PIs assess the current status of each component and whether the fishery is posing a risk of serious or irreversible harm to the component or hindering its recovery.

Explicit targets may not be appropriate or available for all of the components, in some cases, because there is no scientific or general consensus on appropriate targets. While performance can sometimes be scored in relation to targets, the generic performance requirements relate to the increasing confidence and safety margins by which serious or irreversible harm may be avoided, including through the management tools, measures and strategies that are in place.

Table GSA4 shows MSC’s intent for the maintenance of each P2 component in relation to sustainability levels.

Table GSA4: MSC outcome expectations for each P2 component

Component	Outcome expectation
Primary	The intent of the SGs is that a fishery is managed such that the stock biomass is maintained above the point at which recruitment could be impaired (PRI). This reflects the language used for PI 1.1.1.
Secondary	The SGs refer to being 'within' biologically based limits. These limits are equivalent to the PRI concept used for P1 and primary species, but may take many forms and may be expressed as upper or lower limits in relation to the index that is being measured.
ETP	The intent is that ETP populations and stocks are 'within' national and international limits and not creating unacceptable impacts.
Habitats	The SGs refer to the changes caused by the UoA that fundamentally alter the capacity of the habitat to maintain its ecological structure and function or to recover from the impact.
Ecosystem	Changes caused by the fishery that fundamentally alter the capacity of the ecosystem to maintain its key structure and function or to recover from the impact. This may also be interpreted as seriously reducing the ecosystem services provided by the component to the fishery, to other fisheries and human uses.

The components of P2 may be subject to human impact from sources other than the assessed fishery. For example primary or secondary species may be target species in other fisheries, while habitats and ecosystem processes may be impacted by coastal zone or other development or introduced species.

If the component status is low, for whatever reason, then the operative issue for the majority of the SGs in P2 assessments is then whether the UoA is hindering recovery as defined in [Table SA8](#) and [Table GSA3](#). The assessment in these cases is based on the 'marginal contribution' that the UoA makes to the status or recovery of the component under consideration. If the UoA is not the root cause of human impacts on the component then actions of the UoA cannot redress the situation. However in any event the UoA is required not to hinder recovery or rebuilding.

For primary, secondary and ETP species, the language above applies to all scoring issues at the SG 60 level. However, at the SG80 level, the team needs to consider the cumulative impact of any other MSC UoAs where applicable. Please see [Table GSA3](#) under 'MSC UoAs and the assessment of cumulative impacts' for an overview of how each species PI is evaluated differently in this regard. Please also [GSA3.4.6](#) and [GSA 3.10](#) for more guidance on how to evaluate the cumulative impact of primary/secondary species and ETP species respectively.

GSA3.2.3 Interpretation of likelihood levels ▲

The terms in [SA3.2.3](#) may be interpretable either:

- qualitatively (e.g., through analogy with similar situations, plausible argument, empirical observation of sustainability and qualitative risk assessment) or,
- quantitatively (e.g., through measured data from the relevant fishery, statistical analysis, quantitative risk assessment and quantitative modelling).

The specific language on what level of information needs to be available to meet the associated probability at each scoring issue will be addressed in the information PIs for each component. The team should also look to the guidance on the information adequacy for

each PI for a further overview on the levels of information required in order to determine the probabilities listed in [Table SA9](#) in [SA3.2.3](#). For example, the guidance on information adequacy for primary species can be found in [GSA3.6.3](#).

GSA3.3 General requirements for Information PIs ▲

Background

The requirements in the Information PIs are framed in terms of information adequacy. The information used by the assessment team to score the UoA may come in many forms (e.g., written, verbal, photographs, first-hand accounts) and come from different, potentially competing sources (e.g., the client, fishers, community members, non-governmental organisations, government agencies).

The team will need to exercise their expert judgement about these different forms and sources of information and should investigate whether or not they can be supported by credible independent sources.

For some forms of information, support can be derived from published scientific literature that refers directly or indirectly to the subject of interest, and further support may be obtained from the client or stakeholders or by first-hand observations. The assessment team will need to be satisfied that information is objective, has been generated through acceptable scientific methods, and can be independently verified.

When presented with information that may not be verifiable, the team may find it useful to “triangulate opinions” (see also [GSA3.6.3](#)), cross-checking statements made by people against other opinions and perspectives held by other stakeholders. A range of triangulated opinions will offer different perspectives, highlight diverse views, or potentially reveal vested interests. These opinions can also help to verify or authenticate information, or challenge others’ assumptions or biases. Triangulation may not reveal the one true answer; it may simply yield a fuller, more complete understanding when all the information is brought together. Ultimately, the team will need to use its expert judgement and make decisions based on the best available information, independent of its source.

In addition to the terms defined in [Table SA7](#) and the examples in [GSA3](#), throughout the P2 Information PIs, certain statistical terms are used, including: precision, coefficient of variance (CV), bias (statistical), variance, accurate, qualitative data and quantitative data. These terms have been added to the [MSC-MSCI Vocabulary](#), appended to this document.

GSA3.4 Primary Species Outcome PI (PI 2.1.1)

GSA3.4.1 Approach to the assessment of main and minor species ▲

The MSC requirements in P2 apply particularly to those species that are defined as ‘main’ species, according to their importance in the fishery, or by virtue of their low resilience (see specific criteria in the CR and below). Requirements are specified for such ‘main’ species at each of the 60, 80 and 100 SG levels. Additional separate requirements are specified for the remaining ‘minor’ species, but only at the 100 level. Similar arrangements are specified both for primary and secondary species and for habitats, and for the Outcome, Management and Information PIs for each component. No such distinction is made for the ETP component, where all species are scored at 60, 80 and 100.

GSA3.4.2 Designation of 'main' species ▲

When considering species for designation as 'main'; in addition to the listed requirements in the CR, teams should also give consideration to the temporal trend in catches and use a precautionary approach to determine whether species shall count as 'main'.

This should include taking into account the variability of the catch composition over the last five years or fishing seasons and recognizing that some species might be 'main' some years but not in others. Depending on data availability, teams may choose a different length of the time series, but a rationale should be provided in all cases of the method chosen. The overall intent when designating 'main' species, is that there should be a good understanding of the long-term average catch composition of P2 species of the UoA before the PCDR is released; and further, that teams are confident that the species compositions, as well as their respective catch volumes, are unlikely to change over the lifetime of the certificate.

In all cases teams may still designate species as main, even though it falls under the designated weight thresholds of 5% or 2%, as long as a plausible argument is provided as to why the species should warrant that consideration.

For example, a stock might be in such a poor state, that all impact by the UoA is important enough to consider, even in cases where the catch proportion is so low that it would normally be classified as a minor species (also see [GSA3.4.2.2](#) below).

The mortality of unwanted catch should be incorporated into the determination of main/minor categories and the assessment of Outcome and Management PIs, irrespective of the fact that it is unwanted.

Bait species should be subject to the same Main filters as other species. When bait species are purchased from outside the UoA, the calculation of Main is still in relation to the volumes of total catch of the UoA, not the volumes of total weight from the fishery that the bait is purchased from. The latter volumes could, however, be used as part of the rationale as to whether or not the amount of bait purchased by the UoA is hindering/not hindering recovery of the bait-stock. This also means that if bait is purchased and it is main, teams need to assess the management and information PIs for the bait fishery for all scoring issues at the SG 60 and 80 levels. Although this might present a challenge in some cases, the MSC expectations are that all aspects of the fishery need to be sustainable, which include bait. Therefore, rationale needs to be presented that even purchased bait comes from well-managed and healthy stocks.

Main primary species should also include any LTL species that are currently in a low abundance regime and not regarded as 'key' but may be expected to increase again in future to the point of becoming a key LTL species.

Shark fins are considered to have high commercial value. Thus, when a fishery trades shark fins, the shark should be considered a main species, even when sharks comprise less than 5% of the catch.

In cases where the catch percentages are unknown or too uncertain to make a determination on which species are main, a qualitative information-gathering process should be used and documented to determine whether the catch of the species by the UoA comprises more than 2%, 5% or 10% of all species by the UoA. Teams should be precautionary in their classification of main and minor species. This implies that more species might be considered main unless the team provides rationale to justify otherwise. This might for instance be the case for fisheries that need to use the RBF methodology and/or have very low sample sizes so that the standard deviation is really high.

GSA3.4.2.2 Designating less resilient species as ‘main’ at 2% ▲

The ‘Main’ threshold for less resilient species is set at a lower 2% of the total catch of the UoA by weight, because the risk of overfishing these species is inherently greater.

Teams should note that less resilient species should be assessed as such based on their life history characteristics and the risk to the stock from anthropogenic activities, not the actual impact of the UoA on the stock. The latter is assessed instead under the respective Outcome PIs.

As the levels of credible information needed to assess the intrinsic resilience of a species will be of varying quality and consistency, a wide range of source materials may be used. Scientific literature and other sources of material specific to the species and region under assessment are normally the most applicable.

In addition, the productivity part of the PSA may be used as both a precautionary and robust method of quickly determining the intrinsic resilience of a species, in cases where it scores either low or medium productivity (SA3.4.2.2.a.i).

In cases where the intrinsic resilience is high but the species is still at risk for other reasons, investigating species declines, population size, and extrinsic threats could here be considered.

For instance, the current abundance of the population may affect natural resilience if depensation effects are apparent and impair natural reproductive ability.

The parameters used in determining a Productivity score can be found on FishBase.org for most fish species. See Annex PF for full details on the PSA analysis.

The assessment team may also consider the spatial distribution of the species as well as the degree of spatial overlap with commercial fishing operations to determine:

- Whether the species is at risk of being locally depleted in the assessment area or;
- If the species has only a limited distribution, so that it is likely to be more severely affected by fishing pressure or;
- If the species is part of a widely distributed and highly migratory population, the cumulative impacts on the population may be greater as well as more difficult to account for.

GSA3.4.3 Post Capture mortality ▲

Teams should interpret very low post capture mortality as no less than a 90% survival rate. This should be proven by scientific evidence, independent observer coverage, tagging studies or similar information.

In cases where scientific evidence is not available for the particular fishery, but there are studies pertaining to similar fisheries, these can also be used, with appropriate rationales provided. In this regard the following document might be helpful: <http://nsrac.org/wp-content/uploads/2012/08/EU-discard-survival-short-study-version-001.pdf>.

GSA 3.4.4 Exceptionally large catches and main species ▲

In considering whether a species should be treated as 'main', CABs should take account of the relative catches of both target and the P2 species and determine whether the risk to the population of the impacted P2 species is significant enough to warrant a designation as 'main'. In the absence of full information, CABs should regard a catch by the UoA of 400,000mt of the target species as being 'exceptionally large'.

GSA3.4.6 MSC UoAs collectively not hindering recovery ▲

If a species is below the point where recruitment might be impaired, the second part of the clause in scoring issue (a) 'the UoA does not hinder recovery':

- At **SG 60** refers only to actions that the UoA can take in order to ensure that this outcome is met.
- At **SG 80**, in contrast, the impact of all MSC UoAs with that species as main needs to be considered, to ensure that recovery of the stock is not being hindered.

Teams should note at SG80 that the recovery of a species in P2 that is below a PRI or a biologically based limit is only required to levels above the PRI or biologically based limit, and not to the MSY or equivalent target levels required in P1 (as specifically referred to in PI 1.1.2 on stock rebuilding). P1 and P2 set critically different bars in this regard.

The text in this clause and its associated scoring issues require teams to evaluate whether a species below the PRI is actually recovering or if either the over-arching management strategy or a specific strategy employed by UoA(s) allows for a species to recover, even in the absence of recovery at the time of assessment. Although this determination can be reached using a combination of factors as outlined in SA3.4.6, teams may find it useful to first evaluate whether recovery of a species below the PRI is actually happening on a stock level, as evidenced by a demonstrably increasing trend in biomass. Where direct evidence from time series estimates of stock status is not available, proxy approaches may be used, including reference to fishing mortality levels and the use of simulation studies. In a very general sense, if fishing mortality for the entire stock – **not** just the marginal fishing mortality of the UoA – is less than F_{MSY} (the fishing mortality that would deliver maximum sustainable yield) the recovery of the stock can reasonably be expected to not be hindered. Although this determination will hold true in most cases, the extent to which total F is below F_{MSY} may in some cases need further consideration to ensure that rebuilding objectives are likely to be achieved. Simulation studies which combine information on recent and expected F levels, stock size and recruitment etc. may also be used to confirm that the stock is expected to recover, and thus that the strategy can be regarded as 'demonstrably effective'.

If a species below the PRI has an overarching recovery strategy in place, with effort controls set on total fishing mortality that are adhered to, an 80 score may also be achieved where evidence exists that the fishing mortality caused by all MSC UoAs is within the limits set by the recovery strategy in place for the species. This intent is also reflected in Table GSA3 under the definition of "does not hinder".

If there is no evidence of recovery as outlined above, by either evaluating stock biomass or total fishing mortality, SA3.4.6d allows an 80 score in cases where the proportion of combined catch by all relevant MSC UoAs is effectively not hindering recovery. In other words, in cases where total fishing mortality is **not** below F_{MSY} , teams need to evaluate whether the marginal fishing mortality caused only by the relevant MSC UoAs is material to the stock's ability to recover. This could be determined in a practical way by examining likely population trajectories if all the other fisheries reduced their catches to zero (i.e., the only

catches were being taken by the fishery under assessment). Since this will often be difficult to determine, MSC allows that the UoA's catch in proportion to the total catch of a stock may be used as a reasonable proxy of whether that UoA on its own or cumulatively with other UoAs, could be considered to be hindering recovery.

To illustrate this approach, even if the total catch of a species is clearly hindering recovery, UoA catches of less than 30% of the total catch of a species may not normally be influential in hindering a recovery in a marginal sense, i.e., nothing the UoA does would be likely to change the situation. On the other hand, catches of more than 30% might be influential, such that if the UoA took action to reduce its catches, the stock might well start to recover. A judgement on whether the UoA is hindering recovery will depend not only on the proportion of catch, but on the overall level of F that is causing the problem. In some cases, it might be more useful to simply assess the marginal F by the UoA in terms of the weight of catch removed in relation to the overall abundance of the stock, rather than in relation to the total catches. In this regard, investigating if the UoA's impact is more pronounced on certain size classes of the stock, e.g., only juveniles may also be warranted, as the actual impact of the UoA on the biomass of the population might then be different as opposed to if only mature adults were targeted. In making the overall evaluation on whether the UoA's stock removals are hindering recovery, teams may also find it useful to evaluate the overall resilience of the species as outlined in SA and [GSA3.4.2.2](#), taking into account the spatial distribution and evaluating e.g., if the species is at risk of being locally depleted etc. (see [GSA3.4.2.2](#)).

Teams should note that the impact of a UoA should here be assessed in terms of stock removals and the marginal F of the UoA and the percentages listed here should therefore not be confused with the percentages used to designate 'main' species, which are based on the proportion of a species as part of the total catch of the UoA ([SA3.4.2](#)).

Although SG80 only makes reference to being above a point of recruitment impairment, there is a requirement at SG100 that primary species are at biomass levels consistent with MSY. Primary species will often be taken in multi-species complexes. In a multi-species fishery context, the target levels of biomass or fishing mortality for some species that would be acceptable at SG100 may be different from that usually applied to a single species, although in all cases should result in primary species having a low risk of serious or irreversible harm.

Teams should also refer to Annex GPB for additional guidance on the harmonisation of scores and conditions when evaluating the cumulative impacts of MSC UoAs.

Determining the point of recruitment impairment (PRI) and the use of proxies

Teams should refer to the Principle 1 guidance in [GSA2.2.3.1](#) relating to the point of recruitment impairment (PRI) for additional help on the interpretation of this term, including the use of proxy reference points.

Recovery strategies differing between UoA jurisdictions

There may be instances where stocks below the PRI have a distribution across multi-jurisdictional boundaries (shared, straddling, HMS, high seas non-HMS stocks) but there are no comprehensive management efforts in place set to manage and recover the majority of the stock complex across all boundaries. Instead separate parts of the stocks may only be governed through regional management measures and separate UoAs impacting the same stock may thus have to comply with separate strategies for their respective jurisdiction.

In these cases and other applicable situations, where a demonstrably effective strategy between MSC UoAs needs to be in place, the different jurisdictional strategies do not have to be aligned and harmonized between UoAs in order to meet this requirement at SG80, but the intent is instead to evaluate whether the separate strategies together achieve the

outcome that recovery of the species is not hindered by those MSC UoAs. If not, teams should require some alignment of mitigation processes between UoAs.

Examples: UoAs in different jurisdictions

Examples of such a case would be where separate jurisdictions set different landing limits on the same depleted species, where e.g., one UoA would have to comply with a requirement to release all catches alive and another might have an allowance to only land a small amount each year. Teams would here have to evaluate the validity of each separate strategy, calculate the combined mortality caused by each UoA as described in the language on 'do not hinder' and make a determination on whether these two strategies combined sufficiently constitute a demonstrably effective strategy to not hinder recovery".

GSA3.4.7 Consideration of efforts to minimise the mortality of unwanted catches ▲

The intent of this clause is to clarify that where there is unwanted catch as defined in SA3.1.6 and associated Guidance ([GSA3.1.6](#)), the efforts of the UoA to minimise the mortality of this catch are taken into account by the team in the Outcome, Management and Information PIs (see [Box GSA8](#)).

The team should also take into account any changes or lack of changes to the status of the unwanted species when alternative measures are not implemented. For example, if a fishery does not implement alternative measures because there are none or because they are cost prohibitive, the team should still note whether the catch or mortality of unwanted catches decreases, stays the same or increases. Such consideration may occur either at full assessment, or at surveillances depending on the timing of reviews and the implementation of mitigation measures in the fishery.

Example:

For example, a UoA undertakes a review of measures to minimise the mortality of the unwanted catch for a species. Based on this review (it is shown that the measures have been effective in similar fisheries and the costs are not prohibitive), the UoA implements the measures. The existence of this review and the implementation of the measures are scored in the Management PI using SA3.5.3 and its sub-clauses.

The adequacy of information to evaluate the effectiveness of the measures, including any reduction of unwanted catch, e.g., lower catch rate, is scored in the Information PI, using [SA3.6.4](#) and associated guidance.

This information on the reduced catch rate of the species may improve certainty that a species is above the PRI/biologically based limits or, if below PRI/biologically based limits, form part of a strategy to ensure that the MSC UoAs do not collectively hinder recovery of this species. It is this that the team should consider when scoring SI (a) of the Outcome PI. A statement describing any improvements and whether they change the degree of certainty or prevent the UoA from hindering recovery of a species should be included in the scoring rationale.

GSA3.5 Primary Species Management Strategy PI (PI 2.1.2) ▲

Background

The intent of the P2 Species Management PIs (2.1.2, 2.2.2, 2.3.2) is to assess the arrangements in place to manage the impact that the UoA has on the P2 species to ensure that it does not pose a risk of serious or irreversible harm to them (or, in the case of ETP, that the UoA complies with any national or international requirements for protection of the species). The SGs contain a mixture of requirements for either measures or strategies to be in place (see [Table SA7](#) and Section [GSA3](#)). Also, it is to encourage the development and implementation of technologies and operational methods that minimise mortality of unwanted catch where it occurs.

The arrangements in place to manage impacts on the species may include measures to address both wanted and unwanted catch (see [Figure GSA4](#) and [Box GSA8](#) below). With respect to unwanted catch, measures may include (FAO, 2011):

- Input and/or output controls;
- Improvements of the design and use of fishing gear and unwanted catch mitigation devices;
- Spatial and temporal measures;
- Limits and/or quotas on unwanted catches;
- Bans on throwing away or slipping catch that create an incentive to reduce unwanted catch, provided that the unwanted catch cannot be released alive;
- Measures to increase survivorship of unwanted catch that is thrown away or slipped;
- Incentives for fishers to comply with measures to manage and/or reduce mortality of unwanted catch.

In these PIs, CABs should also consider incentives that might compromise the effectiveness of the management strategy meeting P2 outcomes, such as fishing overcapacity caused by subsidies. If overcapacity exists as a result of subsidies, the management system should be robust enough to deal with this issue and still deliver a sustainable fishery in accordance with MSC Principle 2. If the management system is not robust enough to deal with overcapacity caused by subsidies, a condition should be set in accordance with 7.11 against the relevant management PI (see [GSA2.1](#) for consideration of incentives in P1).

Box GSA8: MSC intent on unwanted species and habitats

The MSC intent on reducing fisheries' impacts on unwanted species and on habitats

Prior to the release of CR v2.0, the MSC Certification Requirements did not adequately take into account the MSC Principles & Criteria (Ps&Cs) in relation to bycatch, namely that fisheries should “make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimise mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive” (Criterion 3B.12).

In addition, FAO (1995), states that “selective and environmentally safe fishing gear and practices should be further developed and applied, to the extent practicable, in order to maintain biodiversity and to conserve the population structure and aquatic ecosystems and protect fish quality. Where proper selective and environmentally safe fishing gear and practices exist, they should be recognized and accorded a priority in establishing conservation and management measures for fisheries.”

Because there are currently no internationally-accepted definitions of bycatch and discards (FAO, 2011), the MSC has used the term ‘unwanted’ catch of species. The MSC definition of unwanted catch has been adapted from part of the description of ‘bycatch’ in FAO (2011); it is the part of the catch that a fisher did not intend to catch but could not avoid, and did not want or chose not to use.

In order to operationalise the intent of criterion 3B.12 in the MSC Ps&Cs and the statement from FAO (1995), changes in the P2 Species PIs in CR v2.0 have been made with the following intent:

- a. To motivate fishers to continually “think smart” about their impact on the environment (species and habitats); both in delivering the sustainable impact most efficiently, and continuing to reduce their impact beyond that
- b. To balance this desire with efficiency by not spending a lot of money and time generating only marginal improvements.

To achieve this for species, a new scoring issue has been added to the P1 Harvest Strategy (PI 1.2.1) and P2 Species Management PIs (PI 2.1.2, 2.2.2, 2.3.2) requiring fisheries to continually review alternative measures to encourage the development and implementation of technologies and operational methods that minimise mortality of unwanted catch or ETP species, taking into account the practicality of the measures, their potential impact on other species and habitats and on the overall cost of implementing the measures.

Fisheries need to either review alternative measures that are shown to minimise mortality of the species or species group in question ([SA3.5.3](#)). Fisheries need also to consider alternative measures to reduce impacts on habitats. Fisheries should take account of the potential for both positive and negative impacts of alternative measures on species and habitats (refer to [GSA3.14.2](#)) when considering whether such measures should be implemented.

Alternative measures should avoid capture of the species in the first place or increase its survivability if released. Alternatively, in the case of in-scope species, they could utilise the unwanted catch in some way so that it would no longer be ‘unwanted’. If there are no unwanted species, the scoring issue on reviewing alternative measures does not need to be scored in that PI.

The language used in the scoring issue is based on FAO (2011), which provides management planning guidelines for all significant sources of fishing mortality in a fishery, and FAO (1995). FAO (2011) presents requirements for management actions pertaining to bycatch and discards, which include:

- Reviewing effectiveness of existing initiatives to address bycatch and discard problems
- Reviewing potential effectiveness of alternative methods to address the bycatch/discard problem

In addition, the MSC's intent is that the efforts of the UoA to minimise the mortality of this unwanted catch are taken into account by the team in the Outcome and Information PIs. Information on the effectiveness of the measures, including any reduction of unwanted catch, e.g., lower catch rate, should be scored in the Information PI ([GSA3.6.4](#)). This information on the reduced catch rate of the species may improve certainty that a species is above the PRI/biologically based limits or, if below PRI/biologically based limits, form part of a strategy to ensure that the MSC UoAs do not collectively hinder recovery of this species. Teams are required to consider this when scoring the Outcome PI ([SA3.4.7](#)).

References

FAO.1995. *Code of Conduct for Responsible Fisheries*. Rome: FAO.

FAO.2011. *International Guidelines on bycatch management and reduction of discards*. Rome: FAO.

Scoring issue (a) Management strategy in place ▲

The different types of management arrangement (measures, partial strategy, strategy) referred to in this scoring issue (and referenced in scoring issues (b) and (c)) are clarified in Table SA7 and Table GSA2 of this document, and relate to the management undertaken by the UoA.

Scoring issue (c) Management strategy implementation ▲

Scoring issue (c) on management strategy and implementation should also take into consideration any alternative measures that have been implemented by the UoA if it meets SG80 or 100 under scoring issue (e) (see [SA3.5.3](#) & [GSA3.5.3](#)).

GSA3.5.1 -Scoring issue (d) Shark finning ▲

Scoring issue (d) is only scored where the primary species is a shark, regardless of whether it is wanted or unwanted catch. See [GSA2.4](#), guidance on PI 1.2.1 to score SI (e) related to shark finning.

Scoring issue (e) Review of alternative measures ▲

When assessing this scoring issue, CABs are expected to review evidence to determine whether the client (UoA) has undertaken a review of the potential effectiveness and practicality of alternative measures to minimise mortality of unwanted catch of main species, in order to achieve the SG60 level. This evidence could be, for example, a summary document listing information and measures reviewed along with an analysis of the measures and their appropriateness for the UoA, or the minutes of a meeting which has considered alternative measures.

GSA3.5.1 'if necessary' ▲

If the UoA has no (or negligible: see below) impact on this component, scoring issue (a) does not need to be scored for SG60 and SG80 (see definition of 'if necessary' in Table SA3 and Table GSA2).

However, there is no 'if necessary' clause in SG100 so that in order to score a 100 on this component, a management strategy should be in place for the UoA for P2 species, since gear loss or other incidental impacts could still occur.

GSA3.5.3 Reviewing measures for reducing unwanted catch ▲

Any non-negligible proportion of the catch that meets the unwanted definition (see SA3.1.6 and [GSA3.1.6](#)) for a particular species should be assessed as unwanted catch.

However, in cases where there is negligible unwanted catch of a species, the team may use their discretion as to whether the scoring issue would be scored, but the decision should be made in accordance with a precautionary approach. When determining what is 'negligible' the MSC does not specify a set cut-off; the team may consider the significance of the catch in relation to things like the proportion of the unwanted catch as part of the total catch or as part of the total amount of unwanted catch, as well as the regularity of the catch occurring when deciding whether it is negligible.

If there is no unwanted catch of primary species, or no primary species at all, then the 'Review of alternative measures' scoring issue (e) is not scored.

Example 1:

In a North Sea groundfish UoA, a percentage of the catch includes gurnard, all of which are thrown back dead. In this case the gurnard would be unwanted and this scoring issue should be scored for this catch. However, if all or almost all of the gurnard were to be kept for crew consumption or landed and sold, etc., the catch would no longer be considered unwanted and scoring issue (e) would not be scored.

Example 2:

In a longline UoA where a percentage of the catch includes a skate species, the skate species is immediately cut from the line rather than being landed. In this case the skate should be considered unwanted catch and the alternative measures reviewed should reflect the need to minimise the mortality of the species, with the expectation that released skate will have high survivability, or avoid capture in the first place.

Example 3:

In a developing world mixed species UoA, all species are landed and consumed or sold, so there is no unwanted catch and scoring issue (e) is not scored.

Example: Review of alternative measures

The management body for a fishery has investigated a number of measures that could be used to minimise the catch of Species A, a species that is discarded with poor survivability. They selected four potential measures that have been used in similar gears in other fisheries or to minimise mortality of this species. They do not have quantitative estimates of the exact levels that the potential measures might reduce the catch of Species A through their own field testing, but they have considered studies that have been done that show that implementing three of these measures would have no or little effect on reducing the catch of this species. The fourth measure, however, is estimated to reduce catch of this species by 80%. The measure is not expensive to implement (i.e., will not require replacing of current gear) and will not affect crew safety or significantly add time to vessel operations. It slightly reduces the catch of the target species, but not significantly so. It does not cause increased catches of other P2 'unwanted' or ETP species, nor does it negatively impact habitat. The management body recommends use of this measure but has not yet required it in legislation, nor has the fishery chosen to adopt it. This fishery has clearly reviewed alternative measures but has not yet implemented them. It would meet the SG60 level.

If the fishery were to adopt the use of this measure and it was being used at the time of the site visit, but there were no plans to undertake another review of measures, it would still only meet the SG60 level.

