

CERTIFICATION AND RATINGS

**COLLABORATION**

# 0-60 Fisheries Assessment Tool



September 2020  
MRAG Americas, Inc.



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The o-6o Fisheries Assessment Tool was developed with primary contributions by Jill H. Swasey, Susana Segurado, Jaco Barendse, Ashley Apel, Juliana Herrera, Santi Roberts, Sam Wilding, Robin Pelc, and Jackie Ireland. The work would not have been possible without the support of FisheryProgress and the Certification and Ratings Collaboration.



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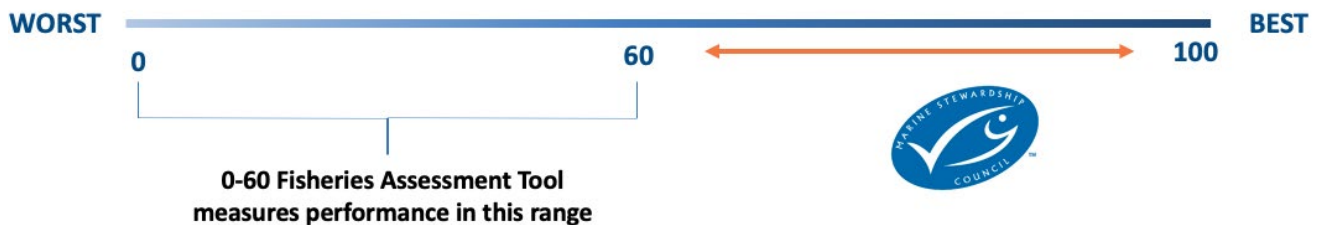
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## INTRODUCTION

The 0-60 Fisheries Assessment Tool is designed to assess fishery performance below Marine Stewardship Council (MSC) scoring guideposts (SG) of 60. It can be used by any fishery, regardless of whether they intend to seek MSC certification.

## SEAFOOD PERFORMANCE



Currently, fisheries engaged in fishery improvement projects (FIPs) evaluate progress using a number of optional tools (e.g., Rapid Assessment Tool, MSC Pre-Assessment) and develop action plans that establish their current performance against the MSC standard along with planned improvements. These tools can identify when a fishery scores below SG 60, but they do not provide more detailed guidance on where the fishery is within the 0-60 space, nor do they include SGs for charting progress through the 20 and 40 levels. Creating these guideposts enables fisheries to track and communicate their progress with greater specificity, which in turn will give seafood buyers increased ability to identify FIPs that are making the most progress or need help overcoming challenges.

The tool methodology pulls from established certification and ratings schemes (Table 1) using content that is aligned to the MSC Performance Indicators (PIs) and extends into the lower performance range, scored 0-59. This approach maintains the content pulled from other schemes and relies on guidance provided to assist with interpretation. The results from the assessment are intended to provide a relative measure of performance to help fisheries establish the distance from achieving an MSC score of 60 at select indicators.

**Table 1. Certification and Ratings schemes relied on for the development of the 0-60 Fisheries Assessment Tool Methodology.**

<b>Marine Stewardship Council (MSC)</b>	Marine Stewardship Council. 2014. MSC Fisheries Standard and Guidance v2.0 (Extracted from Annexes SA, SB, SC and SD of the Fisheries Certification Requirements v2.0). Version 2.0, 1 October 2014. Online: <a href="https://www.msc.org/documents/scheme-documents/fisheries-certification-scheme-documents/fisheries-standard-version-2.0">https://www.msc.org/documents/scheme-documents/fisheries-certification-scheme-documents/fisheries-standard-version-2.0</a>
<b>SFP Fish Source (FS and FS-E)</b>	Marine Stewardship Council. 2014. MSC Fisheries Certification Requirements and Guidance. Version 2.0, 1 October 2014. Online: <a href="https://www.msc.org/documents/scheme-documents/fisheries-certification-scheme-documents/fisheries-certification-requirements-version-2.0">https://www.msc.org/documents/scheme-documents/fisheries-certification-scheme-documents/fisheries-certification-requirements-version-2.0</a>  FishSource. 2017. FishSource Guidance for Analysts. Version 5.0, from April 2017. Online: <a href="https://docs.google.com/document/d/1Rw7_S9HxoJ_CLauTe7sol21XXMPCv2C8GxwcBOiXfh8/edit?usp=sharing">https://docs.google.com/document/d/1Rw7_S9HxoJ_CLauTe7sol21XXMPCv2C8GxwcBOiXfh8/edit?usp=sharing</a>  FishSource, 2020. FishSource Method for Evaluating Fishery Impact on the Environment; SFP Environment Risk Rating System (version 3.4). Sustainable Fisheries Partnership Foundation. <a href="https://s3.amazonaws.com/assets.fishsource.org/FS_environment_method_v3.4.pdf">https://s3.amazonaws.com/assets.fishsource.org/FS_environment_method_v3.4.pdf</a>
<b>MBA Seafood Watch (SFW)</b>	Monterey Bay Aquarium Seafood Watch. 2016. Seafood Watch Standard for Fisheries Version F3.2 (Oct. 2016-Present). Online: <a href="https://www.seafoodwatch.org/-/m/sfw/pdf/criteria/fisheries/mba_seafood%20watch_fisheries%20standard_version%20f3.2.pdf?la=en">https://www.seafoodwatch.org/-/m/sfw/pdf/criteria/fisheries/mba_seafood%20watch_fisheries%20standard_version%20f3.2.pdf?la=en</a>
*SFW will no longer conduct assessments under vF3.2 as of March 2020.	

<b>Fair Trade USA (FTUSA)</b>	FairTrade USA. 2017. Capture Fisheries Standard. Version 1.1.0. November 15, 2017. <a href="https://www.fairtradecertified.org/sites/default/files/filemanager/documents/CFS/FTUSA_STD_CFS_EN_1.1.0.pdf">https://www.fairtradecertified.org/sites/default/files/filemanager/documents/CFS/FTUSA_STD_CFS_EN_1.1.0.pdf</a>
<b>MRAG Americas, Inc.</b>	MRAG Americas, Inc. 2020. o-6o Fisheries Assessment Tool. Developed for the Certification and Ratings Collaboration. September 2020.

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## STRUCTURE OF THE TOOL

The document is organized by MSC Principle. Assessors will evaluate fisheries using indicators under the MSC's three Principles of sustainability: (1) sustainable target fish stocks; (2) environmental impact of fishing; and (3) effective management. Tables for each of these Performance Indicators form the foundation of the tool; they include content from established certification and ratings schemes that enable assessors to score a fishery against each indicator, and link to accompanying guidance necessary for interpretation. After each indicator, the tool lists information to help assessors understand what types of information and documentation to look for in support of the assessment, with key questions to help guide the research.

Criteria; the indicators against which performance is measured, have undergone considerable review and engagement and are accompanied by detailed guidance for their use.

For Principles 1 and 3, select criteria provided have been combined and/or streamlined to clarify their intent and alignment to MSC indicators at the SG 6o level. Given reliance on existing criteria from other certification and ratings schemes in the development of these criteria, there are gaps along the scoring range.

Principal 2 indicators have been aligned with the updated SFP FishSource scoring methodology. The SFP FishSource methodology scoring the environmental impacts of fisheries was revised to integrate content from the certification and ratings schemes in Table 1, harmonizing the criteria language and filling gaps where appropriate for the criteria, and the Principal 2 content now corresponds to the <6o portion of the SFP FishSource method. Remaining gaps exist where additional scoring levels were found not to be necessary, given the content does not require, or the information does not support, further levels of scoring resolution.

Table 2 provides an overview of the criteria from the certification and ratings schemes. This overview provides a quick glance at how much information you may have ready access to if the fishery under evaluation has been the subject of previous assessments.