If the fishery were to adopt the use of this measure and it was being used at the time of the site visit, and another review was scheduled to take place in three years' time, it would meet the SG80 level. If the plan was that alternative measures would be reviewed every two years, it would meet the SG100 level.

GSA3.5.3.1 ▲

The assessment team should also consider how the alternative measures for review have been selected and whether appropriate gears and practices have been considered as part of the review.

The requirement is that the measures selected for review are those that have been shown to reduce unwanted catch levels to the 'lowest achievable levels.'

Where best practice measures in a gear/species/region have been established as achieving the lowest achievable levels – and therefore meeting the FAO's description of "proper selective and environmentally safe fishing gear" (see [Box GSA8](#)) – these measures should be included in the review.

Where best practice has not been established, or it is not clear which measures reduce catch to the lowest achievable levels, the assessment team should assess whether the review considers measures that are expected or known to minimise mortality of the unwanted species.

The gear and practices selected for review may be from a number of sources, including those that have been shown to be effective in similar fisheries or regions, or those presented as 'best practice' in international fora.

Some international fora with information and/or expertise on reducing unwanted catches include [Note: this list is provided to highlight some repositories of expertise for mitigation methods – it is not intended to be an exhaustive list]:

- Bycatch Reduction Techniques Database, Consortium for Wildlife Bycatch Reduction¹¹
- Agreement on the Conservation of Albatrosses and Petrels (ACAP)¹²
- Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS)¹³
- Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC-Sea Turtles)¹⁴
- International Union for Conservation of Nature (IUCN)¹⁵
- UNEP-CMS (United Nations Environment Programme – Convention on Migratory Species)¹⁶

In addition, many national bodies and regional fishery management organisations (RFMOs) have developed policies and procedures to reduce unwanted catch, e.g., the US NOAA Bycatch Reduction Engineering Program (BREP) and the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). The Western and Central Pacific Fisheries Commission also maintains a Bycatch Mitigation Information System¹⁷ for that region.

Where the P2 components are required to be harmonised with other MSC certified fisheries, teams should consider whether the UoA under assessment has considered the gear and practices used in these fisheries as part of their list of 'alternative measures', if they have been shown to minimise unwanted catches.

¹¹ <http://www.bycatch.org/>

¹² <http://www.acap.aq/>

¹³ <http://www.acap.aq/>

¹⁴ <http://www.iacseaturtle.org/>

¹⁵ <https://www.iucn.org/>

¹⁶ <http://www.cms.int/>

¹⁷ <http://www.wcpfc.int/bmis>

In situations where the proposed alternative mitigation measures are cost prohibitive or impractical for the fishery to implement, other lower cost alternative measures may be considered, such as improved education for fisheries regarding best practice approaches. This is not meant to be a means to avoid the costs associated with implementation of gear modifications or other measures, but as an alternative to achieve minimisation when other measures would render the fishery economically unviable.

GSA3.5.3.2 ▲

This clause requires that a regular review occurs at a minimum at least once every 5 years, which is at least once per certification cycle. Some fisheries may need to review alternative measures more frequently, depending on the extent and nature of the unwanted catch (e.g., due to changes in stock size). If information becomes available that the existing measures are ineffective, i.e., do not lead to any reductions in mortalities of unwanted species (e.g., at a surveillance audit), the assessment team may determine that a review should occur more frequently.

The 'regular review' at SG80 may be met if at least one review of alternative measures has been undertaken, that measures are implemented as appropriate, and there is a commitment from the client or the management body to have another review within the 5 year window.

GSA3.5.3.3 Evidence of implementation ▲

At SG80, the alternative measures may be implemented either within the UoA or in the wider fishery as part of a sub-strategy or code of conduct, etc. on unwanted catch (which could be either species-specific or covering all unwanted catch).

Evidence of implementation may, for example, include the development and use of codes of conduct or a description of appropriate ways of handling gear and catch on board vessels and in crew training records, and evidence from the fleet or observers that measures are being implemented by fishers.

The alternative measures should be implemented 'on the water' in order to achieve the SG80 or SG100 scores, unless any of the 'as appropriate' clauses under GSA3.5.3.3 are triggered.

Example:

Alternative measures were reviewed and decided on in 2008 and implemented in 2009. An assessment undertaken after the measures were implemented in 2009, and where another review of measures is scheduled within the next five years, should meet SG80 for this scoring issue. If, however, the assessment were undertaken in 2008 before the measures were implemented, this scoring issue should not yet meet the SG80.

Decisions surrounding implementation

Overall, the UoA should ensure that they balance the benefits of implementing a measure for one species against the likely impacts on another species or on habitats, and against the practical and economic consequences of implementation.

If measures reviewed are all equally effective at minimising the mortality of the unwanted species, and the practicality and costs are also similar, the UoA should choose the measure that might also lead to the minimisation of impacts on other species and/or habitats.

Where the measures reviewed are shown to be more effective at minimising unwanted catch, but the measures are not implemented, the assessment team should review the reasons for this which can be:

- Evidence that the practicality (e.g., crew safety, target catch, vessel operations) would be adversely affected by implementing the measures reviewed;
- Evidence that the UoA has assessed the economic costs and benefits of implementing the measure and determined that the potential costs would adversely impact the economic viability of the fishery, or
- Evidence that the UoA has considered the implications of relevant solutions on other species and habitats and found that there are negative consequences for species (e.g., causing them to fall below the PRI or outside biologically based limits or hindering their recovery from such a state) or habitats (e.g., causing serious or irreversible harm to the habitat), such that the measures should not be implemented.

FAO (2011) recognizes that there are both costs and benefits to implementing different measures that include direct and indirect costs, such as cost of the gear, impact on revenue from catch volumes or quality, operational efficiency and access or restriction to fishing opportunities. In addition, costs can be mitigated through the application of grants/loans and preferential treatment on duties and taxes for investment in new technologies. The judgement of whether costs are prohibitive should take into these issues into account together with the size and scale of a fishery.

Example: Prohibitive costs ▲

The management body of a small scale UoA in a developing country reviews potential mitigation measures on a regular basis. One measure reviewed has been shown in similar fisheries to reduce mortality of unwanted catch but does not affect target catch efficiency or crew safety. However, the UoA vessels decide not to implement the measure because they determine that there would be a 10% increase in costs arising from greater length of time for setting gear that – even when offset with potential benefits – would significantly impact their economic viability. In this case the assessment team would review evidence that the costs would be projected to increase by 10% (e.g., based on projected cost of purchasing measure and loss/gain in target species catches/quality) and that this increase would have a significant impact on the economic viability of the UoA (e.g., based on comparison to profit and loss, or turnover). If the assessment team concludes that implementing this measure would be cost prohibitive for the UoA and that the measure review was not implemented on this basis, the UoA could still meet SG80 for this scoring Issue (e).

On the other hand, if in this UoA, the cost of implementation was partially covered by a donation for the purpose from a funding body and an NGO, so that the increased cost to the UoA was not prohibitive to them, and all other criteria were met, the team should consider that the measures would need to be implemented to achieve an SG80 score or higher.

GSA3.6 Primary species information PI (PI 2.1.3) ▲

Background

The P2 species information PIs (2.1.3, 2.2.3, 2.3.3) address the information base for the management of the primary, secondary and ETP species respectively. The information and monitoring required in these PIs is intended to include that which is needed to determine the risk posed by the UoA and the effectiveness of the strategy to manage these species.

For each scoring element in each component, it is expected that the assessment team will use their expert judgement to decide whether the information provided is adequate to estimate the stock status in the Outcome PI and to evaluate methods and measures in the Management PI.

If the management approach is very precautionary or the status of the species is very high or the catches and impact of those catches are very low, information with low precision may be adequate for both the estimation of current status and the performance of the management strategy. Conversely, where the status is unknown or based on limited information, CABs would be expected to be more precautionary in their assessment of information adequacy to support the Outcome or Management PIs.

Scoring issue (a) Information adequacy for assessment of impact on main species ▲

In scoring issue (a), information is needed at the stock level in order to assess the impact of the UoA on the stock as a whole in relation to the point at which recruitment would be impaired.

Scoring issue (b) Information adequacy for assessment of impact on minor species ▲

For scoring issue (b), the guidance on adequacy for information to assess impacts of main species (GSA3.6.3 and sub-clauses) also applies to minor species, with the exception that minor species are only assessed at the SG100 level, noting that this level is equivalent to the SG80 level for main species.

GSA3.6.3 Scoring the adequacy of information ▲

At SG60

At SG60, to determine adequacy, CABs are required to assess the validity of the qualitative information used.

This may involve the review of a number of different sources of information (data triangulation). For example:

- The assessment team could start by identifying different stakeholder groups. Interviews could then be conducted with each of these groups and feedback from these groups could be compared to determine areas of agreement and areas of divergence.
- Another form of triangulation that could be used is methodological triangulation, involving the use of multiple qualitative methods to investigate an issue – for example, results from surveys, focus groups and interviews could be compared to see if similar trends are found. If conclusions from each are the same then validity is established (Guion et al, 2011).

In addition, benchmarks may be used to evaluate whether or not catch rates and magnitudes are low enough to be sustainable and avoid serious harm, and qualitative advice may be adequate to assess this (DFO, 2012).

Example:

If only life history information is known (i.e., no fisheries-independent survey data) methods for assessing mortality of unwanted species could include: indirect methods for estimating natural mortality (if only size or age or length-at-age data are available) or unstructured demographic approaches (if data on reproduction, natural mortality, age at maturity and lifespan are available) (DFO, 2012).

At SG80

At SG80, the information adequacy required for the estimation of the impact of the UoA on the outcome of the species should be balanced against the likely impact on that particular species.

The likelihood that the UoA impacts the species is set out in the Outcome PI (likely, highly likely, high degree of certainty) in a probabilistic context (70%, 80%, 90% for primary and ETP species; 60%, 70%, 80% for secondary species), see SA3.2.3. In order to meet this scoring guidepost, some quantitative information needs to be available in addition to the qualitative information required at SG60. The data triangulation method described at SG60 above would also apply to this SG.

Generally, having only one form of data collection with a high level of potential bias or other limitation (e.g., logbooks or interviews with fishermen) by itself should not be enough to meet SG80 – additional information sources that compensate for the limitations would also need to be provided and assessed (see examples of information sources and how they could be combined in GSA3.6.3).

At SG100

At SG100 the scoring issue requires that estimates of catch and UoA-related mortality of all species are quantitative and available with a 'high degree of certainty'.

This should be equivalent to greater than or equal to the 90th percentile in the distribution (for primary and ETP species) or 80th percentile in the distribution (for secondary species).

It is intended that this information builds on the qualitative and quantitative information included at SG60 and SG80.

Observer programmes

With regard to observer programmes, teams may consider factors such as how representative the sampling is, whether observer coverage is based on the total effort or number of trips, any spatial or temporal limitations on data collected, definition and rigour of data collection protocols, what training observers have had in terms of species identification, and the priorities for observer time on the vessel (Bravington et al, 2003; DFO, 2012; Wolfaardt, 2011).

The level of observer coverage required to assess the impact of the UoA on outcome status depends on factors such as the frequency of capture/mortality, the variability in rates of capture/mortality, a desired CV and/or information required to show that upper confidence limit on mortality for a species is below a pre-defined sustainability threshold (Bravington et al, 2003; Wolfaardt, 2011). There is not a single optimum level of observer coverage that covers all fisheries and species caught/killed. Generally, for species that are highly variable, clumped in distribution and/or relatively rare, higher levels of observer coverage are needed

(Wolfaardt, 2011). For more normal species, observer coverage rates above 20% provide only diminishing returns and small incremental improvements in the CV of catch estimates (Lawson, 2006).

GSA3.6.3.1 ▲

The catch of a species may be estimated using a variety of methods and each can have certain advantages and/or disadvantages associated with them. It is up to the assessment team to use their expert judgement to assess the adequacy of the methods used, particularly with respect to the precision and bias (statistical and observational bias) of the method and its ability to provide externally verifiable data. For instance, the observational bias of logbook data is generally regarded as being much higher than electronic or observer monitoring, but may still be adequate if e.g., triangulated with other data sources that compensate for this bias or otherwise provide reassurance.

Where limited information is available, teams should be more precautionary in their assessment of information adequacy to support an Outcome PI score.

Some examples of data collection methods include (but are not limited to) those specified in [Table GSA5](#). Column A contains data collection methods that have higher validity as they are less subject to bias than those in Column B.

Table GSA5: Examples of data collection methods according to their level of verifiability

Column A (higher level of verifiability, lower bias)	Column B (lower level of verifiability, higher bias)
Observer programmes	Standardised logbooks
Electronic monitoring of location/position (e.g., VMS, AIS)	Interviews with fishers
Other technologies to monitor impact/compliance (e.g., cameras)	Enforced mandatory retention of all catch with full dockside monitoring
Independent research projects or programmes	Information obtained from co-management and community based management.

At the SG80 and 100 level in scoring issue (a), where a species is close to or below its limit or its status is uncertain, the team should expect that the UoA uses at least one method from Column A or an equivalent data source, and one or more from Column B to collect information to support the Outcome score for that species. However, where there is a high level of certainty that a species is well above its limit, less precaution is necessary and only two or more methods from Column B could be acceptable.

Some methods of recording data that are inherently open to bias, such as logbooks, are also less likely to provide accurate data on non-fish species, and therefore when considering the need for accurate information on interactions with out of scope species CABs should seek higher quality data sources (column A of the table).

Example:

During the assessment of a developing world, small scale gillnet UoA, it became clear that there is some evidence that local fisheries in general are having an impact on the endangered Ruby Dolphin as a local NGO interview reveals that they have approximately 10 sightings per year of stranded individuals with signs of gear interactions reported (Column B-type information source). However, it is not clear whether these interactions have come from the UoA or another fishery in the area.

Interactions with ETP species such as the Ruby Dolphin are monitored through sporadic landings monitoring by a government agency (Column B-type information source). The agency reports the gear used and any bycatch species that are landed, to the species level where possible. Through this monitoring, there was one report of 1 Ruby Dolphin mortality in the past two years in this UoA.

In addition, interviews with the government officer in charge of the inspections, the fishers themselves have indicated that entanglements with cetaceans are rare in this fishery, but that when they do occur that the species are able to be safely released (Column B-type information sources).

The evidence from the landings data and interviews is assessed by the team as meeting the SG60 requirement for Ruby Dolphin. However, due to the poor conservation status of this species and the uncertainty over the true impact of the fishery on this species, it does not meet the SG80 level, i.e., there are no Column A-type data sources to validate the information.

If in addition to the above, the local NGO or a University researcher were to undertake a short-term quantitative research project investigating the number of interactions within this fishery and their likely outcome (mortality, injury, release without harm), and that this research validated that the impact was in fact very low, then the combined evidence would meet the SG80 level.

In addition to the catch, the UoA-related mortality of caught species needs to be understood, particularly for unwanted catch. If not killed outright, the eventual mortality of unwanted catch returned to the sea, i.e., the number that will eventually die if released, thrown away, or slipped can be estimated using methods such as confinement, field observations, tagging and telemetry (Suuronen, 2005; Neilson et al, 2011). However, these methods can be expensive and alternative methods to estimate mortality based on proxies can be effective with certain species or in certain circumstances, including:

- Observer assessment of individual species vitality (e.g., prior to release/throwing away) or physical condition as a proxy for mortality (Richards et al, 1995; DFO, 2012);
- Time to mortality (TM) estimates (Benoit et al, 2013);
- Biochemical indicators (Beamish, 1966)

GSA3.6.3.2 ▲

In scoring issue (a) CABs are required to consider a number of factors when determining the adequacy of the information in relation to its ability to determine and to detect changes in the outcome indicator score.

The background document to the FAO Guidelines on the Precautionary Approach to Fisheries (FAO, 1996) suggests that fisheries assess statistical power of the tests and methodologies used for comparing the relative 'soundness' of the information available. The statistical power measures the probability that the monitoring programme will effectively detect the reduction of the reproductive capacity below safe thresholds, and is strongly influenced by the elements listed in SA3.7.4.2. The lower the statistical power of the assessment, the more precautionary the management response should be (FAO, 1996).

GSA3.6.4 ▲

If there is unwanted catch and Scoring Issue (e) on the 'review of alternative measures' is scored in the Management PI 2.1.2, information should also be adequate to support understanding the effectiveness and practicality of measures used by the UoA as well as potential alternative measures.

GSA3.7 Secondary species outcome PI (PI 2.2.1)

GSA3.7.1 Treatment of out of scope species ▲

Out of scope species (birds, reptiles, amphibians, mammals) are always considered a main species regardless of their total catch volume.

GSA3.7.2 Recognition of 'considerable' catches for out of scope species ▲

To determine whether catches are considerable as defined in SA 3.7.4 for out of scope species, teams should use their expertise and a precautionary approach to determine whether the UoA impact is considerable or not. For such species, the 10% default catch weight requirement may be less applicable than for in-scope species. Precautionary measures may include looking at proxies for fishing related mortality as defined in [GSA2.2.3](#).

GSA3.7.3 Consideration of efforts to minimise the mortality of unwanted catches ▲

The guidance for clause [GSA3.4.7](#) applies here also.

GSA3.8 Secondary species management strategy PI (PI 2.2.2) ▲

The guidance for clause [GSA3.5](#) applies here also.

GSA3.9 Secondary species information PI (PI 2.2.3) ▲

GSA3.6 applies here also.

GSA3.10 ETP species outcome PI (PI 2.3.1) ▲

Scoring issue (a) – Combined impacts of MSC UoAs

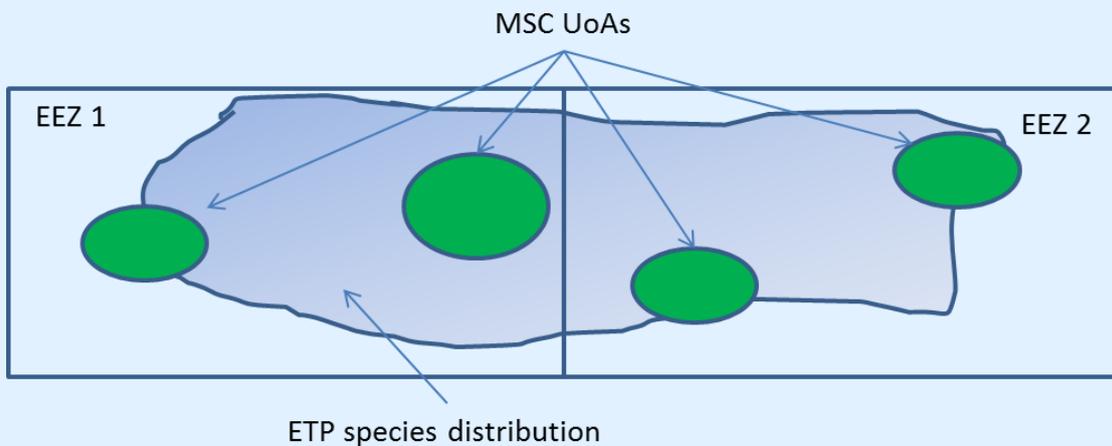
The team should consider whether the ETP species overlaps with other MSC UoAs and whether there are limits set that pertain to these UoAs in either national legislation or binding international agreements.

As indicated in [GSA3.1.5.2](#), the intent of the MSC when referring to agreements that are “binding” is that the international legislation is binding on the parties to the agreement. Neither the flag state of the UoA, nor the state in which fishing takes place, need be a signatory to this agreement for it to be applicable to MSC certified UoAs.

Example 1: Two EEZs, one with limits and one without

For example in [Figure GSA5](#) below, an ETP species distribution overlaps with four MSC UoAs, two of which are in EEZ 1 and two in EEZ 2. EEZ 1 has national limits set for the ETP species, but EEZ 2 does not. There are no international limits set through international agreements for the ETP species. In this case, the assessment team should score the MSC UoAs in EEZ 1 using scoring issue (a) and should take the combined impacts of only the EEZ1 MSC UoAs into account. The assessment team should score the MSC UoAs in EEZ 2 using scoring issue (b) and would not need to take their combined impacts into account.

Figure GSA5: Example ETP species distribution



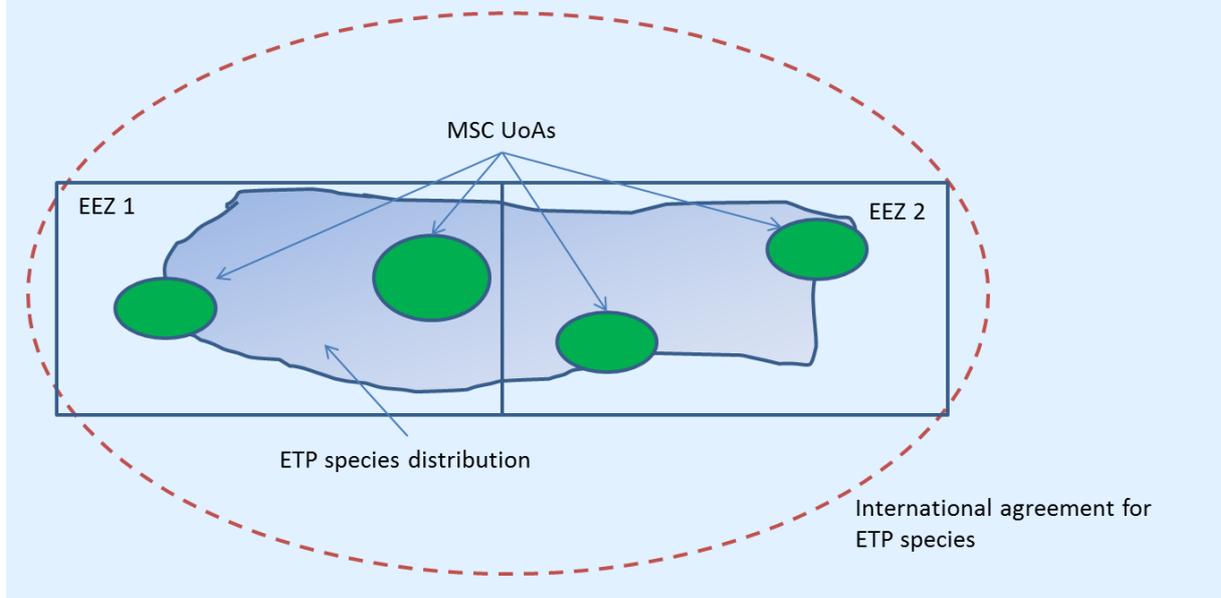
Example 2: Two EEZs, both with different limits

In [Figure GSA5](#) above, let us instead suppose that both EEZ 1 and EEZ 2 have set national limits for the ETP species, but these limits are only for the fisheries within their respective EEZs. There are no international limits set through international agreements for the ETP species. In this case, the MSC UoAs in both EEZs would use scoring issue (a) to score the species. However, the assessment team should consider the combined impacts of UoAs in EEZ 1 and the combined impacts of UoAs in EEZ 2 separately (i.e., the 2 MSC UoAs in EEZ 1 in relation to EEZ 1 limits and the 2 MSC UoAs in EEZ 2 in relation to EEZ 2 limits).

Example 3: Two EEZs, one with limits and one without, and international agreement with limits

In [Figure GSA6](#) below, EEZ 1 has national limits for the ETP species for fisheries within their EEZ and EEZ 2 does not. However, there is also an international agreement for the ETP species that sets a limit within a specified area. EEZ 1 is a signatory to this agreement and EEZ 2 is not, although both operate in the agreement area. In this case, the assessment team should consider that as there are limits set by the international agreement, the species should be scored in scoring issue (a) for all UoAs, irrespective of whether they are in EEZ 1 or EEZ 2. The limits set by the international agreement should be the ones that the combined impacts of MSC UoAs need to be within, regardless of whether they are within their own separate national limits.

Figure GSA6: Example of ETP distribution in relation to MSC UoAs and two national EEZs, with international agreement for ETP species



GSA3.10.3 ▲

Guidance for clause [GSA3.4.7](#) applies here also, noting that where those clauses refer to mortality of unwanted catch they apply here to mortality of ETP species.

GSA3.11 ETP species management strategy PI (PI 2.3.2) ▲

Guidance [GSA3.5](#) applies here also.

GSA3.11.1 ▲

At all three scoring guideposts in scoring issue (a), teams are required to consider the need to minimise mortality. At SG80 and SG100, however, the scoring issue refers to the need for the strategy or comprehensive strategy to manage the UoA's impact on ETP species (see definitions in [Table SA8](#) and associated guidance in GSA3).

In addition to minimising mortality, the teams should consider the strategy/ comprehensive strategy's ability to manage indirect impacts here, in line with scoring in the Outcome PI 'indirect effects' scoring issue.

GSA3.11.3 ▲

Guidance for clauses [GSA3.5.3](#) and its sub-clauses applies here, noting that in primary and secondary PIs the aim is to minimise UoA-related mortality of unwanted catch but in ETP the aim is to minimise UoA-related mortality of all ETP species.

GSA3.12 ETP species information / monitoring PI (PI 2.3.3) ▲

Guidance [GSA3.6](#) applies here also, except for guidance on specific scoring issues (a) and (b) as there is no ‘main’ distinction for ETP.

GSA3.13 Habitats outcome PI (PI 2.4.1) ▲

Use of UoA

In PI 2.4.1, the impact of the UoA itself is assessed. Thus, the “status” of the habitat, in terms of its current state and likely recoverability (see [GSA3.13.3](#)), should be determined with respect to the impacts of the UoA rather than all fishing impacts.

Treatment of vulnerable marine ecosystems

The definition of serious and irreversible harm (see [Table SA8](#), [SA3.13.3](#), and the [associated guidance](#)) allows for there to be some continued fishing on all habitats. Even UoAs operating in very slow-recovering habitats, for instance vulnerable marine ecosystems (VMEs), may be managed so that the impact from fishing continues but is minor and tolerable.

The MSC requirement is that habitats are not impacted beyond the point at which they could recover to 80% (or more) of their unimpacted level within 5-20 years. VMEs are generally habitats with slow recovery rates that are unlikely to be able to recover within 5-20 years from states below 80% of their unimpacted levels. For this reason and due to the fact that VMEs are afforded specific consideration in international and customary law (the UNGA resolutions and FAO Guidelines), VMEs should not be reduced to a state below 80% of the unimpacted level.

Although an individual UoA may achieve an 80 score in the outcome PI 2.4.1 when fishing on a VME because its individual impact is unlikely to cause the VME serious and irreversible harm, the MSC recognises the unique value of VMEs and the possibility that all fishing (all MSC UoAs plus other fisheries – see [SA3.14.3](#), the subclauses, and the [associated guidance](#)) may nevertheless be causing more than 20% damage to VMEs. Therefore, unless there is a comprehensive management plan (see [SA3.14.2.1](#) and the [associated guidance](#)) covering all fishing impacts on the VME, under the management PI 2.4.2, MSC requires that UoAs avoid VMEs even if they score higher than 80 on the outcome PI 2.4.1.

GSA3.13.1 Habitat structure and function ▲

The habitat’s structure and function (i.e., the ecosystem services that it provides), including abundance and biological diversity, is of concern in an MSC assessment. Thus, an assessment should look not only at the impact on the habitat but also the habitat’s delivery of ecosystem services. For instance, if only a part of the habitat is affected by fishing but this part delivers the greatest ecosystem services, then this should be taken into account in the assessment. Particular habitats may determine the carrying capacity of the target, primary, secondary, and/or ETP species, and a mosaic of habitats may be necessary for some species to complete their life cycle or determine the overall composition of the ecological community.

GSA3.13.1.1 Use of the RBF ▲

Teams may score the outcome PI 2.4.1 for data-rich UoAs using the default assessment tree or for data-deficient UoAs using the alternative Consequence Spatial Analysis (CSA) (Annex PF).

When using the default assessment tree to score the PI, the UoA should have information of sufficient quality to undertake an analytical approach effectively. First, the CSA defines a habitat using the SGB nomenclature ([SA3.13.2](#); see also Table GSA6).

Second, the CSA utilises inferences and proxies for the habitats' and gears' attributes to extrapolate the risk to habitats from the fishing gear.

The default assessment tree requires knowledge of the likelihood that the UoA does not cause serious or irreversible harm to the habitat, meaning that the following questions must be answered:

- What habitats are encountered by the UoA?
- What are the impacts of the gear(s) on those habitats?