**Table 2. Mapping of MSC Performance Indicators to existing scheme criteria. Throughout this assessment tool, these criteria are relied on to measure progress below '6o'.**

Performance Indicator	Seafood Watch	FairTrade USA	FishSource
<b>Principal 1: Sustainable Target Fish Stocks</b>			
1.1.1: Stock status			
1.1.1A: Stock status of key low trophic level stocks			
1.1.2: Stock rebuilding	<i>Indicator not measured below 6o</i>		
1.2.1: Harvest strategy			
Shark Finning			
1.2.2: Harvest control rules and tools			
1.2.3: Information/monitoring			
1.2.4: Assessment of stock status			
<b>Principle 2: Environmental Impact of Fishing</b>			

Performance Indicator	Seafood Watch	FairTrade USA	FishSource
2.1.1: Main primary species stock status / 2.2.1: Main secondary species stock status			
2.1.2: Primary species management strategy / 2.2.2: Secondary species management strategy			
2.1.3: Primary species information / 2.2.3: Secondary species information			
2.3.1: ETP species outcome status			
2.3.2: ETP species management strategy			
2.3.3: ETP species information			
2.4.1: Habitat outcome			
2.4.2: Habitat management strategy			
2.4.3: Habitat information			
2.5.1: Ecosystem outcome status			
2.5.2: Ecosystem management strategy			
2.5.3: Ecosystem information			
<b>Principle 3: Effective Management</b>			
3.1.1: Legal and/or customary framework			
3.1.2: Consultation, roles and responsibilities	<i>Indicator not measured below 60</i>		
3.1.3: Long Term Objectives	<i>Indicator not measured below 60</i>		
3.2.1: Fishery Specific Objectives			
3.2.2: Decision-making processes			
3.2.3: Compliance and Enforcement			
3.2.4: Monitoring and management performance evaluation	<i>Indicator not measured below 60</i>		
<b>Additional Criteria</b>			
IUU Fishing			
Ghost fishing and impacts from gear loss			

## ASSESSMENT SCOPE

This tool is applicable to a broad range of marine wild capture fisheries, spanning differences in information availability, but does require identification of target and non-target species for isolation in the assessment. Fisheries under assessment must define the following characteristics of the fishery:

- target stock(s),
- fishing method or gear type/s,
- vessel type/s and/or practices,
- Flag state and management authority.

The following fisheries are not eligible to assess performance under this tool<sup>1</sup>:

- Those that target amphibians, reptiles, birds or mammals;
- Those that use harmful fishing methods such as dynamite or poison; and
- This assessment tool is not applicable to salmon or bivalve enhanced fisheries.

Although this tool has been developed for use with FisheryProgress.org, it is applicable to both FIP and non-FIP fisheries. As a rapid use tool built from existing fisheries assessment standards, there are some challenges in the availability of information and assessments. For example, in assessment of stock status for data-limited species, indicators rely on a combination of productivity susceptibility analysis and population or catch trend data, although these evaluations do not provide a direct assessment of stock status. There are a number of resources available to FIP implementers that provide guidance for data-limited assessment and options for management improvements; FisheryProgress.org maintains a list of credible resources.

## USE OF INFORMATION

Existing assessments, such as a FishSource profile or a Seafood Watch report, can be used to guide fishery improvement efforts. Care should be taken however to consider the scope of the report and how this relates to the improvement work being considered; often the scope of an improvement project may differ from an existing report such that not all elements of the report may be relevant. For example, a Seafood Watch report or FishSource profile may be at the country level, where improvement may be focusing on a smaller geographic area, perhaps even at a community level. In such instances, bycatch concerns identified at the country level may differ to those at the local level. If using an existing assessment to guide improvement it is important to review the existing assessment and check that it reflects the local situation. Work plans should then be adapted to consider the local conditions, while understanding that there may be a need to consider broader issues such as fisheries management and governance at a state or national level.

When evaluating fisheries using this tool, assessors are expected to have experience, education or training in fisheries science or management to be able to critically evaluate the information available. Experience in evaluating fisheries against sustainability standards, particularly the MSC standard, is also extremely helpful. Use of this tool does not require a third-party assessor; this is not a standard and the fishery will not be formally rated against a score. Users of the tool are expected to be objective when scoring, especially if they are not completely independent of the assessed fishery. If scores are overly positive, the resulting FIP is at risk being considered non-credible. Initial evaluation under this tool should not require dedicated information collection. Subsequent assessments will provide the opportunity to refine determinations and fill gaps via the information collection process established for reporting FIP progress.

Potential sources of available information include:

**FisheryProgress.org:** MSC Pre-Assessments or Rapid Assessments that have been completed and made public may be available through Fishery Progress.

**FishSource:** A publicly available online resource about the status of fisheries, fish stocks, and aquaculture. FishSource compiles and summarizes publicly available scientific and technical information and presents it in an easily interpretable form.

**Seafood Watch Reports:** The Monterey Bay Aquarium Seafood Watch program assesses fishery environmental performance against standards based on available science.

## HOW RESULTS WILL BE USED

The assessment provides a measure of relative progress towards achieving MSC 60 across the three Principles of sustainability and does not aggregate indicator scores for Principle or overall scores. Many FIPs on FisheryProgress.org have indicators that are red or scored below 60 without further resolution in progress (Figure 1). These FIPs are often

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1. In accordance with the scopes defined by the included schemes (MSC, FTUSA, SFP and MBA SFW). This tool does not encompass Performance Indicators and assessment guidelines specific to salmon and bivalve fisheries.



dealing with very challenging environmental or political situations, and progress can be extremely slow. A common misperception is that red indicators mean that a FIP is making no improvements, and no progress is being made in that area of work. The inclusion of a scoring gradient within the lower scoring bracket is a major step forward in demonstrating progress within red indicators and will serve to acknowledge the hard work that is often ongoing in those areas. With the inclusion of 0-60 scoring, FIPs on FisheryProgress.org will now be able to better track and communicate their progress and showcase it to buyers that are interested in investing or participating in the FIP.

The new 0-60 scoring is particularly relevant to small-scale fisheries and fisheries in the developing world that may face additional challenges to reaching their sustainability goals. There has been growing recognition of the need to make the FIP model more inclusive of and sensitive to small-scale fisheries, including those that may not seek certification as an end goal or for which certification is a long way off. The 0-60 scoring will hopefully encourage more small-scale fisheries to form FIPs and report their efforts on FisheryProgress.org.

Initially, utilizing the 0-60 scoring on FisheryProgress.org will be voluntary, but we will strongly encourage FIPs to use it. In time, the scoring will likely become required.

**Figure 1. Example output for tracking improvement progress in FisheryProgress.org.**

**Improvement Progress**

FisheryProgress.org uses industry-standard indicators based on the [Marine Stewardship Council Fisheries Standard](#) to measure the performance of FIPs over time.

The table below shows a summary of the fishery's progress on making measurable improvements against the indicators. Clicking on a specific indicator will display details on the FIPs actions and progress achieved.

Key	Multi-Species/Multi-Gear/Multi-Jurisdiction FIPs
<p><b>Scoring Range</b> <span style="background-color: red; color: white; padding: 2px;">&lt; 60</span> <span style="background-color: orange; color: white; padding: 2px;">60-79</span> <span style="background-color: green; color: white; padding: 2px;">80+</span></p> <ul style="list-style-type: none"> <li><span style="background-color: gray; width: 15px; height: 15px; display: inline-block;"></span> Not addressed by this FIP</li> <li><span style="background-color: red; color: white; border-radius: 50%; padding: 2px;">🗨️</span> Click to see why an indicator is not being addressed</li> <li><span style="background-color: red; color: white; border-radius: 50%; padding: 2px;">📊</span> Click to see the 0-60 score (if available)</li> <li>⬆️ There has been progress within the 0-60 scoring level</li> <li>⬇️ There has been a setback within the 0-60 scoring level</li> </ul>	<p>Some FIPs include multiple species and/or gear types that have each been scored separately in the FIP's baseline assessment. If this FIP does include multiple species or gears, the main table displays the lowest scores for each indicator across the species/gear combinations. A summary of scores for each species/gear combination covered by the FIP will be included at the bottom of the page.</p>

### 1 - Sustainable fish stocks

Indicator	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
<a href="#">Stock status outcome (1.1.1)</a>						
<a href="#">Stock rebuilding outcome (1.1.2)</a>	🗨️	⬆️ 🗨️				
<a href="#">Harvest strategy (1.2.1)</a>	🗨️	⬆️ 🗨️				
<a href="#">Harvest control rules &amp; tools (1.2.2)</a>	🗨️	⬆️ 🗨️				
<a href="#">Harvest strategy information &amp; monitoring (1.2.3)</a>						
<a href="#">Assessment of stock status (1.2.4)</a>	🗨️	🗨️				