To answer the first question in a non-data-deficient situation, the team should have UoA-specific (quantitative) SGB information and/or data, such as detailed habitat mapping for the relevant area (as defined in [SA3.13.5](#)). To answer the second question in a non-data-deficient situation, the team should have gear-specific (quantitative) impact information and/or data, such as fishing-effort mapping with knowledge of regeneration ability that is specific to the UoA and/or habitat-specific research results that examine the impact of the gear(s) on habitats in the relevant area.

If the available information is not UoA specific but more generic (qualitative) relating to the general area in which the UoA operates or to a broader region, the CSA will likely be needed to score the outcome PI effectively. Finally, if the type and quality of information is uncertain, the CAB would need to rationalise whether or not the CSA is needed.

GSA3.13.2 Habitat characteristics ▲

Usually habitats impacted by the UoA are benthic habitats (i.e., associated with or occurring on the bottom) rather than pelagic habitats (i.e., near the surface or in the open water column), but impacts on the biotic aspects of pelagic habitats could be considered.

When determining which benthic habitats are impacted by the UoA, the team should consider habitats on the basis of the substratum, geomorphology, and (characteristic) biota (SGB) characteristics.

Table GSA6 provides examples of what constitute the SGB characteristics. For example, one habitat may be defined as fine – low relief – no fauna or flora. (Note that this nomenclature is also used within the CSA, which is used to assess habitat impacts in data-deficient situations.) It is not the intent that the team creates a table of this nature for the UoA's habitats. Rather, the intent is that the team uses this table to categorise the habitats affected by the UoA prior to assessment.

Table GSA6: SGB habitat nomenclature (modified from Williams et al., 2011¹⁸)

Substratum	Geomorphology	Biota
Fine (mud, sand) <ul style="list-style-type: none"> • Mud (<0.1 mm particle diameter) • Fine sediments(0.1-1 mm) • Coarse sediments (1-4 mm) 	Flat <ul style="list-style-type: none"> • Simple surface structure • Unrippled/flat • Current rippled/directed scour • Wave rippled 	Large erect Dominated by: <ul style="list-style-type: none"> • Large and/or erect sponges • Solitary large sponges • Solitary sedentary/sessile epifauna (e.g., ascidians/bryozoans) • Crinoids • Corals • Mixed large or erect communities
Medium <ul style="list-style-type: none"> • Gravel/pebble (4-60 mm) 	Low relief <ul style="list-style-type: none"> • Irregular topography with mounds and depressions • Rough surface structure • Debris flow/rubble banks 	Small erect/encrusting/burrowing Dominated by: <ul style="list-style-type: none"> • Small, low-encrusting sponges • Small, low-standing sponges • Consolidated (e.g., mussels) and unconsolidated bivalve beds (e.g., scallops) • Mixed small/low-encrusting invertebrate communities • Infaunal bioturbators
Large <ul style="list-style-type: none"> • Cobble/boulders (60 mm - 3 m) • Igneous, metamorphic, or sedimentary rock (>3 m) 	Outcrop <ul style="list-style-type: none"> • Subcrop (rock protrusions from surrounding sediment <1 m) • Low-relief outcrop (<1 m) 	No fauna or flora <ul style="list-style-type: none"> • No apparent epifauna, infauna, or flora
Solid reef of biogenic origin <ul style="list-style-type: none"> • Biogenic (substratum of biogenic calcium carbonate) • Depositions of skeletal material forming coral reef base 	High relief <ul style="list-style-type: none"> • High outcrop (protrusion of consolidated substrate >1 m) • Rugged surface structure 	Flora Dominated by: <ul style="list-style-type: none"> • Seagrass species

^{18 18} Williams, A., Dowdney, J., Smith, A.D.M., Hobday, A.J., and Fuller, M., 2011. *Evaluating impacts of fishing on benthic habitats: A risk assessment framework applied to Australian fisheries*. Fisheries Research 112(3):154-167.

GSA3.13.3 Main habitats ▲

The determination of commonly encountered habitats and VMEs (both of which are treated as “main” habitats in the information PI 2.4.3) should be supported by evidence provided by the UoA to the assessment team. If a habitat’s designation is uncertain, the team should take the precautionary approach, identify uncertain habitats as commonly encountered or VMEs as appropriate, and then most likely use the CSA (Annex PF).

GSA3.13.3.1 Commonly encountered ▲

Commonly encountered habitats would likely include those that the target species favours, that the UoA’s gear is designed to exploit, and/or that make up a reasonable portion of the UoA’s fishing area.

GSA3.13.3.2 VME ▲

VMEs have one or more of the following characteristic, as defined in paragraph 42 of the FAO Guidelines:

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

The FAO Guidelines’ Annex identifies the following species groups, communities, and habitat-forming species that may form VMEs and may be indicative of the occurrence of VMEs:

- Certain coldwater corals and hydroids (e.g., reef builders and coral forest, such as stony corals, alcyonaceans, gorgonians, black corals, and hydrocorals)
- Some types of sponge-dominated communities
- Communities composed of dense emergent fauna where large sessile protozoans and invertebrates (e.g., hydroids and bryozoans) form an important structural component of habitat
- Seep and vent communities comprised of invertebrate and microbial species found nowhere else (i.e., endemic)

The FAO Guidelines’ Annex also lists various geographical features that are often associated with these communities.

The MSC's intent is that, even though the FAO Guidelines were written for deep-sea fisheries, the Guidelines' VME characteristics also apply to non-deep-sea fisheries. Further, when the FAO Guidelines are applied in shallow, inshore waters, the definition of VME could include other species groups and communities (e.g., seagrass beds, complex kelp-dominated habitats, biogenic reefs).

GSA3.13.4 Serious or irreversible harm ▲

The MSC's definition of "serious or irreversible harm" is very similar to the FAO Guidelines'¹⁹ definition of "significant adverse impacts". A key consideration in both definitions is the concept of reversibility or recoverability. Both definitions consider the time frame required for a habitat to recover. Damage requiring 5-20 years (or more) from which to recover should be considered "serious or irreversible" or "significantly adverse", consistent with FAO (2009).

The MSC defines "recovery" as recovering to at least 80% of the level to which the habitat would eventually recover in the absence of all fishing, considering the existing environmental and anthropomorphic conditions – a hypothetical climax state under existing conditions. This is often referred to in the text as an "unimpacted" level.

For VMEs the pre-existing historical extent of the habitat should be considered in the calculation of the current state of the VME in relation to unimpacted levels if the historical extent is known and if recovery in those areas of historical extent would be possible. If the habitat has been altered completely so that the pre-existing state does not exist, recovery of that state is not expected; however if recovery of the pre-existing state is possible, this should be considered.

Example:

Off the north coast of Australia, several shelf-break VME areas have been damaged but are still there in reduced form and would recover if left undisturbed for several years. Therefore, these areas should be considered within the scope of the habitat's recovery.

The MSC has nominated the 80% level as a reasonable point at which to expect most of the habitat's structure and function (including abundance and biological diversity) to have been restored, taking into consideration the likely logistic population growth of habitat-forming organisms.

Likelihood of recovery should take into account the likely speed of recovery (a higher score for recovery within 1 year, for instance, than within 20 years) as well as the certainty of recovery of a habitat.

¹⁹ Food and Agriculture Organization of the United Nations, 2009. *International guidelines for the management of deep-sea fisheries in the high seas*. FAO, Rome.

Example:

Figure GSA6 and Table GSA7 provide some examples of recovery rates and resulting habitat status in some hypothetical situations. For each of these examples, it is assumed that the UoA is the only one impacting the habitat (i.e., all fishing impacts on the habitat are covered by the one UoA). If multiple UoAs were impacting the habitat, the individual UoAs' impacts would be less.

Example A (dotted line) represents the current status (in relation to unimpacted status) of the habitat impacted by a moderate-impacting UoA (e.g., demersal longline). This UoA impacts 60% of the entire distribution of this habitat type (shown in Figure GSA6). It also fully protects 40% of the habitat type inside a closed area (not shown in figure). Because the gear is moderate impacting, the habitat status in the fished parts of the habitat is 50% of the unimpacted level. The recovery rate for this habitat type is fast, and it is likely that the overall status of the habitat would rise above 80% of the unimpacted level in around 5 years. Combined with the unimpacted status of the habitat in the closed area, this means that the habitat would recover to 80% of the unimpacted level in 5 years, achieving at least an 80 score and potentially a higher score if there is greater confidence supported by evidence for this expected recovery.

Example B (dotted and dashed line) represents the status of the habitat impacted by a high-impacting UoA (e.g., demersal trawl) that protects 40% of the habitat type and fishes the other 60%. Again, the status of the impacted habitat area is shown in the figure but not the status of the habitat within the protected area. Since this is a high-impacting gear, the habitat has been degraded in the fished areas to 10% of the unimpacted level. This habitat is not very resilient, barely reaching the 80% level in 20 years and not reaching it in 5 years. Across both the closed area and the impacted areas, the UoA would be unlikely to be causing serious or irreversible harm but with less confidence than Example A (possibly achieving a 60 score in this case).

Example C (solid line) represents the same high-impacting UoA that protects 40% of a slow-growing habitat and fishes the other 60% of that habitat, the latter which has been degraded to 10% of the unimpacted level. This habitat has a very slow recovery rate and will take longer than 20 years to reach the 80% unimpacted level. This UoA is, therefore, causing serious or irreversible harm to this habitat and would not be likely to score a 60

Figure GSA7: An illustration of different example recovery rates for habitats over time under different fishing conditions where fishing is removed at year 0

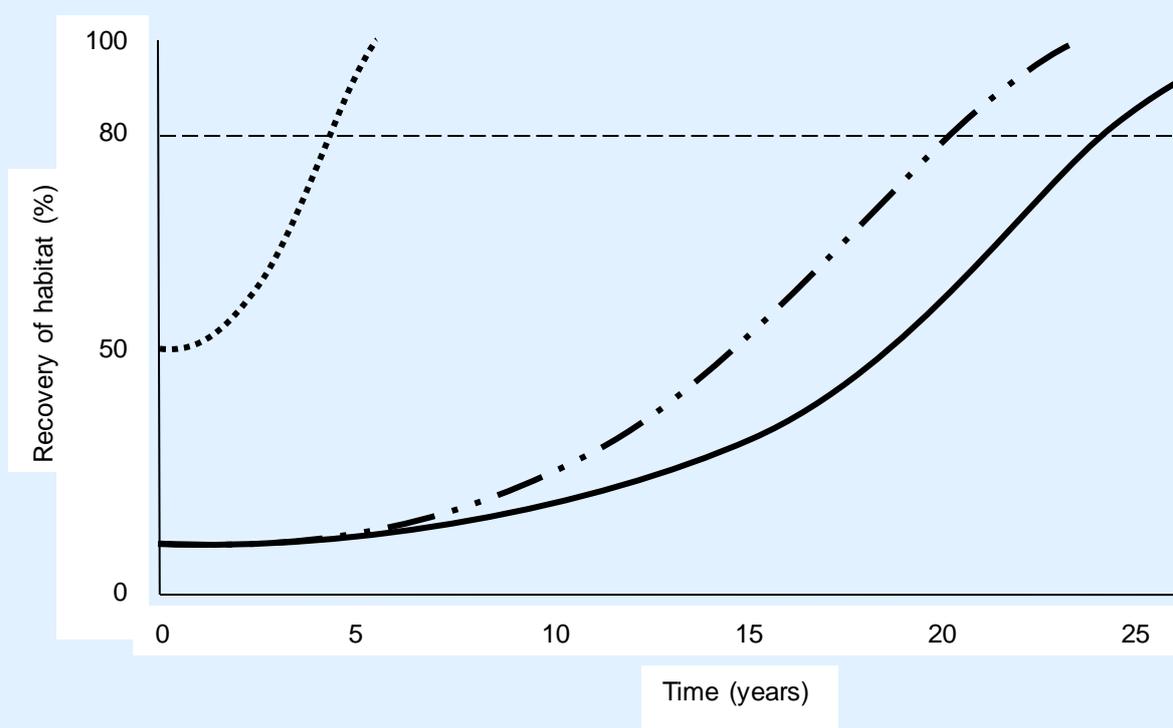


Table GSA7 provides additional details on the UoAs and habitats to accompany the examples provided in Figure GSA6. Rows A-H illustrate in a qualitative sense how the overall habitat status could be estimated, both at the current time and in the future depending on (1) the extent of habitat protection in a closed area, (2) the level of habitat degradation outside the closed area, and (3) the habitat recovery rate. Any current scenario that results in the overall habitat being less than 80% of the unimpacted level is considered serious or irreversible harm. Row I gives the likelihoods of the UoAs causing serious or irreversible harm (see Table SA9), and Row J gives the corresponding MSC scores.

Table GSA7: UoA and habitat characteristics for the examples in Figure GSA6

UoA and habitat characteristics	Example A (dotted line)	Example B (dotted and dashed line)	Example C (solid line)
A. Proportion of habitat fully protected in closed area	40%	40%	40%
B. Area of habitat subject to fishing	60%	60%	60%
C. Level of gear impact	Moderate	High	High
D. Current status of habitats in fished areas (% of unimpacted level)	50%	10%	10%
E. Current overall status of habitat, compared to unimpacted level (A + [B x D])	70%	46%	46%
F. Habitat recovery rate	Fast	Medium	Slow

G. Expected future status of habitats in fished areas in 20 years if fishing ceases (% of unimpacted level)	100%	80%	50%
H. Expected future overall status of habitat in 20 years, compared to unimpacted level (A + [B x G])	100%	88%	70%
I. Likelihood that the UoA is causing serious or irreversible harm	Highly unlikely	Unlikely	Not unlikely
J. MSC score	80 or higher, depending on confidence and evidence (unconditional pass)	60 (pass with condition)	<60 (fail)

GSA3.13.4.1 ▲

The special consideration of serious and irreversible harm afforded to VMEs derives from both their generally long recovery times and the special status afforded them in international and customary law (see above, [PI 2.4.1](#)). While many VMEs may have long recovery times, some may not, but they are all subject to the specific VME requirements in this clause.

MSC's adoption of the FAO Guidelines for identifying VMEs (see [GSA3.13.3.2](#)) means that habitats with recovery times substantially greater than 20 years should usually be identified as VMEs. Habitat recovery here relates to the whole habitat, not just some species within a habitat. There may be some habitats with long recovery times that for some reason do not meet the FAO Guidelines' definition on VMEs. However, even for these non-VME habitats, an inability to recover from small reductions in state in fewer than 20 years should lead to a conclusion under the provisions of [SA3.13.4](#) that it would not be possible to deplete them below 80% and still expect them to recover to 80% within 5-20 years.

Note that the minimal VME damage that occurs when a move-on rule is triggered should not be counted as serious or irreversible harm even when a VME habitat is below 80% of its unimpacted level.

GSA3.13.5 Area of consideration ▲

The MSC's intent in specifying the "area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates" (the "managed area" for short) is to consider by default the habitat impacts within the areas controlled by the management regimes under which the UoA operates. This may be a single EEZ, a combination of EEZs in the case of a UoA that fishes on a shared stock, a combination of an EEZ and an RFMO, or entirely an RFMO. For many UoAs, the managed area may be only part of an EEZ (for example, the jurisdictional area for the UoA or the area covered by a management plan under which the UoA operates).

However, where there is reasonable evidence that the habitat distribution extends beyond the "managed area", the assessment of habitat impacts should be based on this extended distribution. The basis for concluding that the habitat range extends beyond the "managed area" should be documented clearly.

Two types of exceptional cases exist:

- Situations where the range of the habitat is much smaller than the area of the governance body's control (e.g., where the RFMO covers an entire ocean but the habitat is restricted in distribution) or where it is not sensible to consider the entire area because areas under that governance body's control are not contiguous (e.g., where an EEZ covers two separate areas) or have quite different bio-physical and habitat characteristics.
- Situations where the managed area is extremely restricted, such as cases where an EEZ has only a very narrow extent due to encroaching baselines of adjoining EEZs, and it does not make sense to consider such a narrow habitat within the assessment.

Examples of these exceptional cases:

- The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) manages fishing throughout the Southern Ocean. Clearly, it would not be appropriate or feasible to include the entire area covered by CCAMLR when considering the range of the habitat(s) affected by vessels fishing only in the Ross Sea.
- A fishery that operates mainly in the Norwegian Trench overlaps with the North Sea and the Norwegian EEZ. These latter two areas cover more than 3 million km² in total. It is likely that the UoA is fishing a relatively small portion of this total area and therefore impacting a small portion of the habitat(s). Again, it would not be reasonable to consider the entire range of the habitat(s) across the total area.
- The Gambia coastline is only 800 km and the EEZ is only 19,500 km². Several habitats extend along much of the western coast of Africa, extending into other EEZs. Given the small area controlled by the Gambian government, it would be appropriate to consider the habitat(s) range beyond the Gambian EEZ.

In such exceptional cases, it would be reasonable for the assessment team to scale up or scale down the "managed area" when determining the appropriate habitat range to consider.

The team should apply expert judgement and provide rationale for such scaling.

GSA3.14 Habitats management strategy PI (PI 2.4.2) ▲

MSC's approach to management of VMEs

The MSC's approach to the assessment of sustainability with regard to VMEs is based on the UNGA resolutions (especially 61/105 and 64/72) and more specifically the FAO Guidelines for deep-sea fisheries. The central requirements of the FAO Guidelines are as follows:

- A set of criteria for identifying VMEs
- Impact assessments to determine if fishing activities are likely to produce significant adverse impacts on VMEs
- Acquisition of data to determine the fishing footprint and the interaction of fisheries with VMEs

- Development of a “functioning regulatory framework” that includes regulations to protect VMEs
- In the absence of a functioning regulatory framework, establishment of an interim precautionary approach that allows for the development of appropriate conservation and management measures to prevent significant adverse impacts on VMEs while preventing such impacts from taking place inadvertently and that consists of (a) closing of areas where VMEs are known or likely to occur and (b) refraining from expanding the level or spatial extent of effort of vessels involved in deep-sea fisheries

These elements are incorporated into the MSC requirements by requiring either a comprehensive management plan (see [SA3.14.2.1](#) and the [associated guidance](#)) that determines that all fishing will not cause serious and irreversible harm to VMEs or that MSC UoAs should avoid VMEs individually and cumulatively (implementing the final bullet above).

The wording of the management PI 2.4.2 requires that management measures/strategies are expected to deliver the outcome PI’s SG80 level, which is based on an assessment of the UoA’s impact.

This should be taken as the desired outcome of the management measures/strategies for non-VME habitats as well.

Scoring issue (a) Management strategy in place ▲

“If necessary” does not appear in the scoring issue (a) at the SG100 level, meaning that in order to score 100, a management strategy should be in place for all UoAs (see [Table GSA3](#)), even those that do not regularly contact benthic habitats since gear loss or unexpected benthic change could occur.

[Table GSA8](#) provides an example of a strategy for a pelagic UoA.

GSA3.14.1 ▲

Where there is a VME in the UoA’s “managed area” (see [SA3.13.5](#), the subclauses, and the [associated guidance](#)), the management PI 2.4.2 is scored in relation to both non-VME habitats and VMEs.

GSA3.14.2 ▲

Generic guidance is given on the differences between measures, partial strategy, and strategy (see [Table GSA3](#)). [Table GSA8](#) provides examples of measures, partial strategies, and strategies in terms of benthic habitats. These are only examples of such management levels and do not necessarily meet the whole of the scoring rationale requirements. Assessment teams should always use their expert judgement to determine how well, or otherwise, management measures, partial strategies, or strategies are designed to ensure the UoA does not pose a risk of serious or irreversible harm to relevant habitats.

A strategy should include regular review of alternative measures to reduce the impact of the UoA on the habitat. Appropriate alternative measures determined in this review should also be considered during the review of measures to minimise unwanted catch (PIs 2.1.2, 2.2.2, and 2.3.2), particularly when making a decision on which measures to implement (refer to [Box GSA8](#) and [SA3.5.3](#)).

GSA3.14.2.1 ▲

UoAs may qualify for a higher score on this PI if they have a comprehensive management plan that is supported by a comprehensive impact assessment that determines that all fishing activities will not cause serious or irreversible harm to VMEs. The MSC equates this higher level of performance to the FAO Guidelines' best management practice "functioning regulatory framework". A comprehensive management plan could also include avoidance measures to ensure that serious or irreversible harm to VMEs does not occur.

Some damage to VMEs is acceptable as long as overall serious or irreversible harm to structure and function is avoided. If a strategy chooses not to afford complete protection to all VMEs in an area, this decision should include an impact assessment to demonstrate that serious or irreversible harm is avoided and that VMEs are not impacted more than 20% of their unimpacted levels. In cases where the historical distribution of VMEs is known and it can be expected that damaged areas could recover, these should be included in the calculation of "unimpacted level".

In cases where a comprehensive management plan is in place but the VME is below the 80% recovery criterion, the plan should first allow the VME to recover to at least 80% before fishing continues. In other words, the only allowance for continued fishing by MSC UoAs on a VME is (a) if there is a comprehensive plan that shows that all fishing will keep the VME at 80% or recover it to 80% and (b) when the VME has recovered or is above 80%.

A comprehensive, formal impact assessment may not be necessary in all cases (e.g., when benthic gear are prohibited but pelagic gear are permitted because the risk to benthic habitats is very negligible). Refer to [Table GSA8](#) for an example of a strategy for a pelagic UoA.

GSA3.14.2.2 ▲

In the absence of a comprehensive management plan that takes all fishing activities into account, MSC UoAs cannot necessarily assume that their impacts, while unlikely to cause serious and irreversible harm on their own (and therefore potentially meeting the SG80 level under the outcome PI 2.4.1), will not contribute to a cumulative impact that is serious and irreversible to VMEs.

Therefore, the MSC will expect these MSC UoAs to take appropriate action within measures/strategies to avoid impacting VMEs. Given the complexity of undertaking an impact assessment on VMEs, the MSC expects that most UoAs will choose to apply the simpler approach of avoiding VMEs.

The partial strategy should include a mechanism by which to consider a habitat that might be a VME (i.e., designated as a "potential VME" by another MSC UoA or a management authority). Since the characteristics of a VME are not directly physical features but relate to a number of different elements ([GSA3.13.3.2](#)) as well as recoverability, a VME is often difficult to determine. Therefore, a management system should be open to the possibility that habitats that contain high densities of VME-indicator organisms may or may not be VMEs, and a habitat's VME status will need to be determined by subsequent research. However, the appropriate precautionary approach is to treat these areas as potential VMEs and to implement precautionary measures to protect them ahead of confirmatory evidence, as outlined in the FAO Guidelines paragraphs 63-67.

A common precautionary response to the presence of VMEs is to develop avoidance measures (e.g., move-on rules) with the intention that the UoA is able to avoid any further encounter with VMEs or potential VMEs. This response ensures that serious and irreversible harm is avoided.

The minimal VME damage that occurs when a move-on rule is triggered does not constitute serious or irreversible harm even when a VME habitat is below 80% of its unimpacted level.

Reviews of move-on rules (e.g., ICES, 2010²⁰; Rogers and Gianni, 2010²¹; Weaver et al., 2011²²) have detected the following frequent problems:

- There is limited or no scientific basis on whether the thresholds used for move-on rules are indicative of VMEs and often they are not specific to different gears, species, or habitat and do not identify an effective move-on distance.
- In cases where the move-on distance is small, the effect may simply be to increase damage to VMEs.
- The materials necessary to help observers and fishers identify and quantify VME taxa are inadequate and/or not standardised.
- Good information collection, including vessel monitoring systems (VMS) and automatic identification systems (AIS), and full observer coverage is often needed to apply the move-on rules correctly.

In acknowledgement of this, [SA3.14.2.2](#) requires that at the SG80 level, the move-on rules be scientifically based and specific to the gear and VME. Therefore, at the SG80 level, some justification for the use of a specific move-on rule is expected, whereas at the SG60 level, a commonly accepted, default rule could be used.

The lifting of a closure implemented using a move-on rule should be based on a high level of scientific evidence to identify conservation and management measures that prevent significant adverse impacts to VMEs. Note that because a comprehensive impact assessment has not been done at this level of performance, effectively all VMEs and potential VMEs should be afforded some level of precautionary protection.

A partial strategy for a UoA using a pelagic gear or a low-impacting bottom gear (e.g., a gear footprint score of 1 in Table PF16) may not need to include requirements and implementations (as per [SA3.14.2.2](#)). The team should provide rationale in those cases. The team may find it useful to refer to the pelagic examples in [Table GSA8](#).

GSA3.14.2.3 ▲

At the SG60 level, commonly accepted move-on rules can be used as “Measures”. These may be rules that are used for the same gear in other situations or in other areas of the world but that have not been specifically designed for the UoA’s gear and/or encountered VMEs.

²⁰ ICES, 2010. *Report of the ICES/NAFO joint working group on deep-water ecology (WGDEC), 22–26 March 2010, Copenhagen, Denmark*. ICES CM 2010/ACOM:26, 160 pp.

²¹ Rogers, A.D. and Gianni, M., 2010. *The implementation of UNGA Resolutions 61/105 and 64/72 in the management of deep-sea fisheries on the high seas*. Report prepared for the Deep-Sea Conservation Coalition, International Programme on the State of the Ocean, London, United Kingdom, 97 pp.

²² Weaver, P.P.E., Benn, A., Arana, P.M., Ardron, J.A., Bailey, D.M., Baker, K., Billett, D.S.M., Clark, M.R., Davies, A.J., Durán Muñoz, P., Fuller, S.D., Gianni, M., Grehan, A.J., Guinotte, J., Kenny, A., Koslow, J.A., Morato, T., Penney, A.J., Perez, J.A.A., Priede, I.G., Rogers, A.D., Santos, R.S., and Watling, L., 2011. *The impact of deep-sea fisheries and implementation of the UNGA Resolutions 61/105 and 64/72*. Report of an international scientific workshop, National Oceanography Centre, Southampton, 45 pp.

Table GSA8: Potential measures, partial strategies, and strategies in relation to habitat impacts

Examples of potential measures, partial strategies, and strategies in relation to habitat impacts (modified from Grieve et al., 2011²³)

General UoA description	Rationale		
	Measures	Partial strategy	Strategy
Cod UoA using fixed gear (e.g., gillnets) in inshore zones and mobile gear (e.g., otter trawl) in offshore zones – There are some closed areas and closed seasons for specific gears in either or both the inshore and offshore zones, though these are primarily stock and bycatch management measures. Some habitat protection is afforded by these management arrangements. Monitoring and information gathering efforts are directed at species management arrangements.	✓		

²³ Grieve, C., Brady, D.C. and Polet, H., 2011. *Best practices for managing, measuring, and mitigating the benthic impacts of fishing: final report to the Marine Stewardship Council*. Unpublished work.