### 2 - Minimizing environmental impact

Indicator	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
<a href="#">Primary species outcome (2.1.1)</a>						
<a href="#">Primary species management (2.1.2)</a>						
<a href="#">Primary species information (2.1.3)</a>						
<a href="#">Secondary species outcome (2.2.1)</a>						
<a href="#">Secondary species management (2.2.2)</a>						

## HOW TO USE THIS GUIDE

In each of the following sections we provide tables for each MSC Performance Indicator (PI) where there is existing standard content, at the scoring guidepost 60. Below that row we identify content from other schemes at the various scoring levels across <20, 20, and 40; where a single criterion falls below 60, it is represented as <60 scoring level without additional resolution. Where content is absent at a given scoring level, the row for that level is absent.

The tables provide reference to the source certification or rating standard to allow users to refer to those standards where helpful. Terms with clarifying definitions provided in ‘Appendix A: Additional Guidance’ are in blue text, with numbers in the bottom row of each table indicating the corresponding guidance element.

There are select PIs that measure more sophisticated aspects of management and therefore may not be relevant to lower performing fisheries (that would be using this tool). Additionally, the different designs of the various schemes may result in an indicator from one scheme encompassing multiple scoring issues under a MSC PI. In order to mitigate the risk of double counting that could occur from repetitive content and to simplify measuring performance and applying existing information, in some cases an MSC PI scoring issues (e.g. a, b) are grouped for measurement rather than evaluated separately (though all are represented, unless indicated otherwise). For example, in evaluation of the harvest management strategy in MSC PI 1.2.1, three individual scoring issues evaluate design, evaluation and monitoring of the harvest strategy; however, criteria aligned from other schemes consider the presence, design and effectiveness of the harvest strategy collectively. Additionally, across PIs, measurements below 60 may only contain a single level (indicated as <60) or several stepped criteria (<20, 20 and 40). The degree of resolution provided for FIP evaluation should be able to identify if there are serious sub-60 issues in any MSC indicator, to encourage FIPs to ultimately work on all key issues related to sustainability.

Across PIs, where multiple criteria exist at a scoring level, the criteria may complement each other, or they may be duplicative. Where this occurs, the assessor has the option to choose between the criteria (as designated by the inclusion of the word ‘OR’), or needs to meet both criteria to achieve the scoring level (as designated by the inclusion of the word ‘AND’).

During the assessment, if the fishery is known to perform at 60 or above on any scoring issues (as determined through MSC pre-assessment or the information provided in this guidance document), do not score against those indicators. Where information is unavailable for evaluating against a given criterion, the fishery should be scored NA/can’t evaluate.

## SCORING

The range of performance of wild capture fisheries extends across a scoring range that encompasses poor to well performing fisheries as determined by existing scheme criteria. The MSC Fisheries Standard only covers the 60-100 portion of the range, including criteria that represent minimum acceptable limits to near perfect. Scoring in the 60 -100 range varies under MSC pre-assessment and full assessment. This is helpful to understand in the context of assessing progress below 60. An MSC pre-assessment does not attempt to duplicate a full assessment against the MSC Fisheries Standard<sup>2</sup>. The pre-assessment relies on Draft Scoring Ranges for scoring PIs; which indicate the likely scoring range expected in full assessment. Assigning these Draft Scoring Ranges is simpler than the full scoring process, but does still require consideration of individual scoring issues. Table 3 summarizes the scoring relationships between pre-assessments, full assessments and the equivalent scores in the [MSC Benchmarking and Tracking Tool](#) (which benchmarks fisheries against the MSC Fisheries Standard at a particular point in time and tracks progress for the duration of the period that the fishery is in a FIP).

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2. A full assessment involves a group of assessment team members and public consultation stages that are not included in a pre-assessment. A pre-assessment provides a provisional assessment based on a limited set of information provided by the client.

**Table 3. Scoring relationships between MSC pre-assessments, full assessments and the equivalent scores in the MSC Benchmarking and Tracking Tool.**

Draft Scoring Range in Pre-Assessment	Description	Scoring Guidepost (SG) in full assessment	Description
≥80 (BMT = 1)	Information suggests fishery is likely to exceed SG80 resulting in an unconditional pass for this PI. The fishery may meet one or more scoring issues at SG100 level	100	State of the Art
		80	Best Practice
60-79 (BMT = 0.5)	Information suggests fishery will reach SG60 but may not meet all scoring issues at SG80, a condition may be needed for this PI	60	Minimum Requirements
<60 (BMT = 0)	Information suggests fishery is not likely to meet the SG60 for any scoring issue and therefore would fail on this PI	<60	Fail

The three schemes employed in this assessment tool (SFW, FTUSA and FS) contain criteria that map across the full spectrum of performance from 0, representing very poor or absent management and information, intermittently through 100.

For Principles 1 and 3, criteria from the three schemes, along with the MSC, collectively map across the performance range extending from 0-100 and served as the basis for the scoring levels applied in this methodology, from which we developed general descriptions of management, outcomes and information that could be expected at the various scoring levels. Where existing criteria aligned, scoring is approximate to represent the levels below 60.

For Principle 2, criteria have been aligned with the updated SFP FishSource environmental impacts scoring methodology.

We represent the levels as steps in progress where <20 is the lowest level followed by 20 and 40, until criteria at SG 60 can be assessed and achieved or as a single step represented as <60.

The scoring levels below 60, and the MSC equivalent, are provided in Table 4 and Table 5 to further assist in evaluation.

**Table 4. Scoring range representing performance below 60 and general definition of performance at those tiers.**

	<20	20	40
Management Strategy and System Performance	No management system or strategy exist; there is no control over the fishery either exercised or planned. Fishery is completely open access with no framework within which to develop management, nor political desire to do so.	Management is very poor, and/or critically flawed, either due to a lack of resources, or lack of political will.	Some key aspects of management remain insufficient or ineffective, likely due to a lack of resources, but not a lack of political will or basic management framework. Evidence that no local, national, international laws are being broken.
Information Availability and Outcome Performance	No information on stock status, nor indication of productivity or susceptibility from basic biological characteristics; no existing scientific or commercial data and no proposed program to collect data.	Poor information is available on the fishery’s impacts target stocks, non-target species, endangered, threatened, or protected (ETP) species, habitats and ecosystems. The limited information can only allow for a rudimentary assessment of likely productivity and susceptibility. No basis on which to develop reference points. Available Information suggests high susceptibility; high overfishing or stock depletion assumed.	Generic reference points available but suggest target and/or non-target stocks are overfished (below limit reference point), and/or overfishing is occurring. For data limited stocks, PSA can be performed, but shows low productivity/high susceptibility. Information suggests that the fishery is negatively impacting non-target and/or ETP species or fishing mortality is unknown. Fishing activities cause some impact to habitat and ecosystem, though not clearly quantified or mitigated.

**Table 5. Upper scoring range, representing performance at and above 60 and general definition of performance at those tiers.**

	Equivalent to MSC 60	Equivalent to MSC 80	Equivalent to MSC 100
Management Strategy and System Performance	Some important aspects may be lacking, but none of them sufficient to prevent a certification or passing rating by themselves. Monitoring and enforcement is in place and believed effective.	Management measures in place are expected to be effective, and precaution is accounted for.	Best practices in management ensures the fishery is sustainable with a high degree of certainty.
Information Availability and Outcome Performance	Generic reference points available and show biomass is likely above PRI; fishing mortality is fluctuating around $F_{MSY}$ or $B_{MSY}$ (as relevant). Information available to estimate fishing mortality and effects on non-target and ETP species. Fishery is unlikely to hinder ETP recovery. Habitat and ecosystem impacts possible, though unlikely that the fishery causes serious or irreversible harm.	Stock-specific reference points available and show biomass is highly likely above PRI and/or MSY related targets (as relevant). Information available to assess fishing mortality and effects on non-target and endangered, threatened, or protected species. Fishery is highly unlikely to hinder ETP recovery. Strong evidence that the fishery is not causing serious harm to habitats or ecosystems.	Stock specific reference points available and show biomass is above PRI and/or MSY related target (as relevant) with a high degree of certainty. Information available to ensure non-target and/or ETP species not impacted by fishery. Strong evidence or scientific consensus that fishery is not causing harm to habitats or ecosystems.