<p>Multi-species trawl UoA in inshore tropical waters – Trawling is banned in inshore waters during the seasonal monsoon to protect juvenile and spawning habitat for fish and invertebrate species.</p>	<p>✓</p>		<p>The seasonal closure can be considered an individual tool or action that seeks to explicitly protect juvenile and spawning habitat despite being designed to enhance the sustainability of species of interest. However, there is little evidence to suggest that impacts of the arrangement are investigated to determine whether or not habitat protection is occurring or to understand how the measure works to achieve habitat protection; nor are there any other measures, plans, or statutes that would determine how managers would change the seasonal closure if it ceased to be effective from a habitat perspective.</p>
<p>Groundfish trawl UoA in offshore zones with explicit links to other species/multi-gear management plans – Some closed areas within the groundfish UoA prohibit use of any bottom-contacting fishing gear. Non-UoA (i.e., environmental protection-led) regulations designate two habitat areas of concern, which are also closed to bottom-contacting fishing gear. Vessel monitoring systems and other enforcement efforts aim to ensure no violation of closed or protected areas. Information gathering seeks to monitor the protected zones, and fishing impacts are considered in subsequent analyses. Arrangements about the use or otherwise of bottom-contacting gear have changed according to shifting distributions of benthic species of interest to the other UoAs.</p>		<p>✓</p>	<p>There is a clear multi-species management approach with the linking of species/gear management plans. The closed areas indirectly contribute to the management of habitats for the groundfish UoA, though they were established to protect the stocks of other sessile target species (e.g., scallops). The habitat protection zones, though designed for broader conservation purposes, serve to protect habitats of concern. The arrangements could be considered cohesive, particularly as there is evidence of strict enforcement of the protection zones and closed areas, coupled with high sanctions imposed for violators. Similarly, there are some efforts to understand how bottom-contacting gear might impact other benthic biota, but these are aimed at interests other than those in the UoA. The closed areas and protection zones were not designed specifically to manage habitats in relation to the groundfish UoA, nor are there specific mechanisms described that would enable managers to appropriately modify fishing practices if unacceptable impacts to habitats were identified.</p>
<p>Co-managed and community-based managed tropical UoAs using multiple gears on a diverse range of habitats – Under a broad</p>		<p>✓</p>	<p>There is science-based rationale for protecting the habitats as spawning, larval, or juvenile areas for the sustainability of fish species.</p>

<p>marine management area, which was not specifically designed to manage fishing but general community uses of the marine environment, protection is afforded to a mosaic or patchwork of seagrass, mangrove, and coral reef habitats where bottom-contacting gear use is restricted or banned altogether. The cultural context and scale of the various UoAs lend themselves to the community-based management approach.</p>			<p>The arrangements are cohesive, comprising several measures that indirectly protect habitats for biodiversity purposes. There is some understanding of how this works to protect habitats and a demonstrable awareness of the need to change measures if they stop being effective from a habitats perspective. While the management approach is not explicitly designed to manage fishing impacts on habitats, there is a functioning management framework (although not strictly speaking “regulatory”) that suggests UoAs in the area do not cause serious or irreversible harm to habitats. There are some efforts aimed at understanding how specific strategies might work in relation to the various habitats impacted by the community’s fishing. Despite the cultural context and relatively small scale of individual UoAs, the total approach does not add up to a “strategy” within a functioning regulatory framework that is directed specifically at management of habitat impacts of the UoA or other MSC UoAs.</p>
<p>Midwater trawl UoA on continental slope where some seamounts are encountered and rare bottom-contact is made – In acknowledgement that these features can be considered VMEs, some seamounts are afforded strict protection from any bottom-contacting gears, including midwater trawl gear, and there is a complete ban on the use of bottom/otter trawl gear on all seamounts. This gear restriction constitutes the key part of the UoA management strategy.</p>		<p>✓</p>	<p>The strategy is cohesive by virtue of permitting only midwater trawling on any seamount in the region. The functioning regulatory framework is explicit with the ban on bottom-contacting gear on all seamounts and as such represents a precautionary approach. Other MSC UoAs are also required to comply with these rules. Managers have implemented a mechanism to avoid contact with VMEs (seamounts) by mandating the use of only non-bottom contact gears. However, while the strategy is designed to avoid serious or irreversible harm to these VMEs, it can only be considered a partial strategy as it relies upon the generally accepted rarity of bottom contact by midwater trawls and other gears rather than an explicit means of understanding the effectiveness of the management approach in ensuring that serious and irreversible harm is not</p>

				happening to seamounts or the mechanism that might need to be in place if it ceases to be effective.
Demersal trawl UoA in inshore and offshore areas – Overarching management framework takes an ecosystem-based fisheries management approach involving impact assessments for management plans (including impacts on habitats), spatial controls like closures to protect essential fish habitat, effort reduction rules, and buyout/lease-back arrangements incentivising the use of less bottom-contacting gear to catch fish quotas.			✓	Management is cohesive and strategically aimed at managing the impacts of the UoA, other MSC UoAs, and non-MSC fisheries on relevant habitats within a comprehensive ecosystem-based management plan. There are a suite of measures and tools available and evidence of their use. Ecological risk and impact assessments have been carried out and have determined that all fishing activity will not cause serious or irreversible harm to habitats, including VMEs. There is active management seeking to reduce the impact of the UoA on both essential fish habitat and other habitats that were rated higher risk from an ecosystem-management perspective, including VMEs. The management plan has clearly articulated objectives relating to the Habitats component and sets out how management will be modified if undesirable impacts are detected. Monitoring and evaluation are enshrined within the management plan and are directed at understanding fishing impacts on habitats, as well as the usual species-related monitoring and evaluation. Explicit strategies aim to manage the cumulative impacts of fishing, by the UoA, other MSC UoAs, and non-MSC fisheries, on “main” habitats so as to avoid serious or irreversible harm.
Multiple UoAs targeting mixed-species complexes using multiple gears (bottom- and non-bottom-contacting gears, including hand rakes, dredges, trawl gear, gillnets, and trap and line methods) in inshore and offshore environments ranging from cool temperate waters to warm tropical seas – A bioregional marine planning framework uses an ecosystem-based fisheries management approach involving ecological risk assessments and risk management planning for fish. Precautionary management approach to risks identified for			✓	Management is cohesive and strategic, aimed specifically at managing fishing impacts on species, habitats, and other ecosystem components within a comprehensive management plan. Several measures are in place, and research, monitoring, and evaluation are aimed at understanding the impacts of the UoA on habitats. Management strategies (e.g., plans) contain explicit mechanisms for modifying fishing practices based on unacceptable impacts coming to light through research, monitoring, or evaluation. There is evidence

<p>habitats includes closed areas for a variety of gears (that may change from year to year) and a system of marine protected areas, offering more permanent protection from any bottom-contacting gears. Habitat mapping and strategic research planning and execution are progressively closing the information gaps on the impacts of fishing on habitats, as well as the relative health of relevant habitats. Results are routinely used to inform fishery management decisions.</p>			<p>these have been implemented to modify fishing impacts on relevant habitats. As this is one of the most comprehensive and cohesive management approaches, “main” habitats, including VMEs, and cumulative impacts are explicitly considered by managers in the risk assessment and management process, the research strategy, and the management decision-making processes.</p>
<p>Pelagic longline UoA targeting migratory pelagic species – There is little or no known bottom-contact by the gear, except perhaps in cases of gear loss. The species targeted cannot be caught using trawl or other bottom-contacting gear.</p>		<p>✓</p>	<p>The use of the gear, the understanding that comes from years of peer-reviewed research about its impacts, and the specific management strategy that mandates only its use could be construed as a cohesive and strategic arrangement. This is supported by demonstrable understanding about how the use of pelagic longlines work to avoid impacting benthic habitats specifically, and some understanding about the impacts of lost gear on habitat and the relative effects of such impacts are deemed to be low risk for overall habitat health. Periodic assessments (i.e., directed research and risk assessments) are undertaken to inform management decision makers about lost-gear impacts to ensure that management strategies are working and are demonstrably avoiding serious or irreversible harm to “main” habitats and to determine whether changes need to be made to mitigate unacceptable impacts.</p>

GSA3.14.3 ▲

If there is no impact on a VME (i.e., either by the UoA, another MSC UoA, or a non-MSC fishery, where relevant – see [SA3.14.3.2](#) and the [associated guidance](#)), scoring issue (d) is not scored.

GSA3.14.3.2 ▲

An MSC UoA needs to have some way of assessing whether the actions of all MSC UoAs and other non-MSC fisheries, where relevant, are applicable to it avoiding impacts on VMEs. For instance, a “precautionary VME closure” might be declared by a trawl UoA on triggering a move-on rule, and MSC UoAs impacting in that closure area would be required to respect this closure under the requirements of the management PI 2.4.2. However, other measures, such as changing to a semi-pelagic gear, may not be relevant or appropriate for other MSC UoAs.

When an MSC UoA/non-MSC fishery closes an area for reasons other than VME conservation (e.g., for operational reasons to gain a market advantage), other MSC UoAs need not abide by such a closure.

GSA3.14.4 ▲

For scoring issue (d), the team should be able to demonstrate that, where appropriate, area protection is respected; that move-on rules are applied appropriately; and that information from all MSC UoAs and non-MSC fisheries, where this information is available and relevant, on likely areas of VMEs is being handled correctly by the UoA.

In addition to VMS and AIS, electronic monitoring might include data taken from chart plotters, mobile phone signal triangulation, on-deck CCTV, and net-mounted camera systems as long as these can be externally verified.

“Qualitative evidence” should include results from non-verified surveys and/or stakeholder interviews to confirm that management requirements (including move-on rules) are applied effectively. The expectation at the SG60 level is that the UoA avoids all areas closed by its management entity and those closed by the UoA’s own move-on rules.

“Some quantitative evidence” at the SG80 level should include verified electronic data or some other method of external verification (e.g., observer coverage, inspections) consistent with the scale and intensity of the UoA to confirm that management requirements are applied effectively.

“Clear quantitative evidence” at the SG100 level should include verified electronic data and some other method of external verification consistent with the scale and intensity of the UoA to confirm that management requirements are applied effectively. The expectation at the SG80 and SG100 levels is that the UoA additionally respects the areas closed by all MSC UoAs and non-MSC fisheries to ensure the cumulative protection of VMEs.

Observer programmes and inspection programmes may be used depending on the scale and intensity of the UoA. That is, for a small-scale developing-world UoA operating gear with a likely small impact on VMEs, it may be acceptable to use chart plot information supported by occasional inspections, whereas for a large-scale industrial UoA operating gear with a likely large impact on VMEs, it would normally be necessary at the SG80 level to operate VMS or AIS systems together with significant observer coverage.

GSA3.15 Habitats information PI (PI 2.4.3) ▲

Assessing informal approaches against PI 2.4.3

Teams should consider whether qualitative and/or quantitative information is available to understand the distribution of habitat and the impact of the UoA on habitat. The assessment

should factor in the likelihood of changes within the UoA that could potentially lead to an increase in the risk of impact from fishing activity over time.

Teams should further consider whether information is collected to detect these changes to ensure that the UoA is moving in the desired direction or operating at a low-risk level.

Information may be from local knowledge or research from fishers or community members. It may be place-based (i.e., local to a particular geographical area) and may have social, economic, or ecological dimensions. It will reflect the knowledge and opinions about issues held by individuals and groups local to the UoA. Local knowledge can be valuable first-hand experience that might provide information on a wide range of topics, including habitat distribution and range, gear impacts on local habitats, gear and UoA spatial overlap with habitats, and scale and intensity of the UoA. Depending on the scale of the UoA, this information could be collected through informal stakeholder processes or a less subjective review process.

Guidance on scoring issue (c) – Monitoring ▲

When scoring issue (c) at the SG80 level, the team should consider all potential increases in risk, such as changes in the scoring of the outcome PI, in the operation of the UoA, or in the effectiveness of the measures.

GSA3.15.2 ▲

See guidance [GSA3.13.3.1](#) and [GSA3.13.3.2](#).

GSA3.15.3 ▲

If the CSA is used to score the outcome PI for any scoring element, the team is required to evaluate scoring issues (a) and (b) using the RBF alternative at the SG60 and SG80 levels for that scoring element.

GSA3.16 Ecosystem outcome PI (PI 2.5.1) ▲

Background

The Ecosystem component considers the broad ecological community and ecosystem in which the fishery operates. The Ecosystem component does not repeat the status assessment of the other components individually but rather considers the wider system structure and function – although if all these components scored highly it might be expected that the Ecosystem component would also score highly. The Ecosystem component addresses system-wide issues, primarily impacted indirectly by the fishery, including ecosystem structure, trophic relationships and biodiversity.

GSA3.16.2

PI 2.5.1 requires that “the fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.” Please refer to [Table SA8](#) and [Table GSA2](#) for more details on such harm. Assessments of the risks of “serious or irreversible harm” to the ecosystem in PI 2.5.1 may be made in reference to the maximum levels of impacts

allowed under [SA2.2.13.b](#). While P1 scores the setting of TRPs and the theoretical evidence that they will achieve the allowed impact levels, PI 2.5.1 scores the evidence that such levels are being achieved in practice.

Serious or irreversible harm in relation to the capacity of the ecosystem to deliver ecosystem services could include:

- Trophic cascade (i.e., significantly increased abundance, and especially decreased diversity, of species low in the food web) caused by depletion of predators and especially 'keystone' predators;
- Depletion of top predators and trophic cascade through lower trophic levels caused by depletion of key prey species in 'wasp-waist' food webs;
- Severely truncated size composition of the ecological community (e.g., greatly elevated intercept and steepened gradient in the community size spectrum) to the extent that recovery would be very slow due to the increased predation of intermediate-sized predators;
- Gross changes in the species diversity of the ecological community (e.g., loss of species, major changes in species evenness and dominance) caused by direct or indirect effects of fishing (e.g., discarding which provides food for scavenging species);
- Change in genetic diversity of species caused by selective fishing and resulting in genetically determined change in demographic parameters (e.g., growth, reproductive output).

Relatively few fisheries would have the information needed to address ecosystem issues quantitatively, and usually they will be assessed using surrogates, analogy, general observations, qualitative assessment and expert judgement. Harm to ecosystem structure is normally inferred from impacts on populations, species and functional groups, which can often be measured directly. Harm to ecosystem functions is normally inferred from impacts on ecosystem processes and properties such as trophic relationships, community resilience etc. and often have to be inferred from conceptual or analytical models or analyses.

GSA3.17 Ecosystem management strategy PI (PI 2.5.2) ▲

Refer to [Table SA7](#) and [Table GSA2](#) for more details on 'measures'

GSA3.18 Ecosystem information/ monitoring PI (PI 2.5.3)

GSA3.18.1 ▲

Key ecosystem elements may include trophic structure and function (in particular key prey, predators, and competitors), community composition, productivity pattern (e.g., upwelling or spring bloom, abyssal, etc.), and characteristics of biodiversity.

GSA3.19 References

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GSA4 Principle 3

GSA4.1 General requirements for Principle 3 ▲

Background

The intent of Principle 3 (P3) is to ensure that there is an institutional and operational framework appropriate to the size and scale of the UoA for implementing Principles 1 and 2, and that this framework is capable of delivering sustainable fisheries in accordance with the outcomes articulated in these Principles. The P3 default tree structure divides the PIs into two components as shown in [Figure SA3](#) in Annex SA of the FCR and summarised below.

Table GSA9: P3 PI component descriptions

Component	PIs	Focus	Description
'Governance and Policy'	3.1.1 3.1.2 3.1.3	Captures the broad, high-level context of the fishery management system within which the UoA is found.	Performance elements within this component include: <ul style="list-style-type: none"> • The overarching legal and/or customary framework for the UoA, which may include fisheries that are subject to international cooperation for management of the stock, or other fisheries under the same management framework. • the consultation processes and policies; • the articulation of the roles and responsibilities of people and organisations within the overarching management system; • other overarching policies supporting fisheries management.
'Fishery Specific Management System'	3.2.1 3.2.2 3.2.3 3.2.4	Focuses the team on the management system directly applied to the fishery. The focus should be on the management system of the fishery, which for some fisheries will include both national and international components.	PIs under this component consider: <ul style="list-style-type: none"> • the fishery-specific management objectives (i.e., fishery management objectives for the fishery, specifically); • the decision-making processes in the relevant fishery; • the fishery's compliance and enforcement system and implementation; • evaluation of the performance of the fishery's management system.

A MSC UoA might include only a sub-set of fishers (vessels, fleet operators, and individual fishermen) within a wider fleet of fishers fishing for the same biologically distinct stock, using the same method, under the same or similar management system or arrangements. However, teams should note that it is the management of the wider fleet which denotes the specific "fishery" that is the subject of assessment under the fishery-specific management system PIs. Special or additional management arrangements or features unique to the

vessels in the UoA may be considered and reflected in the scores under the fishery-specific management system PIs.

Example:

In some Regional Fisheries Management Organisations (RFMOs), compliance can be the responsibility of a Compliance Committee, and sanctions can be brought by the RFMO itself (e.g., through loss of access to resources, such as when a Member's vessel is identified as IUU, or loss of access by a Member itself) through its negotiation process, or by the Flag State of the vessel having the violation. If a violation is not in any way under the control of the national management authority of the fishery (e.g., if the fishery consists of vessels registered with flag state X, and the non-compliance is by vessels registered with flag state Y), its internal compliance should not be part of the assessment (i.e., in the previous example the fishery consisting of vessels from flag state X should not be held responsible for the non-compliance of flag state Y vessels). However, the effectiveness of actions at the national level (i.e., the compliance of flag state X vessels) and the RFMO level (the overall effectiveness of compliance to deliver sustainable outcomes) should be considered.

GSA4.1.1 Assessment of multi-level management systems ▲

In order to effectively assess multi-level the management systems against Principle 3, the assessment team should determine which biological and/or jurisdictional levels apply to the management system of this UoA. These levels of management should then be considered for all PIs within the relevant P3 component.

Table GSA10: Examples of types of jurisdiction for different management systems

Type of Jurisdiction	Management system
Purely domestic fishery	The fishery management framework may exist at a local, regional or national scale within the jurisdiction of a single State. Additionally, a purely domestic UoA may exist in multiple jurisdictions within a State, for example under a Federal system of government
Trans-boundary fish stocks, straddling fish stocks, stocks of highly migratory fish species and discrete high seas fish stocks	Are exploited by two or more States, international law becomes relevant. These multi-level management systems may have a variety of jurisdictional arrangements that might apply to that UoA and are therefore required to be considered by the assessment team.

GSA4.1.3 ▲

Under international law, as set out in the UN Convention on the Law of the Sea (UNCLOS) and related instruments, the States concerned, including the relevant coastal States in the case of shared stocks, straddling stocks, and highly migratory species, are required to cooperate to ensure effective conservation and management of the resources.

The relevant instruments that set out these requirements are:

- United Nations Convention on the Law of the Sea (UNCLOS), 1982;
- United Nations Agreement for the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995 (UNFSA);
- FAO Code of Conduct for Responsible Fisheries, 1995 (including the FAO Compliance Agreement of 1993).

The MSC considers UNFSA Article 10 and the UNCLOS requirements as a basis for MSC requirements relating to cooperation for UoAs that are subject to international cooperation for management of the stock. These requirements to cooperate should apply to UoA participants even if cooperation is not formally required by the relevant RFMO/RFMA or if an RFMO/RFMA does not exist. These requirements should also apply to UoAs in the high seas even if the target species are not HMS or shared or straddling stocks and are not formally covered by the UNFSA requirements. The requirement is further elaborated in [SA4.3.1–SA4.3.4](#).

The intent is to limit the extent of responsibility of the UoA for the actions of non-UoA management bodies, unless they impact directly on the delivery of P1 and P2 outcomes.

GSA4.1.4 Traditionally managed ▲

A key characteristic of management mechanisms and measures in traditionally managed or self-governing UoAs is that they may be undocumented or may not be formally ratified.

The CAB could use semi-structured interviews with a range of stakeholders or other participatory tools to collect information. The information in the sample should be representative of the reality of the UoA.

Multiple stakeholder participatory approaches can be used to cross check opinions and views from different segments of the stakeholder community.

Both of the above could be used by the CAB to support the rationale and validate the conclusions provided for the scores as required in clauses under [SA4.3](#).

GSA4.3 Legal and/or Customary Framework PI (PI 3.1.1) ▲

Background

Understanding what is meant by the legal and/or customary framework is key to determining if fisheries management occurs within a framework that both respects relevant laws and is compatible with relevant instruments of international law capable of delivering sustainable fisheries in accordance with P1 and P2.

A fishery management system's local, regional, national or international legal and/or customary framework is:

- The underlying formal or informal supporting structure that incorporates all the formal and informal practices;
- Procedures and instruments that control or have an impact on a UoA. This includes policies and practices of both government and private sectors, including (but not limited to):
 - Implementing agencies (e.g., fisheries agencies, conservation agencies);

- Fishery business groups (e.g., catch sector cooperatives, industry associations);
 - Fishing vessel owners;
 - Indigenous groups;
 - Local civil society or community groups.
- The government sector, including all applicable government systems, the courts and the relevant parliamentary and regulatory bodies. The management system is the complex interaction of government legislation, or industry or customary practice, but is not limited to all such elements, controls and practices that are used in a UoA and result in “hard” (law) or “soft” (accepted practice) controls over actual on-water catching practices.

Assessing informal and traditional approaches

In all scoring issues in this PI, for management systems which are less clearly articulated, such as informal and traditional management systems, evidence of the extent to which this scoring issue is met could be through:

- Accepted norms;
- Commonly held values;
- Beliefs and/or
- Agreed rules across the fishing communities of which the UoA is part.

Scoring issue (a) – Compatibility of laws or standards with effective management ▲

The first scoring issue for this PI relates to the presence or absence of an appropriate and effective legal system, including at the international level a legal and/or customary framework that is capable of delivering sustainable fisheries in accordance with P1 and P2. To score this part of the PI, assessment teams should focus on the existence of a national and/or international framework itself and if it is capable of delivering sustainable fisheries, including through management cooperation where required.

This may be determined by examining:

- The presence or absence of the essential features of an appropriate and effective structure within which management takes place;
- If those features are hard or soft;
- If the framework has a focus on long term management rather the short term;
- How it manages risk and uncertainty;
- If the framework is transparent and open to scrutiny, review and adaptation as new information becomes available.

The essential features needed to deliver sustainable fisheries are defined by their relevance to achieving sustainable fisheries in accordance with P1 and P2 appropriate to the size and scale of the UoA, and may include:

- Establishing when and where people can fish;
- Who can fish;
- How they may fish;
- How much they can catch;

- What they can catch;
- Who they talk to about the “rules” for fishing;
- How they might gather relevant information and decide what to do with it;
- How they know that people are abiding by whatever rules are made and
- How they catch, sanction or penalise wrongdoers.

With these features, the operational framework could be said to be compatible with local, national or international laws or standards.

Scoring issue (b) – Resolution of disputes ▲

Issues and disputes involving allocation of quota and access to marine resources are outside the scope of an assessment against the MSC Fisheries Standard.

When there are no immediately obvious structures for dispute resolution, participatory techniques could be used to:

- Identify and evaluate the presence of dispute resolution mechanisms used in the UoA;
- Obtain information on these dispute mechanisms;
- Assess the effectiveness of such mechanisms.

To minimise the likelihood of subjectivity, assessment teams should include participants and/or interviewees from a wide variety of stakeholder types and from stakeholders operating outside the UoA. Fishers may be able to draw up charts or use other visual or non-textual means to help explain or demonstrate the process for resolving conflicts in the UoA.

The level of transparency and effectiveness of the systems can be determined by:

- Information on the proportion of stakeholders that are aware of the existence of any dispute resolution arrangements;
- The history and stories of how disputes have been dealt with in the past;
- Ascertaining whether the presence or absence of unresolved disputes can be considered significant indicators of the existence and/or effectiveness of dispute resolution mechanisms.

Evidence of consistency with this requirement can be determined by using field observations and structured interviews with fishers and fishing community leaders to ascertain the following:

- The extent to which fishery participants are aware of established rights;
- Responses in the past within the UoA to disputes over established rights;
- Accepted norms and practice across the UoA that is supportive of such established rights.

GSA4.3.2.3 Cooperation ▲

With respect to UNFSA Article 10, the requirement under SG60 ([SA4.3.2](#)) extends to the generation of scientific advice, not its implementation (Article 10 paragraphs d, e, f, g). A framework for cooperation with other parties could include for example the ability for parties to coordinate scientific advice to respective management agencies. At SG60 it is expected that the flag state(s) of vessels from the UoA will be participating with a relevant RFMO at least as a cooperating non-contracting party or cooperating non-member.

GSA4.3.3.2 ▲

At SG80, organized and effective cooperation with other parties extends to UNFSA Article 10 paragraphs a, h and j, and could include for example the establishment of appropriate cooperative mechanisms for effective monitoring, control, surveillance and enforcement. Also at SG80 and SG100 the flag state(s) of vessels from the UoA should be participating with a relevant RFMO or other arrangement as Members or, if Membership is prohibited for political reasons, as cooperating non-contracting party or cooperating non-member.

GSA4.3.4 ▲

At SG100, binding procedures governing cooperation with other parties could include for example the agreement and compliance with conservation and management measures, to ensure the long-term sustainability of straddling fish stocks and highly migratory fish stocks.

GSA4.3.5.1 ▲

These practices or procedures could be formalised under rule of law, or be informal but known through traditional or customary means.

GSA4.3.6 ▲

Decisions of legislatures (through statutes or national treaties relating to aboriginal or indigenous people), or courts will establish if rights have been conferred upon any particular group or individual. The main consideration in relation to performance against scoring issue (c) is whether a suitable framework exists or does not exist to address the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood, not on the effectiveness or results (e.g., allocation of access) of such a framework.

GSA4.4 Consultation, roles and responsibilities PI (PI 3.1.2) ▲

Background

Assessment teams may include consideration of the roles and responsibilities of the fishers in relation to their cooperation with the collection of relevant information and data (e.g., catch, discard, and other information of importance to the effective management of the resources and the UoA), where relevant and/or necessary, in scoring this PI.

Scoring Issue (a) – Roles and responsibilities: Assessing informal and traditional approaches ▲

In some traditionally managed UoAs or UoAs under self-governance, specific roles and responsibilities may not always be clearly articulated or immediately apparent. This does not mean that different institutions or organisations do not undertake specific and agreed roles. A range of entities, ad-hoc committees and other groups with a variety of labels including NGOs may have responsibility for different fishery management roles. The arrangements may not be formally codified but may be widely understood across the UoA.

To verify the extent to which roles and responsibilities are defined across the management system, CABs may need to work with stakeholders to prepare simple governance, institutional or system maps.

The maps can provide a visual representation of the different groups and organisations involved in the UoA, how they function, which aspects of the management process they are responsible for, and how they relate to one another.

Scoring issue (b) – Consultation processes ▲

The main point of scoring issue (b) is that the management system is open to stakeholders and that any information that is viewed as important by those parties can be fed into and be considered by the process in a way that is transparent to the interested stakeholders.

GSA4.4.1 Transparency ▲

SG80 and SG100 under scoring issue (b) introduce the added elements of demonstrating that whatever information is gathered, it is considered and that there is transparency about its use or lack of use.

SG100's demonstration may not necessarily be additional reporting beyond what may already occur in a fishery management system. Examples include:

- Regular newsletters, broadcasts or reports that go out to stakeholders;
- Information pages published and distributed;
- A public record of the minutes of meetings (including use of email or other e-technologies);
- If dealing with stakeholders who don't have access or ability to read reports, watch broadcasts or use computers there may be report back meetings or other such means to report what happened.

Teams will need to be satisfied that what evidence is offered does meet the standard of demonstrating consideration of the information (i.e., being transparent) and also explains how the information was or was not used. A UoA cannot score 100 without being transparent on how information provided is or is not used.

GSA4.4.3 – GSA4.4.4 Effectiveness ▲

Evaluation of effectiveness of consultation processes might consider the general absence of discrimination against any individuals and/or organisations from any known consultations as part of the measure of performance against this scoring issue. However, any such conclusions need to be supported by valid information collected by rigorous and robust means.

Effective consultation processes within the management system must be appropriate to the scale, intensity and cultural context of the UoA. For example, but importantly not confined to, consultation at the level of broad policy development and at the level of research planning.

Affected parties, depending on the context, may include but are not limited to individuals, mandated representatives, and/or participants in the UoA.

In multinational arrangements there should be adequate consultation at the UoAs' national and international level. Thus the management authority dealing with the UoA directly (e.g., the coastal State or the Flag State) and the international organisation, where such exists,

should be assessed for consultation requirements. It is not a requirement that elements are scored against this PI for other non-UoA States which are members of the international organisation, or members of a bilateral/multilateral arrangement.

Assessing informal and traditional approaches

In the absence of a documented consultation procedure, evidence to verify the extent and transparency of consultation processes can be demonstrated by alternative means.

This can include identifying the existence, content and relative frequency of invitation letters to meetings. It can also include a consideration of activities of UoAs' extension officers, how well local announcements are used, the use of posters, and the extent of awareness of fishers about meeting agendas, meeting content and outcomes.

CABs may need to interview fishers about selected case studies to determine how information collected from stakeholders has been used in the past.

Information from such interviews may be considered representative of how the information collected from stakeholders is generally used, providing the CABs demonstrate that valid and rigorous methods were used. Conducting interviews with different stakeholder and cross checking the information is one way of validating the results.

GSA4.4.5 Local knowledge ▲

Local knowledge may be long-term knowledge held by many fishers or the community. It might be location-based (i.e., local to a particular geographical area), and may have social, economic or ecological dimensions. It will reflect the knowledge and opinions about issues held by individuals and groups local to relevant UoAs. Local knowledge can be valuable first-hand experience that might inform any fisheries management process, including fisheries research, data collection and resource assessment, monitoring, control and surveillance operations, policies and processes, and fisheries management policies, practices and/or decisions.

Evaluation of the relative value and robustness of local knowledge in the management process may form part of the process of being transparent about how information is considered and used or not used under SG80 and SG100.

Individuals or groups as referred to in SA4.4.5 could include, but not be limited to, fishers, indigenous people, local community representatives or groups, local civil society groups like local NGOs, local fishing businesses and/or their representatives, local government representatives or politicians.

GSA4.5 Long term objectives PI (PI 3.1.3) ▲

Background

The emphasis of this PI is on the presence or absence of long term objectives at the broader management level, i.e., the objectives of the management agency for all UoAs under its control. Where UoAs fall under dual control (e.g., internationally managed UoAs where management falls to both a national agency and a bilateral/multilateral agreement or organisation, or federally managed UoAs which have some provincial or state management component), the subject of PI 3.1.3 should be the wider organisation.

This PI deals only with the broader management policy context – perhaps within overarching legislation, or perhaps policy or custom that applies to many or all UoAs within a broader management system. Consideration should focus on whether laws, policies, practices or

customs at that higher level imply and/or require long term objectives that are consistent with the precautionary approach.

Scoring issue (a) – Objectives assessing informal approaches in PI 3.1.3 ▲

Within the scoring issue in this PI, the CAB could infer consistency with requirements in scoring issue (a) by the practices operating within the UoAs covered by the management system.

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.

The CAB should consider if decisions have been taken on the basis of the ecological health of the UoA and associated ecosystems, or for other reasons that are not compatible with achieving sustainability over the long term.

Scoring should focus on the consistency of any long-term objectives within overarching management policy with the notions of being cautious when information is uncertain, and taking action even when information is inadequate.

The definition of the precautionary approach given in the MSC-MSCI vocabulary was derived from Article 6, UN Agreement for the implementation of the provisions of UNCLOS of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks; also known as the “Fish Stocks Agreement”.

This PI forms an important part of the overall understanding of the use or otherwise of a precautionary approach in the UoA but is not concerned with the operational implementation of the precautionary approach within the ‘day-to-day’ management of the UoA itself. This PI is not a second opportunity to score UoAs on the use or otherwise of target and limit reference points which are scored under P1 of the default tree, nor to point teams towards Article 6, Annex II of the Fish Stocks Agreement for a prescriptive list of what must appear in management policy in relation to the precautionary approach. It is also not a direction to re-score management strategies or outcomes covered both in P1 and P2, or decision-making processes covered in a separate PI under P3 where precaution and the precautionary approach are also mentioned.

GSA4.7 Fishery-specific objectives PI (PI 3.2.1) ▲

Background

This PI deals only with the fishery-specific policy context, such as within national or provincial/state or joint authority policy or custom, specifically applied to the fishery as set out in [GSA 4.1](#).

Scoring issue (a) – Objectives Assessing informal and traditional approaches ▲

In some traditionally managed fisheries, or fisheries under self-governance, objectives may not always be stated quantitatively or be expressed specific to the particular species or fishery. Objectives may specify social and/or economic objectives. In some fisheries,

objectives may be defined in terms of addressing further declines, rather than specifically maintaining optimum yields or biomass levels.

Compliance of the fishery with MSC requirements can be determined by how well these variously formulated objectives align with achieving sustainability as expressed by MSC Principles 1 and 2. Objectives that are defined to meet social needs may in some cases be consistent with achieving sustainability as articulated in Principles 1 and 2. However, to be considered as consistent with achieving sustainability, such objectives should not be designed to meet social needs at the expense of ecological considerations.

In evaluating such objectives for consistency with achieving outcomes in Principles 1 and 2, the CAB needs to determine if the fishery is subject to considerations which may lead the emphasis on social or economic objectives to pose potential risks to achieving the outcomes required by Principles 1 and 2.

GSA4.7.2 ▲

Example:

An example of an explicit measurable objective is “the impact on dependent predators will be reduced by x% over y years”.

GSA4.8 Decision-Making Processes PI (PI 3.2.2) ▲

Background

The focus for this PI is on the decision-making processes themselves, and if they actually produce measures and strategies **within the fishery-specific management system**. It is not an evaluation of the quality of those measures and strategies as this is covered elsewhere in the tree structure under P1 and P2. SG60, SG80 and SG100 refer to decision-making processes taking account of the wider implications of decisions. This 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.

Scoring issue (a) –Objectives Assessing informal and traditional approaches ▲

“Established” decision-making processes should be understood to mean that there is a process that can be immediately triggered for fisheries-related issues, the process has been triggered in the past and has led to decisions about sustainability in the fishery. These processes may or may not be formally documented or codified under an official statute.

Key considerations for assessing whether the system is well-established or not include the extent to which the system is recognised by stakeholders in the fishery and the durability or permanency of the decision-making process.

CABs may need to use semi-structured interviews with a range of stakeholders to obtain information about how any decision-making process works. This may involve selecting a case study event (e.g., stock decline in the past, a specific observation across the fishery or other ecological change) and determining from interviews if, and how decisions were made in response to the event. As with general requirements relating to the use of semi-structured

interviews, a means of cross checking views and validating CAB conclusions and scores should be evidenced.

Scoring issue (d) – Decision making process ▲

Scoring issue (d) considers the importance of stakeholder access to fishery information and data, and access to information on actions taken by management to ensure stakeholders are able to provide quality input into the decision-making processes.

Accountability should be understood in the general sense of the word, essentially that management is answerable to stakeholders on management of the fisheries, and that this is demonstrated by the provision of information on the fishery to stakeholders.

The team could assess the extent to which transparency and accountability is embedded within the management system by considering the extent and means by which management provides account of, and information on, the fishery to stakeholders.

The data that are required to be available to stakeholders excludes data or information that is subject to national privacy and data protection regulation and laws associated with the fishery.

When considering the public access to information on the fisheries' performance and data, the team could include consideration of:

- The extent to which accurate and up to date data available to management is reported to the public or at least accessible on request to stakeholders.
- The resolution at which data are available and ensuring that it is appropriate to the nature and type of the fishery and of sufficient clarity to ensure meaningful engagement of stakeholders in the decision making process.

The availability of information to stakeholders on actions taken by management that have implications for sustainable use of fisheries resource could include:

- Availability of information, or at least non-confidentiality of information, on subsidies that may be considered to have implications for sustainability.
- Availability of information, or at least non-confidentiality of information, on who has access (license holders) to the resource.
- Availability of information on infractions against fishery regulation and consequent penalties and/or fines.
- Availability of information on outcomes and impact of management decision where such information is available.

At the **SG60** level, it should be expected that at least a general summary of information listed on [SA4.8.5](#) on, subsidies, allocation, compliance and fisheries management decisions) is available to (fishery, government and non-government) stakeholders on request.

At the **SG80** level, it should be expected that in addition to the information provided at the SG60 level, information listed in [SA4.8.6](#) decisions, data supporting decisions, and the reasons for decisions, are made available to all stakeholders on request.

At the **SG100** level, it should be expected that the information listed in the SG60 and SG80 levels are available openly, publicly and regularly to all stakeholders.

Scoring Issue (e) Approach to disputes ▲

Scoring issue (e) relates to the issue of approach to disputes through the presence or absence of actual legal disputes.

If a fisheries management agency is subject to court challenges, it is the record of repeated violation of the same law or regulation, the timely attempts to comply with binding judicial decisions, or acting proactively to avoid legal disputes that are important in determining the level of performance against this part of the PI.

When assessing the importance of any evidence relating to this issue, the team should consider if any violations of the same law or regulations compromise the ability of the management system to deliver sustainable fisheries in accordance with the outcomes intended by P1 and P2.

Assessment of fisheries against this issue may consider the extent to which there may be other or higher authorities to whom fishers or other stakeholders may appeal if they are dissatisfied with fishery rules or their implementation in the fishery by local managers.

If any such appeals have been made, the responsiveness or otherwise of local managers or leaders should be considered and scored.

Semi-structured interviews may be used by CABs to determine the extent to which stakeholders believe that local 'managers'/leaders respect or otherwise, any judgements or decisions made by any higher or other authority.

The interviews can also be used to determine the extent to which:

- Managers implement their own rules.
- Stakeholders believe the management system is sufficiently proactive to avoid disputes.

CABs may consider collective, participative and publically accountable involvement in management of the fishery by a broad spectrum of local stakeholders of the fishery as potential evidence of the presence of proactive avoidance of legal disputes. Supporting evidence may come from multiple and cross-checked, semi-structured interviews from a range of stakeholders representing different interests within the community.

GSA4.9 Compliance and Enforcement PI (PI 3.2.3) ▲

Background

The MSC Fisheries Standard recognises, but does not require, continued improvement in fisheries management beyond the MSC defined "best practice" standard. To meet the MSC Fisheries Standard, there must be a monitoring control and surveillance (MCS) system in place as evidence that fishers comply with the requirements of the management system and there is no evidence of systematic non-compliance (PI 3.2.3).

This requirement extends to compliance with management measures associated with MPAs and other spatial management approaches. Compliance is judged with respect to the formal requirements of an MPA's management system relating to fishing activity, including any requirements for research and impact assessment, rather than with respect to an MPA's objectives, which are unsupported by specific PIs (see [GSA3.14](#) for discussion of habitat management strategies).

Box GSA9: Marine protected areas and other spatial management approaches**Considering marine protected areas and other spatial management approaches**

Marine protected areas (MPAs) and other spatial management approaches are potentially valuable management tools. In this context, the term “MPAs” refers to the full range of MPA categories defined by the IUCN²⁴, from strict nature reserves to protected areas with sustainable use of natural resources, and “other spatial management” including requirements that are part of fishery management arrangements or plans. While there is not an explicit requirement to have MPAs or other spatial management approaches in place for fisheries to meet the MSC standard, MSC does require that the effectiveness of the management system—to which an MPA or other approach may contribute—is sufficient to achieve the sustainability of fish and other species and ecosystem impacts. It should be noted that an MPA may or may not contribute to the delivery of a sustainable fishery. (See GSA4.9 for discussion on MPAs and compliance.)

Assessing informal and traditional approaches

In all scoring issues in this PI, assessments may consider the likelihood of infractions in a particular fishery as the basis for determining the suitability of the MCS system for the fishery.

Evaluation of effectiveness of MCS in fisheries where a less formalised MCS system exists may consider the role and effectiveness of a range of factors in deterring illegal activity. These factors may include the following:

- Social disapproval;
- Prevailing norms;
- Self-monitoring;
- Presence of community fish watchers or wardens;
- Accessibility to the resource;
- Ability to smuggle catches onshore without detection;
- Mobility and homogeneity of the members of the fishery;
- Exclusivity of access and market-related factors such as value, demand or preferences (e.g., preferences regarding size).

The extent to which fishery participants are subject to fines, penalties or other repercussions, or disincentives such as public “naming and shaming”, for violating fishery customs, rules or regulations important for sustainability may also be considered. These may include fines and penalties imposed by community institutions or other local bodies.

Scoring issue (b) Sanctions ▲

At SG80 and SG100 for scoring issue (b), in some fisheries management systems, or for particular types of fisheries, it may be difficult to demonstrate an ability to enforce relevant management measures, strategies and/or rules if violations are rare. However, an absence of violations (or absence of a record of sanctions and penalties for violations) does not necessarily indicate that compliance and enforcement are effective; it could mean that MCS is in fact ineffective and what is happening is an absence of detection.

²⁴ Dudley, N. (editor), 2008. *Guidelines for applying protected area management categories*. Gland, Switzerland, IUCN.

Scoring issue (c) Compliance ▲

In scoring issue (c), at SG60, SG80 and SG100, while assessing the existence and implementation of MCS surveillance systems, efforts to inform fishers about their obligations under the fishery-specific management system may be considered, but the assessment should not be limited to this.

GSA4.10 Monitoring and Management Performance Evaluation PI (PI 3.2.4) ▲

Background

This PI focuses on whether the management system has a process of monitoring and evaluating management performance, appropriate to the cultural context, scale and intensity of the fishery, and relevant to fishery-specific management and supporting structures that are able to effect change. This PI intends to evaluate if the management system itself is reviewed, not to re-assess the efficacy of the previous PIs.

Fishery-specific management system

In both scoring issues and in each SG under this PI, relevant parts of the fishery-specific management system may include:

- A decision-making process that responds to both wider management issues of stock wide, and/or specific local stakeholder concerns;
- Data collection;
- Scientific research;
- MCS (i.e., Compliance and Enforcement PI 3.2.3);
- Collaborating in and initiating a fishery-specific or national research plan;
- Responding to feedback and response, and
- Monitoring systems as required by the Management Strategy and Information PIs in P1 and P2.

Assessing informal and traditional approaches

Assessments against this PI may consider whether there are opportunities and/or forums for decision-makers to receive feedback on the management system. It should also consider other practices such as exchange of information between the community and the management institution. The regularity of such opportunities should be considered in scoring fisheries against both scoring issues in this PI.

Where community organisations are operational, these monitoring systems can be self-determined, but do require the support of an external evaluation from a higher authority, and evidence that specific checks may be made. The external authority might include provincial or national government agency, university, NGO or donor. Activities that should be verified should ensure compliance with the following indicators: an effective organisational structure to implement decisions and corrective actions; evidence that policies are formulated, initiated and monitored, and where relevant take account of community and scientific advice, which may include consideration of supporting risk assessments undertaken by a scientific organisation or University; evidence of an effective system of custodial management and self-determined fisheries control systems.

The process of review, should however, not be explicit to a sub-management or community organisation. In the event that national or provincial government departments delegate specific duties to sub management organisations, where key parts of the management system require stock wide management, beyond community level, a review should also include the higher authorities and their performance in ensuring management against national and international measures, and that the correct tools are in place to ensure that appropriate decisions at national level and passed down to the sub management and community organisations.

GSA4.10.1 External review ▲

At SG80 and 100, “external review” means external to the fisheries management system, but not necessarily international. Depending on the scale and intensity of the fishery, it could be by:

- Another department within an agency;
- Another agency or organisation within the country;
- A government audit that is external to the fisheries management agency;
- A peer organisation nationally or internationally, and
- External expert reviewers.

End of Annex GSA Guidance

Annex GSB Modifications to the Default Tree for Enhanced Bivalve Fisheries – Guidance ▲

Foreword to Annex GSB

Annex GSB is intended to provide supplemental guidance and interpretation when applying the default assessment tree (Annexes SA, GSA) and the modifications to it (Annex SB) for assessing enhanced bivalve fisheries. The numbering of sections in this Annex corresponds to the equivalent sections in Annex SA.

This Annex contains guidance on the following:

GSB2 Principle 1	248
GSB2.1 General requirements for Principle 1	248
GSB3 Principle 2	250
GSB3.1 General requirements for Principle 2	250
GSB4 Principle 3	252
GSB4.1 General requirements for Principle 3	252

GSB2 Principle 1

GSB2.1 General requirements for Principle 1 ▲

With enhanced catch-and-grow (CAG) bivalve fisheries, management is not based on reference points or the concept of managing stock size. Shellfish are either captured as larvae on ropes or caught as seed and moved to favourable areas for grow out. Instead of removing animals from the system, survivorship is improved through the provision of substrate and better growing conditions. In the end, this process may actually contribute to increasing stock size and biomass instead of reducing it. Since bivalve culture cannot lead to exploitation rates that approach limit reference points, it is not managed as such. Scoring enhanced CAG bivalve fisheries for P1 stock status is therefore not usually appropriate. However, teams still need to determine that there is no threat to the target species, and if so confirmed there is no need to score P1 nor to have a P1 expert on the team.

Management strategies for bivalve culture are based on limiting the impact of the farming activity on the environment, with a particular focus on carrying capacity and benthic habitats. The strategies usually contain a number of elements such as number of farms per site, number of lines per farm, and locations where farming can and cannot occur (to protect certain habitat types). Information on biomass produced is gathered but not for the purpose of assessing stock status. Production surveys can provide management with useful information when used in combination with other environmental indices to give a good picture of the risk posed by the farming activity to the environment. However, they are not measures designed to maintain the wild population at high productivity levels or B_{MSY} . Therefore, scoring the harvest strategy and harvest control rules and tools PIs for shellfish farming is not appropriate.

GSB2.1.2 ▲ Translocation

Enhanced CAG bivalve fisheries involving translocations that remove seed stock from source locations should be scored against the stock status, harvest strategy/control rules and tools PIs to ensure that the exploitation of the source seed resource is properly managed. Since it is problematic to assess stock size in relation to biomass or fishing mortality, the RBF may be used.

Translocations of native species among different geographic areas may also pose risks to the genetic diversity of wild populations. This issue is most often associated with escapes from salmon net pen culture. However, the life history and genetic characteristics of bivalve populations are very different from those of salmon and other finfish. Salmon populations are highly structured by homing behaviour and adaptations to natal freshwater spawning grounds. Marine shellfish, on the other hand, have widely dispersing planktonic larvae and typically show minimal genetic divergence over broad spatial scales.²⁵ While there is a low risk for translocations of marine shellfish to affect the genetic integrity of wild populations (depending on the scale of the translocation), it is still necessary for assessment teams to examine each situation and provide rationale and evidence explaining the level of risk if it exists. This will be achieved by scoring the Genetic outcome PI.

GSB2.1.3 ▲ Hatchery

The use of hatchery propagated seed in bivalve fisheries is increasing. Although beneficial to stocks undergoing restoration or rebuilding, hatchery enhancement may also pose a risk to wild populations. Hatchery-based enhancement may reduce the genetic diversity of wild stocks, leading to reduced fitness and adaptability. This is brought about by intentional or unintentional artificial selection (“domestication” selection) in the hatchery environment. Certain practices that are used in hatcheries to maximise larval survival and growth may lead to decreased survival when seed is placed in the wild. For example, the fine-mesh screens used in shellfish hatcheries to cull small individuals from larval cultures may also select for rapid larval development. If rapid larval development in the hatchery environment were to correlate with poor post-settlement survival and growth, the reproductive success of the wild population may be compromised. This is especially true if the use of hatchery seed is widespread and overwhelms local wild stocks. Many traits could be subject to such domestication selection, and it would be difficult to develop a practical methodology by which to measure genotype-by-environment interaction for larval traits across both hatchery and natural habitats. Nevertheless, risks from hatchery enhancements on genetic diversity or adaptation are manageable with appropriate designs and monitoring.²⁶

Efforts should be made to address genetic concerns specific to the species and the geographic region where the seed will be out-planted. Best practices for managing the genetic impacts of hatchery enhancement include:

- maintaining a large number of broodstock to ensure against inbreeding and random genetic changes;
- rotating broodstock within spawning seasons and between years;
- avoiding the return of hatchery-propagated stock to the hatchery and using it as broodstock;

²⁵ Hedgecock D, S Edmonds, and P Barber. 2007. *Genetic approaches to measuring connectivity*. *Oceanography* 20:70-79.

²⁶ Hedgecock D, and K Coykendall. 2007. Genetic risks of hatchery enhancement: The good, the bad, and the unknown. In *Ecological and Genetic Implications of Aquaculture Activities*. Edited by TM Bert, pp. 85-101. Dordrecht: Springer.

- using local broodstock to limit the mixing of genetically divergent populations;
- maintaining the scale of hatchery enhancement and the reproductive potential of hatchery seed well below the size and reproductive potential of the wild population.

GSB3 Principle 2

GSB3.1 General requirements for Principle 2 ▲

All Principle 2 PISGs are applicable to enhanced hatch-and-catch (HAC) bivalve fisheries.

GSB3.1.1

There are normally no primary or secondary species captured in enhanced CAG bivalve fisheries based solely on sprat collection; therefore PIs for primary and secondary species do not need to be scored. Fisheries with some level of dredging, however, may involve the capture of primary or secondary species; for these species the primary and secondary PIs are required to be scored as per the requirements in Annex SA.

There is a potential for enhanced CAG bivalve fisheries to interact with ETP species.

GSB3.1.3.1 ▲

For suspended culture, the scoring of Principle 2 habitat PIs should clearly focus on the benthic impacts of bio-deposition and organic enrichment, and the scoring of ecosystem PIs should clearly focus on issues relating to carrying capacity and the trophic effects of bivalve filtration/feeding.

Benthic Organic Enrichment

One way in which suspended bivalve culture can impact the environment is by increasing the amount of organic material that settles on the seabed. When shellfish feed, they filter organic matter from the water column and repackage it into faster sinking particles. As this organic sediment builds up underneath bivalve farms, changes to benthic habitat and communities may occur. The extent and severity of these habitat changes is most often site specific and relate to a variety of factors including the following:

- Scale, duration, and intensity of shellfish production.
- Growing practices and methods.
- Concentration of suspended organic matter available for shellfish filtration.
- Water depth and sedimentation rate.
- Local currents and prevailing winds.

During certain situations these factors may combine to produce significant negative effects that can be seen at both the local and wider ecosystem level.

Total 'free' sulphide (S^{2-}) in surficial (0-2 cm) sediments is a cost-effective indicator of the organic enrichment effects of suspended shellfish cultivation on benthic communities. In general, there is a consistency between changes in various biological and geochemical variables and total S^{2-} in surface sediments along organic enrichment gradients. Other

metrics such as redox potential, sediment oxygen demand, sediment organic content and benthic diversity indices may also be used to assess a specific farming operations impact on the benthic environment but are less ideal due to measurement challenges, costs and/or inherent variation.²⁷

Impacts to benthic biodiversity resulting from increased S²⁻ concentrations can be significant and occur even at low S²⁻ levels. The transition from normal to hypoxic conditions has been identified as occurring at 1,500 µM S²⁻. This threshold represents a transition from “moderate” to “reduced” macrobenthic sulphide concentration and changes in the benthic macrofauna community structure. Anoxic sediments are characterised by S²⁻ concentrations >6,000 µM. A transition within the hypoxic class of sediments at 3,000 µM has been identified where less S-tolerant taxa disappear but more tolerant opportunistic species have not yet increased in abundance. S²⁻ levels above 3,000 µM represent a condition that exerts severe hypoxic stress on benthic community structure and characterise a polluted sediment condition that poses a high risk to benthic habitat.²⁸

Shellfish farming may occur where the natural benthic environment is already heavily enriched with organic matter prior to the initiation of any culture activities. In these cases, comparing measurements taken underneath farms to control sites outside of the farm can show that the culture activity is not directly responsible for the anoxic conditions.

Assessment teams could apply the sulphide methodology in justifying their scores for habitat status:

- For the **SG 60** level for habitats, assessment teams must justify that the fishery is **unlikely** to reduce habitat structure and function to a point where there would be serious or irreversible harm. This could correspond to levels of total ‘free’ sulfide in surficial sediment beneath farms of ≤ 3,000 µM.
- For the **SG 80** level for habitats, assessment teams must justify that the fishery is **highly unlikely** to reduce habitat structure and function to a point where there would be serious or irreversible harm. This could correspond to levels of total ‘free’ sulfide in surficial sediment beneath farms of ≤ 1,500 µM.
- For the **SG 100** level for habitats, assessment teams must justify that there is **evidence** that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. This could correspond to negligible levels of total ‘free’ sulfide in surficial sediment beneath farms, such as would be found at background levels for that environment.

Phytoplankton Depletion/Ecological Carrying Capacity

Bivalve aquaculture dominates the energy flow of a marine system when the phytoplankton consumed by the total production of cultured molluscs exceeds the combined reproduction rate and tidal replenishment rate of phytoplankton in the system. If phytoplankton consumption due to culture activities exceeds ecological carrying capacity, significant changes to ecological processes, species, populations, or communities in the growing environment may occur. Methods for determining the impact of suspended bivalve farming operations range from simple clearance and retention time calculations to expensive and complex computer modelling of ecological carrying capacity of affected water bodies. While it can be difficult to account for all the variables involved in coastal ecological processes, relatively simple calculations can be used to determine whether or not production is likely to be sustainable.

²⁷ Bivalve Aquaculture Dialogue. 2010. Bivalve Aquaculture Dialogue Standards. <http://www.worldwildlife.org/what/globalmarkets/aquaculture/WWFBinaryitem17872.pdf>

²⁸ Hargrave, B.T., Holmer, M., Newcombe, C.P. 2008. Towards a classification of organic enrichment in marine sediments based on biogeochemical indicators. *Mar. Poll. Bull.* 56: 810-824.

The main threat associated with the translocation of shellfish is the introduction of diseases, pests, or invasive species. There are many historically documented cases of shellfish introductions serving as vectors for disease and non-native species. In some of these cases the introductions have resulted in mass mortalities of native species and severely disrupted ecosystems. Biosecurity measures have been put in place in many areas in order to prevent such occurrences; yet regulations and enforcement may be insufficient to prevent intentional or accidental introductions. It is important that these risks are assessed through established protocol and validated through independent scientific review. For general guidance on translocation see G7.4.1.b.

The removal of seed from an area either through dredging or spat collection may have P2 impacts (e.g., habitat impacts of the dredging activity or ecosystem impacts from seed removal). For this reason CABs should consider P2 impacts for all sources of shellfish seed.

GSB4 Principle 3

GSB4.1 General requirements for Principle 3 ▲

In cases where P1 is not scored, scoring of P3 should focus only on the relevant management systems applicable to maintaining sustainable P2 outcomes.

Assessment Trees for Enhanced Bivalve Fisheries

See following Figures

Figure GSB1: Default assessment tree: Principle 1

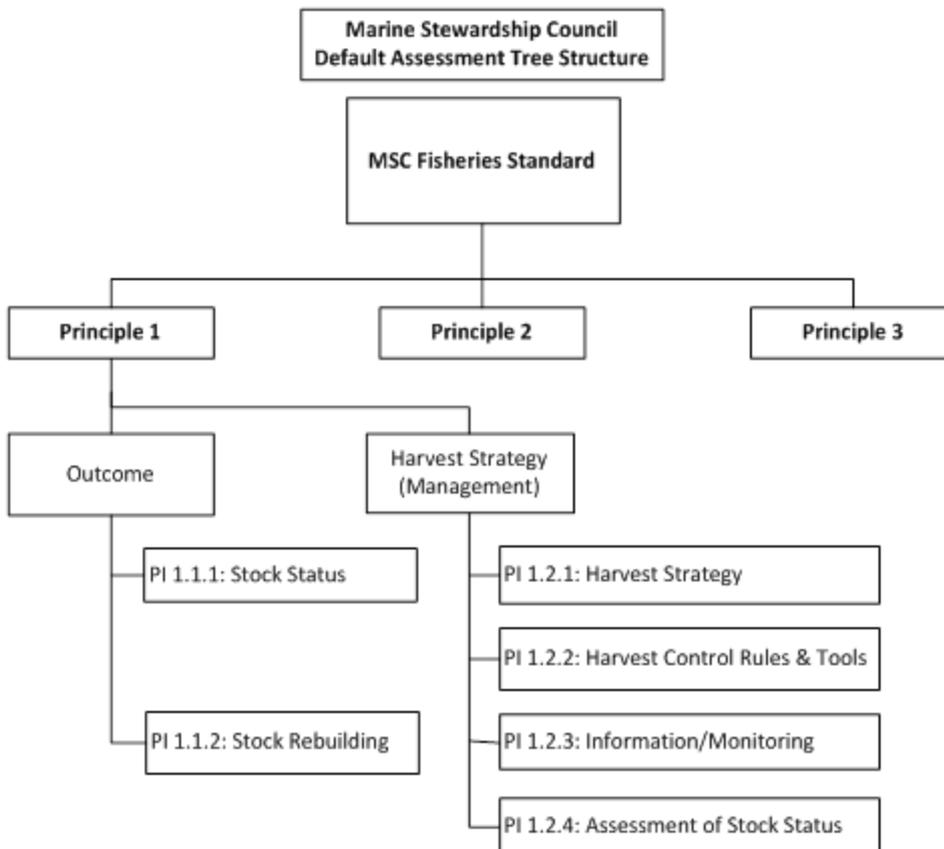


Figure GSB2: Default assessment tree: Principle 2

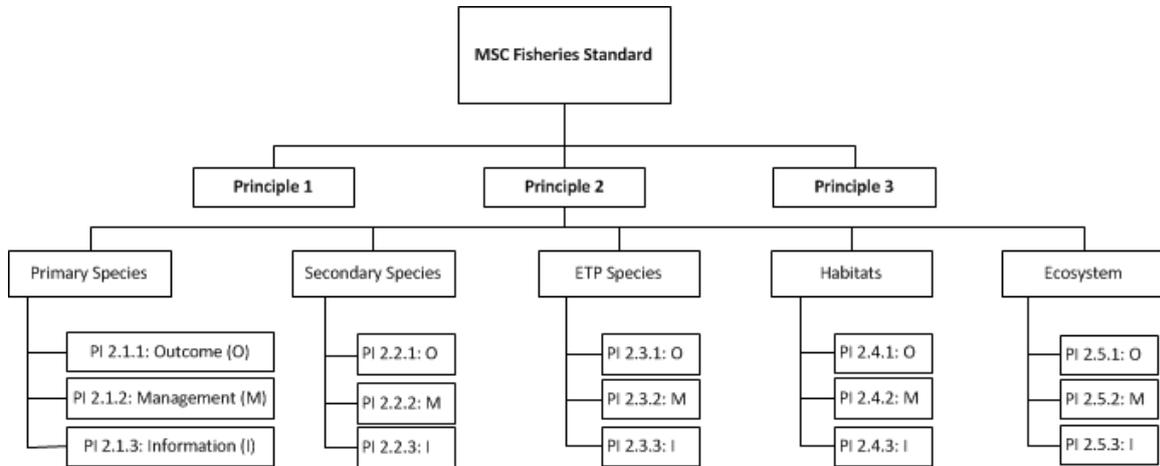


Figure GSB3: Default assessment tree: Principle 3

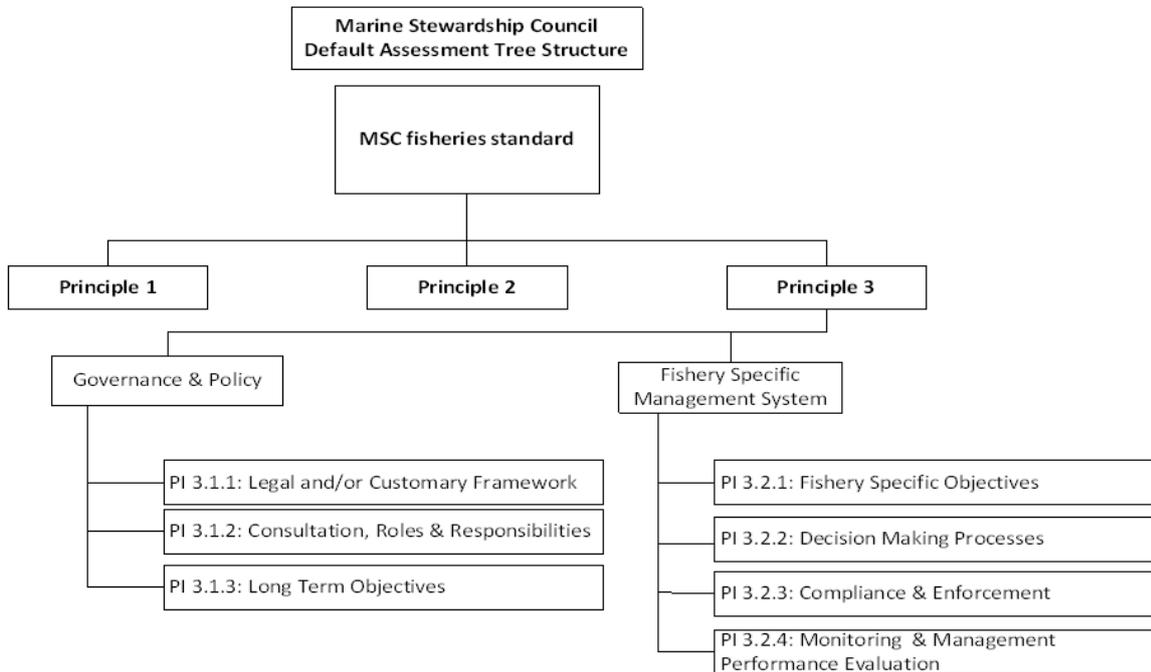


Figure GSB4: Enhanced HAC bivalve fishery Principle 1

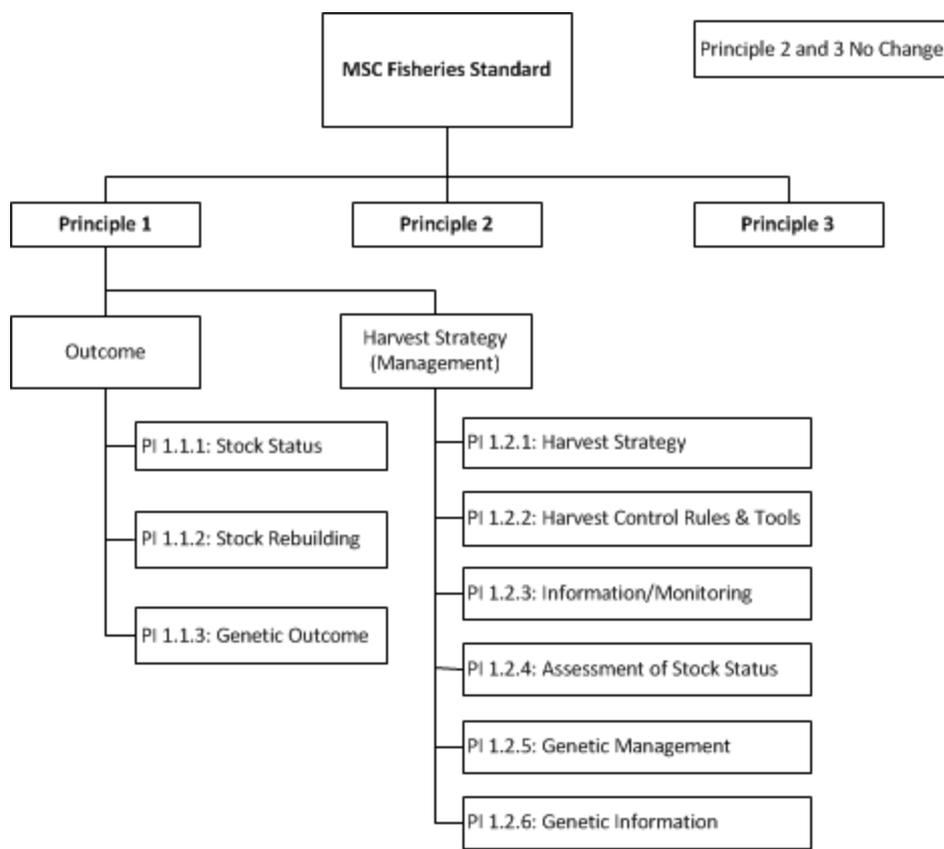


Figure GSB5: Enhanced CAG bivalve fishery based solely on spat collection without translocation: Principle 2

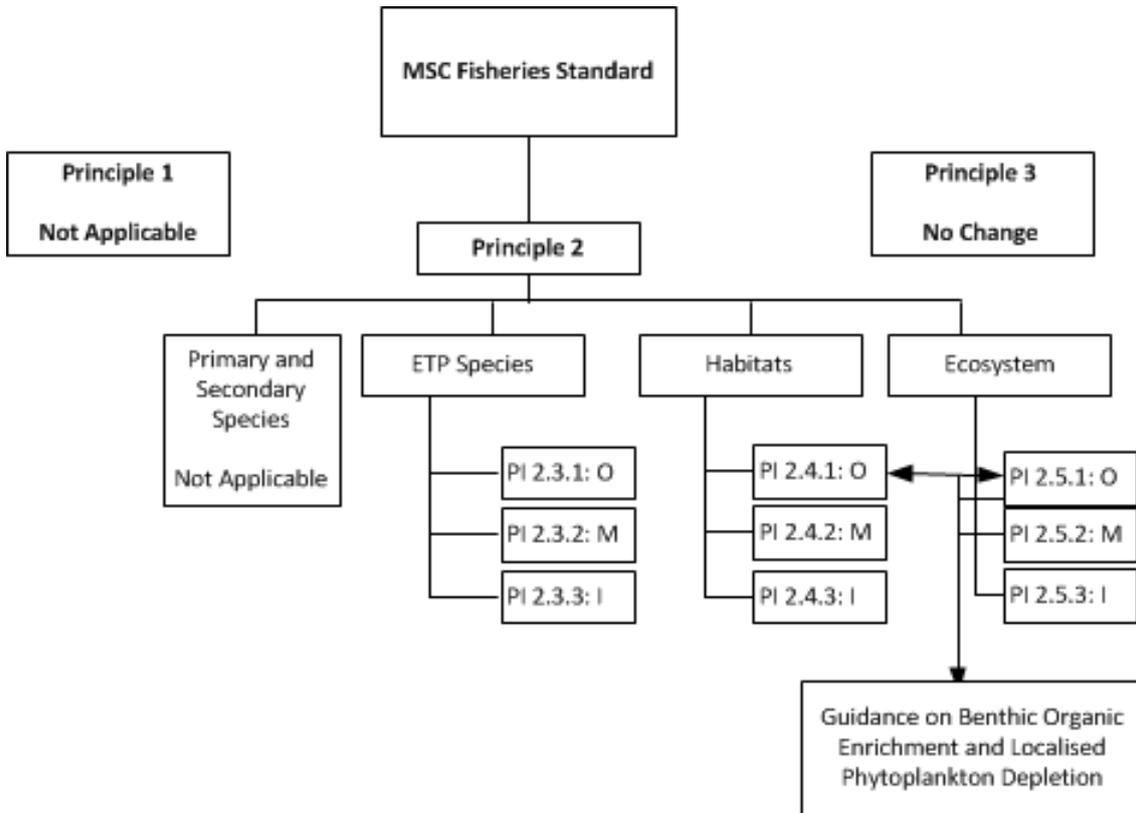
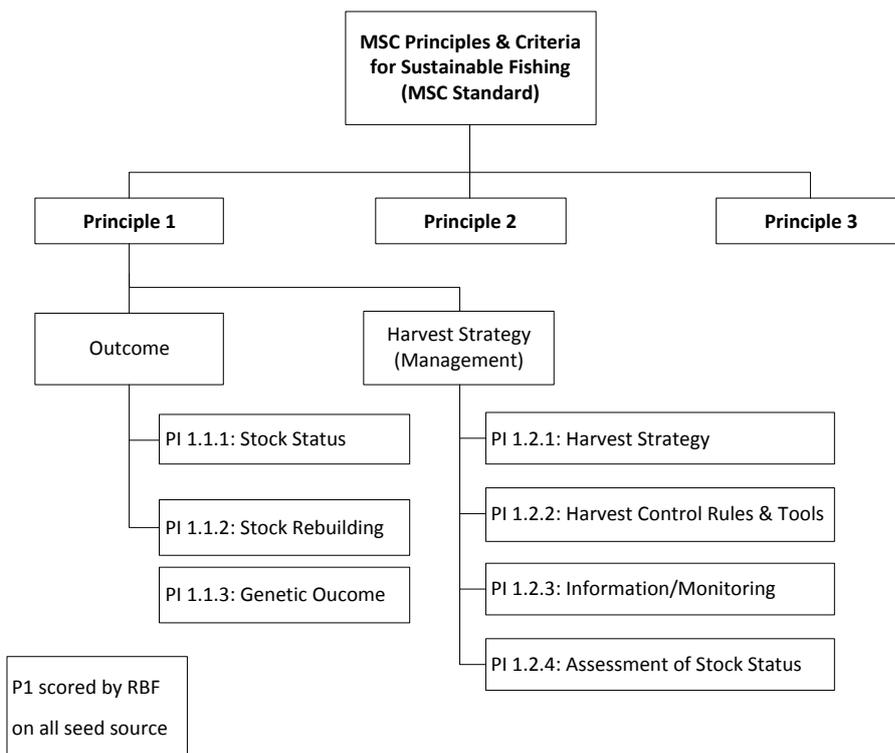


Figure GSB6: Enhanced CAG bivalve fishery based solely on spat collection with translocation: Principle 1



P1 scored by RBF on all seed source

Figure GSB7: Enhanced CAG bivalve fishery based solely on spat collection with translocation: Principle 2

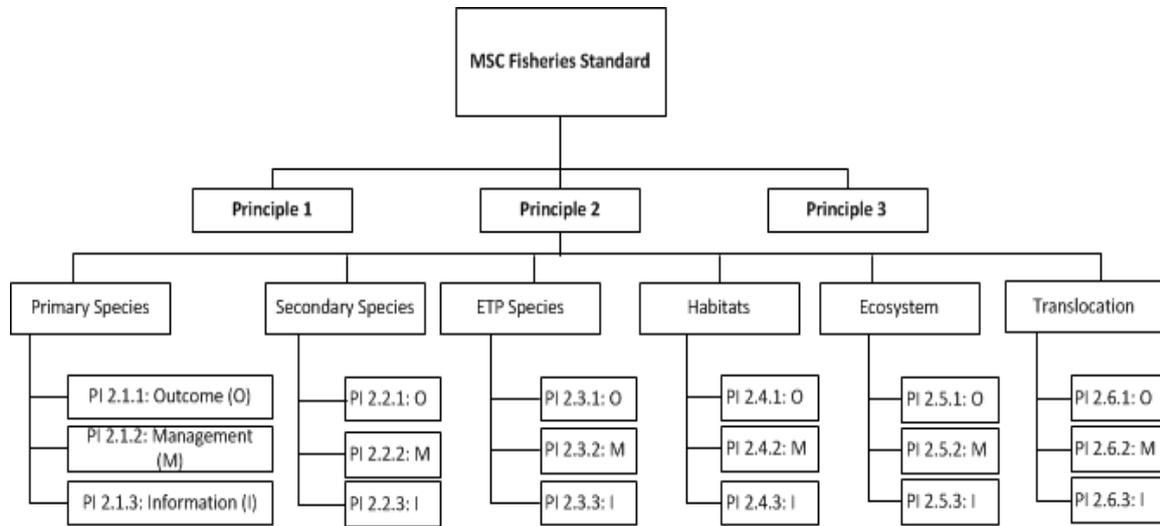


Figure GSB8: Enhanced CAG bivalve fishery with seed collection by dredging/fishing and no translocation: Principles 2 and 3

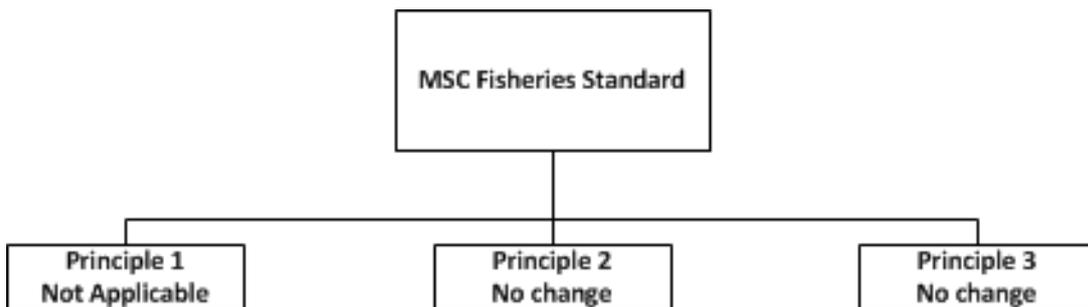


Figure GSB9: Enhanced CAG bivalve fishery with seed collection by dredging/fishing and translocation: Principle 1

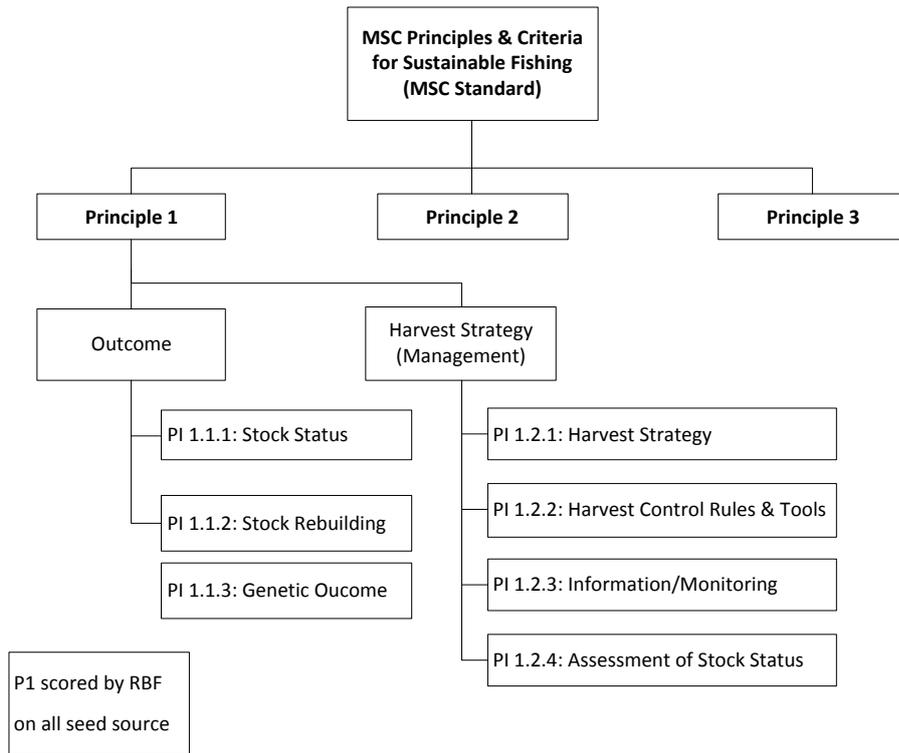


Figure GSB10: Enhanced CAG bivalve fishery with seed collection by dredging/fishing and translocation: Principle 2

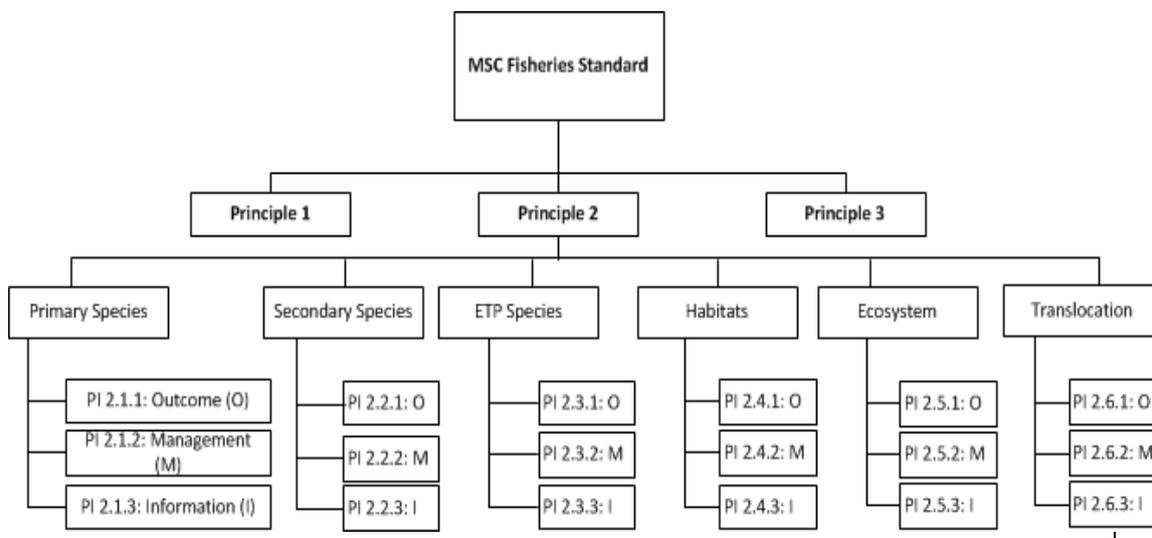


Table GSB1: Summary of scoring required for different types of enhanced bivalve fisheries

Fishery Type				Scoring Required For:					
	Enhancement Type	Spat/Seed collection	Trans-location	Principle 1	Genetic Outcome (P1)	Genetic Management & Information (P1)	Translocation PIs (P2 impacts)	Primary Species	Secondary Species
1	HAC	Hatchery produced		✓	✓	✓		✓	✓
2	CAG	On ropes/collectors							
3	CAG	On ropes/collectors	✓	✓ (RBF)	✓		✓		
4	CAG	By dredging						✓	✓
5	CAG	By dredging	✓	✓ (RBF)	✓		✓	✓	✓

End of Annex GSB Guidance

Annex GSC Modifications to the Default Assessment Tree for Salmon Fisheries –Guidance ▲

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Foreword to Annex GSC Guidance ▲

Salmon assessments differ from assessments of wholly marine species due to their complex population structure and the existence of artificial production in some places. They are complicated by the fact that any one salmon fishery may simultaneously harvest multiple populations and/or species, where each population and species can have different inherent abundances and productivities and therefore different abilities to persist in the presence of a given long-term harvest rate.

Annex GSC provides guidance and interpretation in applying the default assessment tree ([Annex SA](#)) and the modifications for salmon fisheries ([Annex SC](#)), based on the above considerations.

Assessment teams should not deviate from this guidance without justification.

For the purposes of the MSC, salmon fisheries with an enhancement component are required to conform to the scope criteria in [Table 1](#) in the Fisheries Certification Requirements. Enhancement is used to define any activity aimed at supplementing the survival and growth of one or more aquatic organisms, or at raising the total production or the production of selected elements of the salmon populations beyond a level that is sustainable by natural processes.

GSC1 General Requirements

GSC1.1.1 ▲

For the purposes of salmon assessments, the assessment team should consider Annex GSC guidance as taking precedence over [Annex GSA](#). Where no guidance is provided, [Annex GSA](#) should be used.

GSC1.1.2 ▲

All salmon fisheries, even those that are not enhanced, are scored in all PIs in [Annex SC](#).

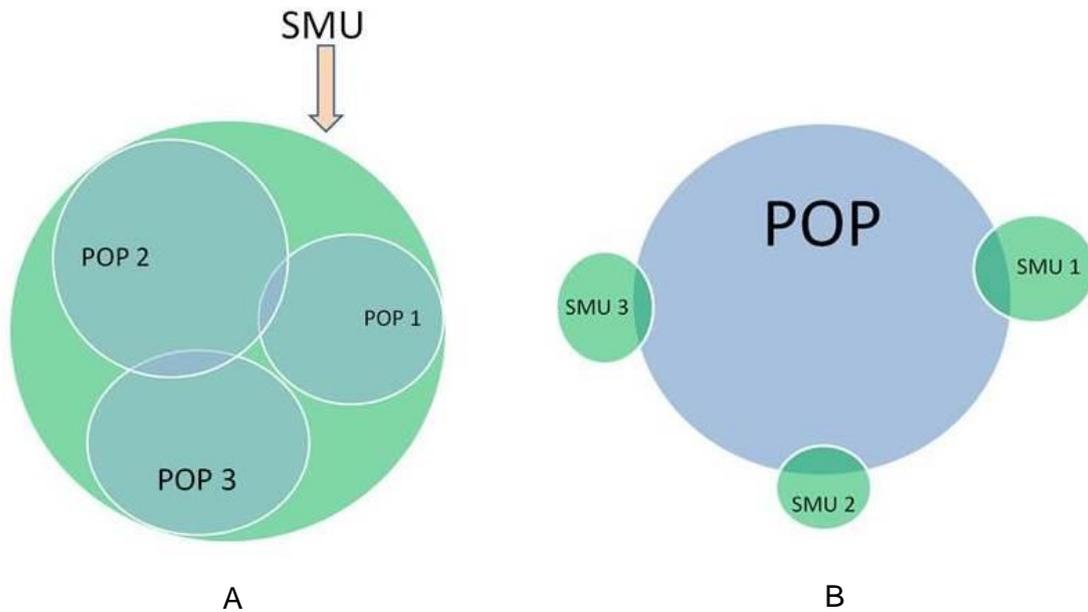
GSC1.1.3 ▲

Examples of SMUs and populations are in [Table GSC1](#).

Table GSC1: Terms and definitions

Term	Guidance to definitions in Annex SC
Population	Examples of populations, one or more of which would normally comprise a single SMU, include Conservation Units (CUs) under Canada's WSP or Evolutionarily Significant Units (ESUs) under NOAA's application of the US Endangered Species Act for salmon.
Stock Management Unit (SMU)	In practice, an SMU may be comprised of an array of wild production components, such as populations of Prince William Sound Pink salmon (Figure GSC1 A) or it may represent a collection of populations such as Early Summer, Summer, or Late Fraser River sockeye. In some situations, a population may be larger and more widely distributed than the localized management units such as terminal chum fisheries in British Columbia (Figure GSC1:B). In this situation, these component SMUs may be treated as one SMU for assessment purposes as long as the impacts of fishing on the population and the component SMUs are similar. Reference points are set for and evaluated at the SMU level, taking into account specific thresholds or other constraints that apply to one or more component populations of that SMU.

Figure GSC1: Two potential scenarios illustrating the relationship between populations and SMUs



GSC2 Principle 1

GSC2.1 General requirements for Principle 1

GSC2.1.1 ▲

The complexity of salmon population dynamics requires that within Principle 1 the sustainable management of salmon should be considered at two levels (Portley and Geiger 2014²⁹);

- **Level 1: the level of the SMU.** The objective of management should be to ensure that spawner abundance in the SMU is maintained at a level consistent with high production (for example a target such as S_{MSY} , or a proxy that reflects equal or lower risks to one or more populations).
- **Level 2: the level of the populations within an SMU.** The objective of management should be to ensure that the diversity and productivity of these populations are maintained at levels that ensure a high probability of persistence over time, and to allow that they could rebuild to high production in time in the absence of fishing.

GSC2.2 Stock status PI (PI 1.1.1) ▲

In PI 1.1.1 the status of an SMU is assessed in relation to reference points.

The definition of the SMU, establishment of its reference points, and design of its related management strategy should take into consideration the need to manage populations within the SMU to reflect the different productivities and other features of those populations, and should follow the guidance for PIs 1.2.1 to 1.2.4 as appropriate.

GSC2.2.1 ▲

Escapement based reference points generally refer to spawner abundance only in assessments of current status relative to limit and target reference points. Where other reference points are used, such as target harvest rate, fishing mortality or other proxies teams may refer to [GSA 2.2.3.1](#).

GSC2.2.2 ▲

Assessment teams are required to evaluate whether achievement of spawning goals is solely for wild (natural-origin) salmon, i.e., after excluding hatchery fish, the contribution from spawning channels, and removal of fish for hatchery brood stock.

²⁹ Portley N and Geiger HJ (2014) *Stock management units and limit reference points in salmon fisheries: Best practice review and recommendations to the MSC*. Marine Stewardship Council Science Series 2: 89 – 115.

GSC2.2.2.1 ▲

Factors that should be considered in estimating escapement of only wild fish include:

- relative abundance of artificially-produced versus wild salmon
- presence and enumeration of artificially-produced fish in the salmon fishery and on the wild spawning grounds, and
- management system's intent of how artificially-produced fish are accounted for in terms of meeting reference points.

GSC2.2.2.2 ▲

Where the management does not make a distinction between wild and artificially-produced salmon, assessment teams should reduce the score of the PI by a factor which reflects the magnitude of the uncertainty in the estimates of stock status caused by the lack of enumeration of artificially produced fish.

GSC2.2.3 ▲

In some situations scoring PI 1.1.1 for salmon fisheries is not straightforward. Where the following situations arise, the following guidance applies:

- If there are no limit reference points defined by management, as is often the case with salmon fisheries, assessment teams should refer to the guidance in [GSC2.7](#).
- In the event that 15 years of data are not available equivalent percentages should apply to the timeframe that is available.
- If the target reference point is expressed as a range, with an upper and a lower bound, the SMU should have met or exceeded the mid-point of the escapement goal range and/or the assessment team should look for evidence that directed fishing is lowered as the lower bound is approached.
- The threshold levels in [SC2.2.3.1](#) and [SC2.2.3.2](#) assume an approximately random distribution of performance over the 15 year period. Where this is not the case, and there is instead a consistent trend downwards such that most of the failures to reach the escapement goals were in the most recent years, then SG 80 is not met.
- For species or stocks that display cyclic dominance, such as pink salmon where separate stock dynamics pertain to alternate years, or Fraser sockeye where each cycle line spawns only every fourth year, each cycle line may be considered separately.

For example, pink salmon even-year and odd-year populations should be assessed separately.

- Long-term climate and ecosystem changes often affect salmon production and abundance.

Consideration of environmental variability and its impact on stock status is covered in [Annex SA2.2.7](#).

GSC2.3 Stock rebuilding PI (PI 1.1.2) ▲

The requirements for rebuilding salmon SMUs differ from those for other species in the following ways;

- The complex structure of salmon stocks requires rebuilding strategies to account for specific populations that may have lower productivities than the SMU average. One example is effective differential harvest protection through proven time and area strategies to minimize harvest impacts on low-abundance or less productive populations.
- Reduced stock status may be caused by the fishery, other human intervention such as habitat degradation, or environmental change. In the former case the rebuilding strategy is the responsibility of the fishery management agency.

If, in the latter two cases, the impact is out of the management control of the fishery (i.e., the fishery management agency) the fishery response should take into account the multipurpose nature of the use patterns in those waterways (e.g., adjust management goals either up or down to be appropriate to the new productivity of the system).

Scoring issue (c) – Use of enhancement in stock rebuilding ▲

In scoring issue (c), Use of enhancement in stock rebuilding, the team should consider the following:

- **Routine use** of artificial production to meet escapement goals as a rebuilding strategy could be described as simply using artificial production to mitigate overfishing and maintain harvest rates that are not sustainable, and therefore would generally not meet the SG60 guidepost.
- **Habitat modification** may be occasionally used to assist rebuilding.

Given that the focus of the MSC assessment is on the wild stock, there should be only limited and temporary use of such methods to rebuild wild stocks, consistent with MSC guidance on scope criteria for enhanced fisheries.

- Under exceptional circumstances, use of hatchery production as a rebuilding strategy could be targeted at a specific population within an SMU that is severely depleted and has not responded to other significant management action. In the extreme case this would include recovery hatchery programs (see [GSC2.9](#)) designed to prevent the extirpation of severely depleted populations. It is important that any population where artificial production is used as part of the rebuilding strategy is neither targeted by the fishery nor exposed to non-targeted harvesting that substantially reduces rebuilding attempts. In the case where an artificial production strategy is used, it should be considered as an interim strategy of short, finite duration in order to address immediate demographic risks to the population.

In such a case the team should assess the circumstances driving the program and verify that it has been carefully designed to contribute to the long-term viability of the depleted wild population.

Under these types of programs, addressing demographic risks often result in unintentional interactions between cultured and wild fish that will exceed any routine interaction benchmarks.

- The **rebuilding plan** should justify the need to use enhancement tools (if used), evaluate the potential risk involved, define the time bound duration for supplementation, and include monitoring and evaluation of the supplementation effort to assess the natural population response in productivity, abundance, life history and genetic diversity.

(These are in compliance with the scope criteria for “Hatch and Catch” fisheries as defined in Table 1 A.iv of the FCR).

GSC2.3.1 ▲

In the default tree, PI 1.1.2 is triggered for any score below 80 in PI 1.1.1. However, salmon fisheries may score below 80 in PI 1.1.1 for 3 reasons; due to reduced abundance, due to a failure to enumerate hatchery origin fish in spawning escapements, or a combination of both.

PI 1.1.2 is only triggered when PI 1.1.1 scores below 80 due to a reduced stock status, not if the sub 80 score is due solely to a failure to enumerate artificially-produced fish on the spawning grounds. In the latter case, a condition should be added in PI 1.3.3.

GSC2.3.2 ▲

There should be a clear expectation of component population rebuilding except under well documented exceptional circumstances; none should remain chronically depressed relative to their biologically based limits or population-specific reference points (if estimated).

Evidence to verify that no fisheries are targeting or otherwise excessively harvesting populations that are below their LRP during the rebuilding period would include the use of specific and effective management strategies to differentially avoid interception of those SMUs and depleted populations while conducting other fisheries. The rebuilding timeframes for individual populations may exceed those for the SMU.

GSC2.4 Harvest strategy PI (PI 1.2.1) ▲

The harvest strategy is an important element in management’s maintenance of the diversity and productivity of component populations.

GSC2.4.1 ▲

Activities that demonstrate fisheries managers attempt to minimise harvest on weak populations include:

- Fisheries are managed to achieve objectives at the SMU scale, but population-level units are also defined for conservation and research purposes;
- Population-specific reference points are established and stock status against those benchmarks is monitored when stock status problems are perceptible at the SMU level; and
- When faced with stock-status problems, provisions linking population status with management of SMUs are enacted. Generally population-specific reference points have not replaced SMU reference points, but harvest control rules can be adapted to account for component population status.

GSC2.4.2 ▲

Proven management strategies designed to control exploitation rates on wild stocks include differential harvest of artificially produced fish at higher rates than wild fish, and ensuring wild harvest rates are consistent with meeting SMU TRPs (escapement goals) for wild fish. This would include fish produced from spawning channels, which even if not marked, could be subject to time and area management strategies to achieve differential harvest rates.

GSC2.5 Harvest control rules and tools PI (PI 1.2.2) ▲

As a result of the stock structure of salmon, there will likely be a distribution of impacts across populations.

Teams should consider this in terms of the population's natural productivity as well as the differential harvesting from each population.

This may vary over time due to changes in both natural processes and fishery activities or management.

GSC2.5.2 ▲

In the event that it is not possible to distinguish component populations while the fishery is operating or to regulate catches of specific populations, the team should evaluate whether fishery managers attempt to utilize differential harvest and selection pressure on fish with different life-history traits (such as return timing and size/age at return) which may vary among component populations, in order to minimize impact on any one life history.

Further considerations may include:

- Demonstrated understanding that underlying component population structure exists and needs to be conserved within the SMU;
- The range in productivity levels of different component populations;
- Expected variability in environmental conditions that could differentially affect population capacity and productivity; and
- Expected variability in meeting SMU goals due to natural variation in catchability of fish, non-compliance with regulations by fishing vessels, and management error.

GSC2.6 Information and monitoring PI (PI 1.2.3) ▲

In this PI, Assessment teams should consider whether the information collected supports the Harvest Strategy at the SMU level while also maintaining individual component populations include.

GSC2.6.1 ▲

For example, 'sufficient relevant information' (SG80) might include:

- evidence that the abundance of wild component populations has been maintained at levels and spatial distributions as described from aerial and other index survey counts of spawners that show persistence of the populations.

- evidence that the management strategy has incorporated approaches that minimize fishery impacts on weak wild populations for example, time/area closures to minimize harvests of weak populations, and/or targeting and achieving the upper end of the TRP escapement range for the SMU as a means to maintain populations with lower productivity.
- explicit trade-off and risk analyses, such as that undertaken for the Skeena River Independent Science Review (Walters et al. 2008³⁰), which considers how the current definition of SMU reference points and management strategies, combined with possible variability in status and productivity of individual stock components, affects the status of individual populations.

A 'comprehensive range' (SG100) of information would include more rigorous analyses, for instance in addition to the above, stochastic simulations/risk analyses that also explicitly take into account observation error and uncertainty reflected by deviations between management targets and final end-of-season outcomes. An example of such analyses includes the harvest control rules recently developed for Fraser River, British Columbia sockeye salmon (Pestal et al. 2012³¹). The paper explored alternative harvest control rules/guidelines that can respond to decreases in productivity.

GSC2.7 Assessment of stock status PI (PI 1.2.4) ▲

The assessment of stock status includes consideration of reference points. Reference points in salmon fisheries often differ from those of wholly marine species.

While these reference points may not be expressed in terms of MSY nor PRI, the intent should be consistent with Box GSA3 in guidance for the Default Tree.

Scoring issue (b) – Assessment approach

In scoring issue (b), Assessment approach, reference points in salmon fisheries may take several forms.

Target reference points are required to be consistent with maximum sustainable yield (MSY), or a proxy that reflects equal or lower risks to one or more component populations.

For example, a Biological Escapement Goal (BEG) is defined as the escapement that provides the greatest potential for maximum sustained yield, and is generally developed using the best biological information (ADF&G³²). Another approach is S_{MSY} , or the spawner abundance at maximum sustainable yield (DFO³³). Where such quantitative reference points cannot be defined, the following guidance allows for proxies so long as they are consistent with maintaining high production.

- Target reference points may be expressed as escapement goals, target harvest rates or fishing mortality targets. The goals may take the form of Biological Escapement Goals (BEG), Management Escapement Goals (MEG), and Sustainable Escapement Goals (SEG), along with Conservation Unit Benchmarks, among others. They may be calculated using a variety of methods such as Ricker spawner recruit analysis, yield analysis, spawning habitat capacity, or sustained yield analysis. Target reference points

³⁰ <http://www.psf.ca/sisrp.pdf>

³¹ Pestal, G., A-M. Huang, A. Cass and the FRSSI Working Group. *Updated methods for assessing harvest rules for Fraser River Sockeye salmon (Oncorhynchus nerka)*. Research Document 2011/133, Pacific Region, Canadian Science Advisory Secretariat.

³² <http://www.adfg.alaska.gov/index.cfm%3Fadfg%3Dsonar.escapementgoals>

³³ <http://www.pac.dfo-mpo.gc.ca/publications/pdfs/wsp-eng.pdf>

may be single points or ranges. Any method of analysis is acceptable as long as the goal is maintaining high production or achieving a high probability of maintaining a substantial (e.g., $>B_{MSY}$) population over the long term. Examples are provided in [Table GSC2](#).

- b. Limit reference points are only sometimes explicitly defined in salmon fisheries and may take the form of minimum stock size threshold, S_{gen} , or others as defined by management (examples in [Table GSC2](#)).

Where a limit reference point is not defined a default limit reference point should be an escapement of at least 50% of the S_{MSY} escapement goal, or some other proxy of high abundance as described in (a) above (Portley and Geiger 2014³⁴).

For escapement goals expressed as **ranges**, the team should consider whether the range is quantitatively derived, and the logic by which it was established. The Assessment team should determine whether the range will maintain the population around S_{MSY} and subsequently whether the default LRP is more appropriately defined as 50% of the lower bound of the range the lower bound of the range, or 50% of the midpoint of the range.

[Table GSC2](#) shows example Target and Limit Reference Points for salmon fisheries in selected jurisdictions. This list is not all inclusive and other reference points may be used so long as they are consistent with an annual percent harvest rate that achieves maximum sustainable yield or spawner abundances at MSY (S_{MSY}).

³⁴ Portley, N and Geiger, H.J. 2014. *Limit Reference Points for Pacific Salmon Fisheries, North American Journal of Fisheries Management*. 34:2, 401-410, DOI: 10.1080/02755947.2014.882453.

Table GSC2: Example Target and Limit Reference Points for salmon fisheries in selected jurisdictions

Management Region	Existing Target Reference Points	Existing Limit Reference Points	Suggested Proxy Limit Reference Points when LRPs are not established by management
1. Alaska	<p>Three types of escapement goals expressed in numbers of fish all are potentially useable based on the data available and the method used:</p> <ul style="list-style-type: none"> • Biological Escapement Goals (BEGs) • Sustainable Escapement Goals (SEGs) • Optimal Escapement Goals (OEGs) 	<p>Minimum stock size thresholds (for stocks harvested by the Southeast Alaska troll fishery): 50% of the escapement goal's lower bound with the exception of those Chinook salmon escapement goals that have been reviewed by the Pacific Salmon Commission's Chinook Technical Committee (for these stocks. The minimum threshold amounts to 50% of the midpoint between the escapement goal upper and lower bounds).</p>	<p>50% of the escapement goal S_{MSY} point estimate</p>
2. British Columbia	<p>Various escapement goals expressed in numbers of fish and specific to particular fisheries, including:</p> <ul style="list-style-type: none"> • Management Escapement Goals (MEGs) • interim escapement goals • minimum escapement goals • escapement goals • S_{lim} (85% of the escapement that produces MSY – for Chinook) 	<ul style="list-style-type: none"> • S_{gen} (currently integrated into the harvest control rules for the Barkley Sound, B.C. fishery, foreseen in other fisheries in the future). • Total Allowable Mortality rule cutoffs (Fraser River, B.C. sockeye) • Tyee test fishery escapement cutoff (Skeena River, B.C. sockeye) 	<ul style="list-style-type: none"> • S_{gen} (if a benchmarking result is available) • 50% of the escapement goal S_{MSY} point estimate
3. Russia	<p>escapement goals (generally expressed in terms of habitat capacity, i.e., 70-100% filled habitat capacity)</p>	<p>None defined</p>	<p>35-50% filled habitat capacity</p>
4. Pacific Northwest	<p>Various escapement goals expressed in numbers of fish and specific to particular fisheries, including:</p> <ul style="list-style-type: none"> • escapement goals • upper management • thresholds 	<p>Minimum stock size thresholds (generally 50% of escapement goals, but with some exceptions described in Amendment 16 of the West Coast Salmon Management Plan).</p>	<p>50% of the escapement goal S_{MSY} point estimate</p>

Scoring issue (g) – Definition of Stock Management Units (SMUs)

In scoring issue (g), Definition of Stock Management Units (SMUs), the following issues could be considered relevant at **SG60**:

- Knowledge of physical habitat (lakes, rivers, etc.) and the wild populations that inhabit them and,
- A rationale for choosing those populations as the basis for an SMU taking into account the objective of maintaining diversity and productivity of component populations.

Additional information is expected at **SG80** such as:

- Identification and description of wild populations,
- Description of which wild populations have management goals,
- Description of which wild populations are monitored and,
- Rationale for choice of wild populations having goals and monitoring, in respect of their representativeness of the complete range of productivity and diversity amongst populations in the SMU.

GSC2.7.1 ▲

The team should assess the adequacy of SMU reference points for SMUs with higher numbers of populations, which are characterized by substantial population diversity and varying productivities, as compared to simpler and more homogeneous SMUs.

- If the SMU is composed of a single population, then the concepts of single stock management apply, and the reference points of the SMU should apply to the population.
- If the SMU is composed of multiple populations, then the establishment of reference points may be defined as an aggregate for the components. However, the aggregate reference points and management strategies for the SMU should ensure that the wild production components are maintained at a level that ensures a high probability of their persistence over time.

GSC2.7.1.1 ▲

For salmon fisheries that are influenced by artificial production, reference points should be based only on natural-origin (wild) fish. Evaluation of reference points for enhanced fisheries should consider the potential for artificially produced fish to confound evaluation. The assessment team should consider relative abundance of artificially produced versus wild salmon; both presence and abundance of artificially produced fish in the fishery and on the spawning grounds. For such fisheries reference points are expected to be based only on natural-origin (wild) fish. Evaluation of reference points for enhanced fisheries should consider the potential for artificially produced fish to confound evaluation.

The intent of management should be to maintain high production of the wild SMU and productivity of component populations to the extent to which the natural environment will allow.

GSC2.7.2 ▲

Within a watershed geographic proximity and habitat type are predictors of correlations in abundance of component population.³⁵

Therefore, indicator populations should:

- Contain representative numbers of various spawning habitat types found within the watershed and
- Be distributed geographically throughout the SMU.

In assessing coherence and correlation that team may interpret

- **'Some evidence of coherence'** at the **SG80** level to be a mean pairwise correlation of at least 0.4, and
- **'Well correlated'** at the **SG100** level to be a mean pairwise correlation of at least 0.6 or by means with similar outcome and intent.

GSC2.7.3 ▲

The assessment of this indicator includes biological factors as well as how the rationale and definition of the SMUs have informed reference points (PI 1.2.4) and management strategies (PI 1.2.1).

A well-defined SMU is one that managers can directly influence through management actions and harvest controls, which implies an understanding of how changes to harvest patterns impact escapement.

Inclusion of populations within an SMU (since the SMU is typically defined to aggregate populations for the purpose of defining a management objective for practical fishery decision making) should be based on sharing, to some extent, similar characteristics, such as

- Run timing,
- Common region of origin,
- Genetic characteristics,
- Coastal migration patterns (i.e., exposure to interception fisheries),
- Population productivities, and
- Exposure to environmental conditions that affect annual survival rates.

GSC2.7.3.1 ▲

Enhancement increases the chance of overharvesting the less-abundant and/or less-productive salmon stocks that migrate through fishing areas at the same time as the artificially-produced fish.

The team should assess whether wild and artificially influenced components are clearly distinguished in defining SMUs and when evaluating their adequacy to support establishment of reference points and management strategies.

³⁵ Stewart, I. J., Hilborn, R., and Quinn, T. P. 2003. Coherence of observed adult sockeye salmon abundance within and among spawning habitats in the Kvichak River watershed. *Alaska Fishery Research Bulletin* 10:28–41.

In the special case of side channel enhancement facilities, in order to estimate SMU status, it is important to identify the overall channel and wild stock contributions to catch and escapement. These estimates might be based on run reconstruction techniques (e.g., back calculating relative contributions of component populations at various prior times and areas based on relative spawning escapement abundances). Assessment might also include periodic evaluation of juveniles produced from the channels in relation to the number of adults spawning. In some cases, depending on the population differences within a river system, it might be possible to estimate the contribution of spawning channel fish by use of genetic stock identification techniques. The assessment team may also consider how similar the channel environmental conditions are relative to the natural environmental conditions (i.e., flow, temperature, complexity, competitors, predators, etc.).

GSC2.8 General guidance to enhancement PIs ▲

Enhancement activities are assessed against their impacts on the natural reproductive component of the associated wild salmon stock under assessment in Principle 1 (impacts of enhancement activities on other species, the same species outside of the UoA and the receiving ecosystem will be assessed under Principle 2). This mirrors the treatment of salmon in existing MSC fishery assessments and is consistent with FAO's 2010 Guidelines for Ecolabelling of Fish and Fishery products from Inland Capture Fisheries.

Table GSC3: Enhancement Terms and Definitions

Term	Definition
Habitat enhancement	May take the form of spawning channels, lake fertilization, predator removal, artificial gravel beds etc.
'Integrated' hatchery production	This is typically used for supplementation and recovery type programs.
pHOS	These fish may be strays or may be the result of returns of hatchery fish that were intended.
'Segregated' hatchery production	This type is typically used for harvest augmentation hatcheries.

GSC2.9 Enhancement outcomes PI (PI 1.3.1) ▲

This performance indicator was added to address the potential for negative effects of enhancement activities on the genetic diversity, local adaptation and reproductive capacity of the wild salmon stocks.

Potential negative impacts may include:

- Outbreeding depression due to translocation of dissimilar brood stock into locally-adapted populations;
- Inbreeding depression or loss of native genetic diversity due to directed or inadvertent hatchery selection or domestication;
- Excessive impact on wild fish for hatchery broodstock;
- Reduced natural juvenile survival due to predation, competition and other ecological interactions;

- Increased natural adult pre-spawn mortality due to handling and migration delays resulting from effects of weirs;
- Changes in spawning distribution due to weir effects resulting in reduced reproductive success;
- Increased prevalence and impacts of disease, and
- Reduction in smolts per spawner due to increased density dependent effects.

The risks (probabilities as well as magnitudes of various negative effects) of these impacts are a function of:

- Adult broodstock collection sources and their level of influence from natural populations;
- Hatchery mating, incubation and rearing practices;
- Juvenile release numbers, life stage at release, size, acclimation, and geographical distribution, and
- Straying of returning adults (hatchery fish to natural spawning grounds and natural-origin fish used for hatchery broodstock).

Scoring issue (a) Enhancement impacts ▲

In scoring issue (a), the CAB may consider the following situations;

- In systems subject to **low levels of artificial production** the comprehensiveness of the studies required for the team to judge that outcomes are likely being met can be considerably less than in cases with substantial artificial production programs. Low-level systems of artificial production will be characterised by, inter alia:
 - The proportion of hatchery releases or production of juveniles from artificial habitat compared to total artificially produced and wild production in a unit of certification is relatively small (<10%);
 - The management system has implemented measures and strategies that are known to be effective at limiting the level and spatial extent of straying, and
 - Unique wild populations are not likely to interact with hatchery fish spawning naturally.
- **Recovery hatchery programs** (artificial production programs designed for the specific conservation purpose of preventing the extirpation of severely depressed populations) are generally subject to more stringent design characteristics and performance benchmarks than other hatchery programs. The goal of a recovery hatchery is typically to increase the number of naturally spawning adults in the population. Consequently, the standard default assumptions ([Box GSC1](#) below) do not apply.

Recovery hatchery programs are implemented only after targeted commercial fishing on the population has been eliminated or severely restricted. These programs are temporary in nature and are intended to supplement depressed natural populations or provide fish for artificial recolonisation of streams that have experienced local or brood-year extinctions, to maintain genetic diversity within and among stocks, and to conserve valuable or rare genes and genotypes. They may, or may not, rely on captive broodstock to accomplish these goals. Recovery hatcheries attempt to minimize or eliminate negative effects common to fish culture, resulting in as close to wild fish as possible (primary success criteria are increased abundance of spawners and/or outmigrants, increased abundance of natural origin spawners, maintained or increased long term fitness (productivity and life history), lowered chance of extinction, recolonisation of a

self-sustaining population, and/or brood-year reconstruction, while avoiding negative hatchery impacts as much as possible).

- **Spawning channels** differ from hatchery programs but they should be scored in a similar way.

In these systems, the entire natural reproduction life cycle occurs in a natural habitat, with the main artificial production interventions being enhanced spawning gravel habitat and controlled channel flows. Once fish enter the spawning channel, all reproduction processes (e.g., mate selection, redd building, incubation and any rearing) occur without human intervention. Spawning channels differ from hatchery programs but they should be scored in a similar way.

The potential impacts of spawning channels would not be assessed according to Box GSC 1 because the consequences of straying of adult returns would typically not present the same concerns as hatcheries, as long as the channel was (a) isolated from other spawning populations that were genetically dissimilar to the population being enhanced in the spawning channel or (b) the channel exactly or very closely mimics the natural environment.

However the assessment team should consider the size of the program and similarity with populations in proximity (based on expected straying distances) in assessing the likelihood that the spawning channel operation could be having a significant impact on genetic and life history diversity of wild populations.

GSC2.9.1.1 ▲

'Relevant studies' may include, but are not limited to, studies on the same species as the UoA, studies in the same or similar geographic area, and/or studies in the same or similar habitat.

GSC2.9.1.2 ▲

Box GSC1 presents default acceptable impact guidelines for artificial production.

The guidance in **Box GSC1** establishes default criteria for evaluating whether proportions of pHOS and proportion of wild populations/ spawning areas being affected by artificial production are likely to have significant negative impacts on wild stocks. If other system specific benchmarks have been adopted by the fishery management system, the team should evaluate their appropriateness in terms of delivering similar levels of performance to those in **Box GSC1** (see below).

Box GSC1 was developed following specific best practice considerations and science developed from fitness modelling and empirical studies of yearling smolts released from the riverine species such as Chinook, coho, and steelhead hatcheries (e.g., Ford 2002, Grant 1997, Paquet et al 2011).³⁶

Specific studies on chum and pink salmon are rare but the Recovery Implementation Science Team (RIST 2009 ³⁷) concluded that hatchery strategies that involve release of fish at earlier life stages probably lead to smaller genetic changes than strategies that involve release of fish at later life stages. It may therefore be reasonable to modify pHOS criteria for pink and chum salmon because their hatchery rearing is the shortest of all species. While the magnitude of relaxation will be situation specific, assessment teams should provide rationale to support their decisions.

If additional evidence from species-specific studies is considered by the CAB to be more relevant to a specific situation a reasoned argument for adjusting the default impact guidelines should be made.

Box GSC1: Default acceptable impact guidelines for artificial production

Default acceptable impact guidelines for artificial production

The intent of this guidance is to help ensure that the majority of genetic diversity and productive capacity of the SMU is protected from the risks of enhancement activities in freshwater production areas. The guidelines in the Box are primarily derived from studies on Chinook, coho, sockeye and steelhead. Impact guidelines for pink and chum may be relaxed from these levels with sufficient justification (see above).

At the eSG60 level

- Regardless of hatchery production strategy, pHOS at the level of the population should be negligible (<1%) in greater than (>) 50% of populations, and these populations should be representative of the productivity and genetic diversity of populations within an SMU.
- pHOS at the level of the SMU should be:
 - no more than 10% for segregated hatchery programs, such that individual population pHOS values above 10% would be expected to occur only in areas in closer proximity to hatchery facilities where values might be affected by smaller wild spawning populations that are not important potential contributors to the wild diversity or productive capacity of the SMU.
 - no more than 33% for integrated hatchery programs
- The level of enhancement in the remaining populations is unspecified at SG60.

³⁶ Ford, M. J. 2002. Selection in captivity during supportive breeding may reduce fitness in the wild. *Conservation Biology* 16:815–825. [contd.]

[Refs contd] W. Stewart Grant (editor). 1997. Genetic effects of straying of non-native fish hatchery fish into natural populations: proceedings of the workshop. *U.S. Dep. Commer., NOAA Tech Memo. NMFS-NWFSC-30, 130 pp. (especially see 'Conclusions of Panel, pp. 140-157)*

Paquet, P.J., T. Flagg, A. Appleby, J. Barr, L. Blankenship, D. Campton, M. Delarm, T. Evelyn, D. Fast, J. Gislason, P. Kline, D. Maynard, L. Mobernd, G. Nandor, P. Seidel and S. Smith. 2011. Hatcheries, conservation, and sustainable fisheries—achieving multiple goals: results of the Hatchery Scientific Review Group's Columbia River basin review. *Fisheries*, 36:11, 547-561.

³⁷ RIST, 2009 http://www.nwfsc.noaa.gov/trt/trt_documents/RIST_RME_Review_2009_09_16_09_cor.pdf

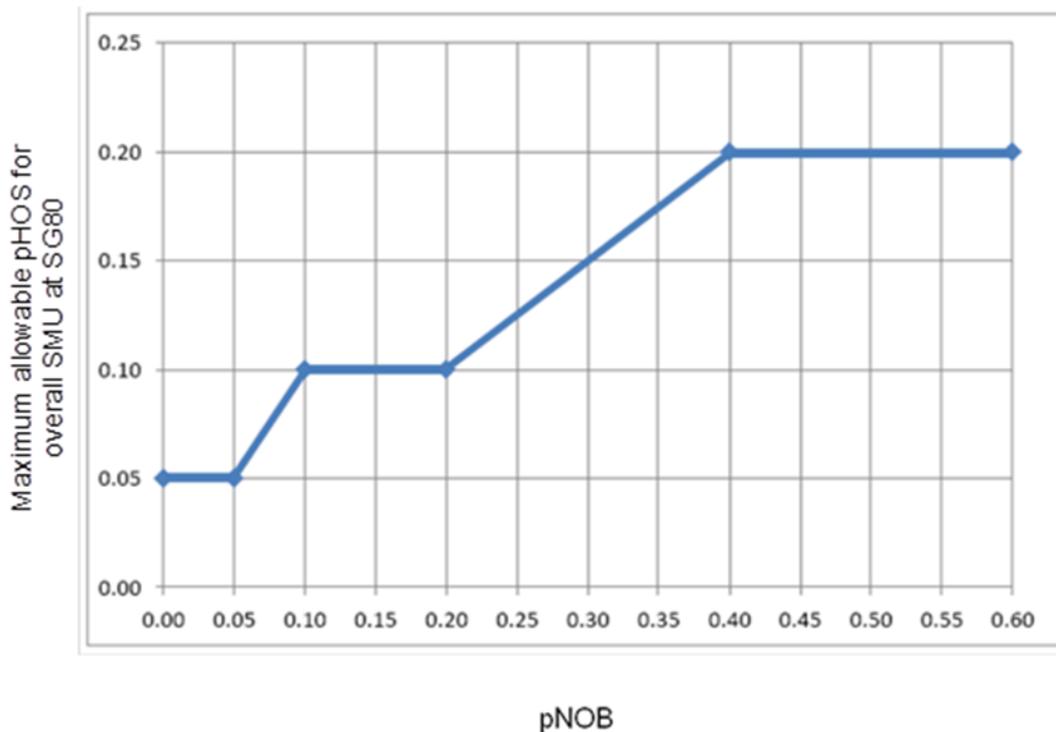
At the SG80 level

Further **pHOS at the level of the SMU** should be:

- For segregated hatchery programs:
 - no more than 5%;
- For integrated hatchery programs (These limits are presented graphically in [Figure GSC2](#)):
 - Where $pNOB < 5\%$, no more than 5%
 - equal or less than $pNOB$, where $10\% > pNOB > 5\%$
 - no more than 10% for programs where $pNOB$ is less than 20%;
 - no more than $0.5 \times pNOB$ for programs operating between 20% and 40% $pNOB$;
 - no more than 20% for programs operating at $pNOB > 40\%$.

Figure GSC2 below depicts the maximum allowable average proportion of hatchery origin fish in natural spawning populations (pHOS) within an SMU at SG80, in relation to the proportion of natural origin (wild) fish contributing to the hatchery broodstock (pNOB). These guidelines are based primarily on studies of riverine species such as Chinook, coho, and steelhead. They may be modified for pink and chum salmon, and for other species, with sufficient reasoned argument and justification.

Figure GSC2: Maximum allowable pHOS for overall SMU at SG80



At the SG100 level

pHOS should be negligible (< 1%) in all populations in an SMU.

Further Guidance in application of Box GSC1:

- pHOS at the level of the SMU is intended to reflect an estimate of the proportion of hatchery-origin fish spawning naturally in the SMU divided by the total natural spawning escapement in the SMU, which may be calculated as the simple 4-yr arithmetic mean of these estimates.
- Where there are both segregated and integrated hatchery fish spawning naturally within the SMU, the assessment team should consider the limits above in their assessment.
- Where there are hatchery-origin spawners on the spawning grounds of the SMU under assessment that originate from outside the SMU under assessment, they should be assessed at segregated criteria limits above. Strays from outside the SMU present a greater genetic risk than those originating within the SMU and are therefore only permitted at lower limits.

GSC2.9.1.3 ▲

In the event that there are no scientific studies available and no information or estimates of pHOS nor pBNOB exist the team should carefully consider the potential impact based on the magnitude of hatchery origin fish released or the percentage of hatchery fish in the harvest of the SMU.

Scoring should be precautionary, and sufficient justification provided as to why the magnitude or percentage of hatchery fish is likely to have a small impact with minimal hatchery origin fish reaching the spawning grounds (i.e., a small pHOS). Factors that might be considered include whether the hatchery type is an integrated or segregated hatchery program, whether there is differential harvesting to avoid hatchery fish on appearing on the spawning grounds, the location of the hatchery, the release site, and where the fish are eventually harvested, and whether the management agency remove hatchery fish prior to accessing the spawning grounds.

GSC2.10 Enhancement management PI (PI 1.3.2) ▲

Management is expected to address the potential for negative effects of enhancement activities on the local adaptation, genetic diversity and reproductive capacity of the wild salmon stocks.

Scoring issue (a) – Management strategy in place ▲

For scoring issue (a), 'Management strategy in place', in achieving the **SG80** outcome, the management system would reasonably be expected to design and manage its hatchery-program outcomes with an understanding of the wild population structure and characteristics that its hatchery programs could be expected to affect, as well as the development of some basic hatchery management objectives with respect to limits on impacts within this context. It could consider, inter alia,

- Identification and description of populations within the SMU;
- The level and spatial distribution of genetic and life history diversity (e.g., run timing, spawning timing, age structure, juvenile life history forms, other unique phenotypic traits);
- Populations with unique characteristics;

- The relative abundance of wild populations (magnitude, spatial distribution);
- Expected spatial distribution and magnitude of natural spawning of hatchery returns in relation to wild population abundance and diversity; and
- Objectives/intent for limiting the magnitude and spatial distribution of pHOS consistent with protecting the diversity and productive capacity of the SMU and its component wild populations.

GSC2.10.1 ▲

A likelihood of minimizing the numbers and proportions of hatchery fish interbreeding with wild fish in natural spawning areas is expected to be supported by the use and evaluation of proven artificial production and harvest management strategies. Common examples typically include:

- Siting of hatchery facilities in areas that are isolated from areas of high wild salmon abundance and diversity for the species being produced;
- Ensuring release at sites and with strategies that are likely to maximize imprinting and homing;
- Identifying high value watersheds where hatcheries are not used;
- Fishing strategies that result in differential harvest rates between hatchery and wild fish to both limit straying and ensure sustainable wild harvest rates;
- Marking hatchery fish releases so that the distribution and composition of hatchery and wild fish can be monitored in fisheries, spawning grounds and in hatchery broodstock;
- Active exclusion of marked hatchery fish from spawning in the wild through management of passage through weirs;
- Scaling hatchery release numbers to a level that is consistent with not exceeding hatchery stray benchmarks in concert with other strategies.

GSC2.11 Enhancement information PI (PI 1.3.3) ▲

This performance indicator was added to address information needed to evaluate the potential for negative effects of enhancement activities on the genetic diversity and reproductive capacity (such as density-dependent competition for spawning habitat) of the wild salmon stocks consistent with the direction identified in MSC guidance on scope criteria for enhanced fisheries (FCR 7.4.3). Guideposts address the same potentially damaging enhancement effects identified under PI 1.3.1. Specific guideposts in this indicator are based on those identified in other comparable P1 indicators regarding collection of relevant information (PI 1.2.3) and assessment adequacy (PI 1.2.4). Marking and monitoring programs will be particularly relevant to evaluations of sufficiency for this indicator.

The reason for this monitoring is to enable the management system to effectively meet wild stock escapement goals, evaluate harvest strategies to meet these goals and evaluate the interaction between hatchery and wild fish on spawning grounds. It is acknowledged that there are no such marking requirements for fish produced in artificial habitat, but important information, such as the amount of fry emigrating from these habitats are expected to be monitored annually to help gauge the potential impact on wild populations.

Scoring issue (a) – Information adequacy ▲

- At **SG60**: ‘**some relevant information**’ should be interpreted to mean that some artificially produced fish carry recognizable marks (e.g., fin clips, coded-wire tags, otolith marks, parent-based tagging (PBT) or thermal marks) such that approximate estimates can be made of contributions of hatchery salmon to harvests, hatchery broodstocks and spawning populations. It is reasonable to expect these contribution estimates are either being made or can be reasonably inferred from an understanding of the dynamics of the fishery and enhancement programs, including from an existing understanding of size, location and general release-to-adult contribution rates.
- At **SG80**: ‘**sufficient relevant qualitative and quantitative information**’ should be interpreted to mean a large representative fraction of artificially produced fish carry recognizable marks (e.g., fin clips, coded-wire tags, otolith marks, parent-based tagging (PBT) or thermal marks) to accurately estimate contributions of hatchery salmon to harvests, hatchery broodstocks, spawning populations and escapes. For large hatchery programs this may be up to 100%. A reasonable expectation is that these estimates are currently being made via data collected through associated harvest, hatchery and escapement monitoring programs at a level of precision and accuracy necessary to support the harvest management strategy. As the levels of hatchery origin spawners approach the limits stated in Box GSC1, the necessary sampling frequency increases to achieve the required accuracy of estimates of pHOS. Direct estimates are supplemented by other analytical methods.
- At **SG100**: ‘**comprehensive range of relevant quantitative information**’ should be interpreted to mean that all artificially produced fish, regardless of program size, carry marks (e.g., fin clips, coded-wire tags, otolith marks, parent-based tagging (PBT) or thermal marks) allowing highly accurate and precise estimates of hatchery salmon to harvests, hatchery broodstocks, spawning populations and escapes. A reasonable expectation is that these estimates of hatchery and wild contributions are currently made through associated harvest, hatchery and escapement monitoring programs, at a scale and intensity of temporal and spatial coverage that provides comprehensive information and understanding.

GSC2.11.1 ▲

Artificially produced fish are expected to be marked, and monitored in catch and escapement, in sufficient quantities in order to enable the fishery to define target reference points for wild salmon populations and SMUs (e.g., escapement goals), implement harvest strategies and evaluate levels of interaction between hatchery and wild fish on spawning grounds. Requirement of this information is implicit within the evaluation of stock status and reference points, which do not include artificially produced salmon.

However, the explicit scoring of enhancement information should only be scored in this PI.

GSC2.11.1.1 ▲

The marking requirements described above in the guidance on specific scoring issues do not routinely apply to fish produced from artificial spawning channels because the same monitoring and information tools generally are not available for spawning channels as compared to hatcheries. The absence of confined hatchery methods for incubation and rearing within a spawning channel limits the practical marking tools available. Nevertheless,

in situations where there is an increased likelihood of interactions between spawning channel strays and dissimilar wild populations in areas of potential interaction, there would be an expectation that the management system would assess those risks via visual marking of juveniles at emigration from the weir or perhaps via the use of genetic marking techniques. The need for such information and monitoring would be greater where the conditions of spawning channels differ greatly from the natural environment or where the magnitude of adult production originating from the spawning channel exceeds the natural production of wild populations with which the spawning channel fish might interact.

GSC3 Principle 2

GSC3.1 General requirements on Principle 2

GSC3.1.1 ▲

In Principle 2 only ETP (PI 2.3.*), Habitats (PI 2.4.*) and Ecosystem (PI 2.5.*) are modified for salmon assessments.

Primary species (PI 2.1*) and secondary species (2.2.*) should still be scored as in Annex SA. Additionally, all Annex SA requirements and Annex GSA guidance should be consulted in addition to the modifications in Annex SC and the supplemental guidance in Annex GSC.

GSC3.1.2 ▲

In Principle 2 modifications to the Default Assessment Tree in require the impact of enhancement activities on Principle 2 components is assessed.

All Performance Indicators and scoring issues should be scored even in the absence of enhancement activities.

GSC3.13 Habitats outcome PI (PI 2.4.1) ▲

Enhancement activities typically operate under a wide range of environmental regulations and monitoring requirements intended to minimize their impacts on aquatic habitat important for local biota in the ecosystems where the facilities are located. Like other land and water uses that can negatively impact fishery resources, enhancement facilities often must be authorized through a variety of environmental permits or reviews.

Scoring issue (d) – Impacts due to enhancement ▲

In scoring issue (d), Impacts due to enhancement, the team should consider the following as examples to demonstrate that hatchery facilities are **highly unlikely** to have adverse impacts at the **SG80 level**:

- Facility design, construction and operations limit effects on the riparian corridor and are consistent with fluvial geomorphology principles (for instance, avoid bank erosion or undesired channel modification).
- Water withdrawals and in-stream water diversion structures for artificial production facility operation do not prevent access to natural spawning areas, affect spawning behaviour of

natural populations, or impact juvenile rearing environment. For instance, in-stream flows between diversion and discharge return points, as well as further flow impacts downstream are not significantly diminished.

- Effluents from artificial production facilities conform with accepted or required levels that do not detrimentally affect natural populations.
- Weir/trap operations used to collect hatchery broodstock do not prevent access to natural spawning areas, do not affect spawning behaviour or success of wild fish, and do not result in significant stress, injury, or mortality in natural spawners.
- A record of compliance with applicable environmental laws designed to protect natural populations and habitats from potential adverse impacts of artificial production program operation.

GSC3.13.2 ▲

Habitat modifications due to salmon enhancement activities can include both physical changes to the river course (e.g., spawning channels), changes to water quality due to hatchery discharge, and the use of a range of man-made structures associated with the rearing habitat.

Examples of adverse impacts include:

- Delay in reaching spawning grounds that reduces spawning success;
- Blockage of access to spawning habitat from weirs used for hatchery broodstock collection;
- Dewatering of downstream water channels used for spawning and rearing;
- Increased water temperature from human activities such that fish mortality rate increases
- Improper screening of water intake systems that cause mortality or entrainment of wild fish, and
- Discharge of effluents or pollutants contrary to water quality standards.

The team should identify the types and extent of habitat modifications that are associated with enhancement activities, and determine that they are unlikely to have adverse impact.

GSC3.14 Habitats management strategy PI (PI 2.4.2) ▲

Enhancement facilities typically operate under a wide set of environmental regulations and review requirements with respect to their potential impacts on aquatic habitat, such as use of drugs, fish passage requirements, water discharge permits, and water withdrawal authorization.

The team should examine evidence to determine whether these requirements are in place and are being met as part of the overall strategy for meeting the habitat status outcome.

GSC3.14.1 ▲

The team should expect to see management strategies that seek to achieve the typical outcomes in [GSC3.13](#).

Examples of such strategies could include:

- Facility design or maintenance plans and construction permit applications that specifically consider and avoid known impacts;
- Routine (e.g., daily) inspections, maintenance and assessment activities of physical parameters such as flows, screen, and weir operations and a record of taking actions in response to these activities;
- Withdrawal permit operating requirements are being implemented, and if the system does not operate under a formal permitting system, similar operating criteria are being applied;
- Implementation of regular fish passage procedures based on explicit hatchery objectives to pass naturally spawning fish above any hatchery weir to enable sustaining natural production consistent with available habitat capacity;
- Implementation of fish handling protocol, and staff provided with associated training/guidelines, for instance, to ensure that captured adult wild fish are not injured and that upstream migration delays are minimized;
- Active implementation and maintenance of water quality management strategies to meet effluent discharge requirements;
- Annual or periodic reports that demonstrate review and mitigation actions for any such impacts.

Enhanced salmon fishery interventions may also include lake fertilization to enhance natural food production, and removal of predators or competitors to maximize early stage salmon survival.

These impacts should be evaluated in accordance with PI 2.5.1.

GSC3.15 Habitats information PI (PI 2.4.3)

GSC3.15.1 ▲

Examples of information that may be expected for enhancement activities include:

- Proportion of diversion of total stream flow between intake and outfall water;
- Withdrawals compared to applicable passage criteria and to juvenile screening criteria;
- Discharge water quality monitoring data required by or equivalent to any environmental permit provisions;
- Water flow and temperature data above the hatchery intake and below the discharge;
- Logs of periodic inspection above any hatchery weirs to ensure passage of fish upstream is not being impeded;
- Number of adult fish aggregating and/or spawning immediately below water intake point compared to number of adult fish passing water intake point;
- Records of any fish mortalities or injuries occurring of fish or other aquatic resources in the hatchery weir/traps and in the natural habitat near (or within a zone of influence) of the hatchery.

GSC3.16 Ecosystem outcome PI (PI 2.5.1) ▲

Ecological interaction risks between artificially produced salmon, non-ETP wild salmon populations and other non-ETP species are evaluated in the Ecosystem PIs. Salmon ecosystem components include effects of disease transmission, as well as intra- and inter-specific competition (including that which arises from ecosystem carrying capacity) and predation within and among salmon species in freshwater, near shore and high seas ocean waters. Generally, impacts on Principle 1 target species in the UoA are assessed in PI 1.3.1–1.3.3 and not explicitly considered in this section. Impacts on the same species outside of the UoA or impacts on other salmonid species within the UoA are considered in this section.

Scoring issue (b) – Impacts due to enhancement ▲

In scoring issue (b), Impacts due to enhancement, the team should consider the scale and size of the programs being assessed as part of creating a general risk framework alongside objective evidence for negative interactions, or lack of negative interactions.

In this context the team may consider the following factors:

- The magnitude of releases and returns of artificially produced fish in the area being assessed compared to the wild production from the same area.
 - In situations where artificially-produced fish constitute a significant proportion of either juveniles or returning adults to an area, a higher level of evidence should be required to make a judgment about likelihood.
- The likelihood that hatchery releases coincide in space and time with the presence of juvenile wild salmon.
- The level of total species production in UoA compared to historic levels while also considering potential changes in current habitat conditions and natural reproduction capacity compared to those levels.
- Indicators of any density dependent processes that could potentially be related to the enhancement program by virtue of known temporal and spatial overlap with species or stocks that are exhibiting demonstrated changes in population dynamics.

GSC3.16.1 ▲

Evaluation of ecological and ecosystem effects of enhancement activities includes the potential effects on both wild salmon and other aquatic species. Note that impacts on the wild stock(s) under assessment (UoA) are considered in PI 1.3.1.

The team should consider interactions at any life stage in both freshwater and marine habitats. Consideration should be given to the ecosystem impacts of enhancement activities across the entire geographic range of the salmon populations.

GSC3.16.2 ▲

Disease transmission and predation/competition are different issue areas that have very different levels of active management and information, monitoring and compliance requirements and capacities.

The team should assess the degree of likelihood that enhancement activities have minimal negative effect on the productive capacity of wild salmon and other aquatic populations as a result of predation and competition for resources such as prey or spawning habitat.

GSC3.17 Ecosystem management performance indicator (PI 2.5.2) ▲

Current best practice for disease management in enhancement facilities reflects a very rigorous monitoring and adaptive management system using well-established policies, guidelines, performance indicators, benchmarks and procedures designed to carefully protect hatchery and natural fish populations from the importation, dissemination, and amplification of fish pathogens and disease conditions.

The team should assess and verify the degree to which the hatchery management system is implementing an approved, proven protocol in a manner that ensures the likelihood of meeting these objectives and related outcome for PI 2.5.1.

Scoring issue (d) – Management of enhancement activities ▲

In scoring issue (d), 'Management of enhancement activities', the team should devote particular attention to management of potential impacts of the release of fish from large scale artificial production operation; in particular the strategies for avoiding adverse competition and predation effects on the receiving ecosystems including inter- and intra-species competition, both inshore and offshore, including issues of carrying capacity.

GSC3.17.1 ▲

The team should consider management of the impact of the fishery on the ecosystem as well as management of any enhancement activity on the receiving ecosystem, in particular the management of disease and competition/predation. For example, practices that minimize overlap in time and space between hatchery releases and the wild component could be implemented.

Examples:

Examples of strategies for minimizing ecological risk include³⁸

- Methods to minimize disease transmission
- Hatchery programs scaled to fit carrying capacity of the watershed or basin
- Coordination with other hatcheries to limit releases at a regional scale (i.e., the North Pacific, Columbia Basin, or major sub-basins)
- Releasing only smolts that will promptly out-migrate, unless the release of other life stages is part of a specific biological objective
- The use of acclimation ponds and volitional releases as a means to minimize residual fish and straying of returning adults
- Careful timing of releases; e.g., release of predatory hatchery fish after wild salmon reach large enough sizes to avoid being consumed
- Careful consideration of both the timing and magnitude of releases because high concentration of hatchery fish in time and space may attract predators, but may also have an offsetting effect to some unknown extent by "swamping" the predators with so many prey that the percent mortality on wild fish is also reduced
- Rigorous marking and monitoring of hatchery fish and adaptive management.

GSC3.18 Ecosystem information PI (PI 2.5.3)

GSC3.18.1 ▲

With respect to hatchery operations, relevant information to understand the impacts on the receiving ecosystem may include:

- the collection of environmental health conditions, culture and general health histories, pathogen detection collected at a relevant level of accuracy and coverage throughout the artificial production cycle consistent with requirements of implementing the disease management strategy.
- information on the distribution and size of artificially produced and wild fish at various life cycle stages in freshwater and marine areas that may be used to identify the times and areas where artificially produced fish could compete with or prey upon wild fish of the same species or with other aquatic species, with these potential interactions understood at a level of detail relevant to the scale and size of the enhancement programs.

³⁸ Kostow, K. 2009. Factors that contribute to the ecological risks of salmon and steelhead hatchery programs and some mitigating strategies. *Rev Fish Biol Fish* 19:9-31.

Kostow, K. 2012. Strategies for reducing the ecological risks of hatchery programs: Case studies from the Pacific Northwest. *Env Biol Fish* 94(1): 285-310.

GSC4 Principle 3

GSC4.1 General requirements for Principle 3

GSC4.1.1 ▲

In Principle 3 the following Performance indicators have modifications to the requirements; PI 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3 and 3.2.4. PI 3.1.1 should still be scored in accordance with Annex SA.

Further, all Annex SA requirements and Annex GSA guidance should be consulted in addition to the modifications in Annex SC and the supplemental guidance in Annex GSC.

GSC4.1.2 ▲

The team is required to assess the features of each modified indicator that have relevance to the fishery and associated enhancement activities to ensure there is an institutional and operational framework for these activities, appropriate to their size and scale, for implementing the related provisions of Principles 1 and 2 capable of delivering sustainable outcomes. This additional assessment would include examining specific relevant evidence and documenting its consideration relative to the scoring process.

The size and scale of enhancement activities (to gauge the appropriateness of the institutional and operational framework) can be simply considered by a rough comparison of the magnitude of releases and returns of artificially produced fish in the area being assessed compared to the wild production.

GSC4.4 Consultation, roles and responsibilities PI (PI 3.1.2)

GSC4.4.1 ▲

The team should assess whether the management system has effective consultation processes that are open to stakeholders related to aspects of both the fishery and the enhancement activities.

GSC4.5 Long term objectives PI (PI 3.1.3)

GSC4.5.1 ▲

It is necessary for the salmon management agency to demonstrate that its key ecological objective for its enhancement activities is managing sustainable wild salmon populations while minimizing potentially adverse effects of enhancement activities. The high level or broad management policy context with respect to the fisheries enhancement activities incorporates a **precautionary approach** which places the burden on the enhancement programs to demonstrate that they are minimizing adverse impacts identified in Principle 1 and 2 indicators, and that this burden increases as the size of the enhancement activities,

individually and cumulatively, increase. That burden of proof will also be higher for hatcheries than for other forms of artificial production that generally have lower impacts.

GSC4.7 Fishery-specific objectives PI (PI 3.2.1)

GSC4.7.1 ▲

'Clear objectives' may be interpreted to mean whether a management system, with any significant level of enhancement, has documented enhancement objectives and operational requirements related to minimizing various impacts on natural population components and ecosystem function in a clear operational plan.

GSC4.8 Decision-making processes PI (PI 3.2.2)

GSC4.8.1 ▲

In cases where enhancement programs are significant and uncertainties exist about the level of program impacts, the team should consider whether the management system is making these decisions about production, measures and strategies in a precautionary manner.

For example the team may consider decisions about increasing or decreasing release levels, whether measures are being implemented and evaluated that could be expected to reduce the scale and magnitude of potential interactions between wild and enhanced populations, and whether monitoring and evaluation programs are being initiated and/or maintained to collect essential information to inform future decisions.

It is widely recognized internationally in marine fisheries that an ideal way to increase the chance of meeting management objectives, improving future decision making, and increasing fairness is to conduct, through probabilistic simulation models/risk assessments, thorough evaluations of a wide range of management options, data collection procedures, and in some cases methods of data analysis (Walters and Martell 2004³⁹). Some such analyses, variously called Management Strategy Evaluations (Sainsbury et al. 2000⁴⁰) and closed-loop simulations (Walters 1986⁴¹), have been done for Pacific salmon (Walters 1986; Collie et al. 2012⁴²; Pestal et al. 2012). The most comprehensive examples of Management Strategy Evaluations take into account not only time dynamics of fish populations, but also dynamics of the fishery, observation error, implementation uncertainty (reflecting when regulations are followed imperfectly), and other sources of uncertainty. The outcome of such evaluations is identification of state-dependent decision-making rules that will best meet complex management objectives in the presence of these uncertainties. For a given fishery, the state-dependent rules are identified prior to the fishing and/or enhancement-activity season, and are the agreed-upon method for altering regulations based on in-season

³⁹ Walters, C.J. and S.D. Martell. 2004. Fisheries Ecology and Management. *Princeton University Press, Princeton, N.J.*, 399 pp.

⁴⁰ Sainsbury K.J., A.E. Punt, A.D.M. Smith. 2000. Design of operational management strategies for achieving fishery ecosystem objectives. *ICES Journal of Marine Science* 57: 731–741.

⁴¹ Walters, C.J. 1986. Adaptive Management of Renewable Resources. *MacMillan, New York*, 374 pp.

⁴² Collie, J.S., R.M. Peterman, and B.M. Zuehlke. 2012. A fisheries risk-assessment framework to evaluate trade-offs among management options in the presence of time-varying productivity. *Canadian Journal of Fisheries and Aquatic Sciences*. 69(2):209-223, plus supplement.

updates to the states of the system. Those rules are not subject to change in-season based on lobbying by special interest groups.

Most decisions in salmon management involve trade-offs between long-term conservation objectives and short-term fish-harvesting objectives, as well as trade-offs among user groups. Learning which decisions work best at meeting such complex objectives can be facilitated by decision makers publicly documenting the reasons for various decisions on fishing regulations and enhancement activities and comparing the expectations against outcomes.

The assessment team should consider whether such public documentation is provided in their scoring.

GSC4.9 Compliance and enforcement PI (PI 3.2.3) ▲

No modifications to Annex GSA

GSC4.10 Monitoring and management performance evaluation PI (PI 3.2.5) ▲

Scoring issue (b) – Internal and/or external review ▲

In scoring issue (b) Internal and/or external review:

- At the **SG60 level**, information should be available **internally** for hatchery program performance review.
- At the **SG80 level**, information should be available **externally and publicly** to enable external scrutiny of the hatchery performance.

GSC5 Weighting to be Applied in Enhanced Salmon Fisheries

Default weighting is applied in the MSC scoring spreadsheet, adjusted as appropriate for the additional PIs in salmon fisheries.

GSC6 Allowances for Inseparable or Practicably Inseparable (IPI) Catches in Salmon Fisheries

GSC6.1.1 ▲

Different from other wholly marine species, in salmon fisheries there may be two different types of IPI catch. These are 'non-target' and 'non-local' IPI as described below. Both types may qualify for IPI allowances so long as the stocks are not certified separately.

- a. Non-target IPI: This type of IPI will be a different species than that being assessed in Principle 1.

- b. Non-local IPI: This type of IPI is the same species as that being assessed under Principle 1, but it originates from outside of the UoA.

Example: Salmon IPI catches

In British Columbia the P1 target species is Chinook. Other species such as coho may be incidentally caught at small percentages and thus may fall under IPI allowances. Furthermore, some Chinook originating from the United States may be caught as they migrate past the fishing ground in Canada.

GSC6.1.1.1 ▲

The limitations applied under SC6.1.1.1 mean that IPI salmon stocks are only eligible for consideration as IPI if they are less than 5% by weight of the catches. These IPI stocks must meet the additional requirements of Annex SA as normal.

GSC6.1.1.2 ▲

The intention of this clause and subclauses is to demonstrate that the UoA is not hindering recovery of the IPI stocks and rationale should be consistent with [GSA3.4.6](#).

As such, “a significant portion of the total catch” may be interpreted as 30% or more of the total removal of the stock and ‘not to significantly hinder’ should be consistent with [GSA3.4.6](#).

GSC6.1.3 ▲

This amendment to the normal requirement to use the most recent year’s data reflects the multi-cohort nature of salmon species.

For pink salmon, which have a two year life history, the average catch should be calculated across the most recent years of each cycle line.

For longer-lived salmon species, average recent catches may be calculated across periods appropriate to their life history in the region of the fishery.

In cases where different salmon species are in consideration as target and IPI species, average catches should first be calculated based on data from the number of years appropriate to each species; after which the percentage catches should be determined.

End of Annex SC Guidance

Annex GSD: Introduced Species Based Fisheries (ISBF) – Guidance ▲

Background

Fisheries that are based on non-native species were previously ineligible for certification to the MSC standard.

The MSC acknowledges that there are longstanding cases of fisheries introductions wherein the introduction of the non-native species occurred prior to the existence of guidelines and regulations on introduction of exotic species into new locations and that in many instances these introductions are now irreversible and that the fisheries in their current state are subject to management measures that are designed to ensure sustainable use of the target species and associated ecosystems.

In light of this and in recognition of the increasing number of these types of fisheries seeking to be evaluated against the MSC's standard, the MSC has developed a set of scope criteria to define the conditions under which an ISBF may be considered within scope of the MSC standard and programme.

Consistent with best international practice, the intent of this policy is to enable participation in the MSC of fisheries with longstanding introductions which are irreversible and which are subject to management measures that promote sustainable use of the resources.

There are certain ecological considerations which may be pertinent to fisheries and management systems where introductions of non-native species have occurred. Such considerations may require modifications to the guidance and default tree used in their assessment. Initial guidance on aspects of the assessment that may require such modifications is provided.

Annex SD is expected to be applicable over a pilot phase period of 18-24 months after which it is expected that the scope criteria and associated assessment guidance will be subject to review and revision.

Assessment of introduced species at Principle 1 is potentially complicated because of the varying, but valid ecological objectives that can exist for fisheries that are based on introduced species. In most ISBFs, objectives are set to ensure optimum productivity of the target (introduced) species. In certain other fisheries, objectives may be set to keep populations of the introduced species at a level that ensures wider ecosystem objectives are met. These wider ecosystem objectives may include keeping the target stock at sub-MSY levels in order to allow for some level of restoration of biodiversity.

GSD2.1.1 ▲

ISBFs are required to meet the intent of Principle 1, which is to ensure that exploited populations are maintained at high abundance levels.

End of Annex SD Guidance