## PRINCIPLE 1: SUSTAINABLE TARGET FISH STOCKS

Criteria under Principle 1<sup>3</sup> assess the target stock(s) of the fishery (those stocks being exploited by the fishery). Indicators under 1.1 address the outcomes of status and rebuilding of target fishery stocks, and 1.2 addresses the management of the stock (harvest control rules and tool, harvest strategy) and information in support of the management strategy and assessment of stocks. If the fishery under assessment is a multi-species fishery, only exploited stocks should be evaluated under Principle 1, other species should be evaluated under Principle 2. Each known key target stock included in the fishery should be assessed separately. Special consideration is given where the target stock(s) are low trophic level species. The scoring of key target stocks examines the impact of the fishery on the target stocks and whether those stocks are at sustainable levels.

Performance Indicator 1.1.2 (stock rebuilding timeline) is not included within the assessment tool, this indicator measures aspects of performance that are not critical for stepwise progress below 60.

PI 1.1.1: Stock Status	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.
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MSC Scoring Issue	SG 60
(a) Stock status relative to recruitment impairment.	It is likely (P>70%) that the stock is above the <b>point where recruitment would be impaired (PRI)</b> .
When biomass is not available	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).
(Clause SA2.2.4)	
In the absence of analytically determined $B_{MSY}$ or PRI (guidance GSA2.2.3.1)	Default reference points may be appropriate for measuring stock status depending on the species: $B_{MSY}=40\%B_0$ ; $PRI=20\%B_0=1/2B_{MSY}$

Evaluate biomass in relation to limit and target reference points, where available.

	<20	20	40
Criteria to be met			
Current biomass ( $B_{CURRENT}$ )	$B_{CURRENT}$ is < 1/3 of biomass limit reference point ( $B_{LIM}$ )	$B_{CURRENT}$ is between 1/3 and <2/3 of $B_{LIM}$	$B_{CURRENT}$ is between 2/3 and <1 of $B_{LIM}$
Biomass limit reference point ( $B_{LIM}$ )	OR No $B_{LIM}$ is defined and $B_{CURRENT}$ is < 1/6 of $B_{TARGET}$	OR No $B_{LIM}$ is defined and $B_{CURRENT}$ is between 1/6 and <1/3 of $B_{TARGET}$	OR No $B_{LIM}$ is defined and $B_{CURRENT}$ is between 1/3 and <1/2 of $B_{TARGET}$
Scheme Reference	FS: 4 quantitative (a, b), 0-1.9	FS: 4 quantitative (a, b), 2-3.9	FS: 4 quantitative (a, b), 4-5.9
Additional Guidance	1	1	1

3. According to MSC Fisheries Standard v.2.0, “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.”

In the absence of biomass estimates and reference points use fishing mortality estimates in relation to target and MSY-based reference points, where available.

	<20	20	40
Criteria to be met	Current fishing mortality rate ( $F_{CURRENT}$ ) is >2.5 of target fishing mortality rate ( $F_{TARGET}$ ), fishing mortality at maximum sustainable yield ( $F_{MSY}$ ) or similar	Probable (>50% chance) or suspected that fishing mortality from all sources (including commercial, recreational, subsistence, and ghost fishing, if applicable) is above a sustainable level that is appropriate given the species' ecological role.  <i>OR</i> $F_{CURRENT}$ is between >2 and 2.5 of $F_{TARGET}$ , $F_{MSY}$ or similar	$F_{CURRENT}$ is between >1.5 and 2 of $F_{TARGET}$ , $F_{MSY}$ or similar
Scheme Reference	FS: 5 quantitative 0-1.9	SFW: 1.2, High (1)/  FS: 5 quantitative 2-3.9	FS: 5 quantitative 4-5.9
Additional Guidance	2a	2a,b	2c

In the absence of reference points and assessments, qualitative information or data-limited approaches generally identify status of the stock.

	<20	20	40
Criteria to be met	Determined to be a <b>stock of concern, vulnerable, endangered or threatened</b> by a state, national, or international scientific body.	Probable that stock is <b>depleted/overfished</b> .  <i>OR</i> The stock is recognizably in a poor (i.e., severely overfished, unhealthy, depleted) condition.	Probable that stock is below the <b>limit reference point</b> .  <i>OR</i> Biomass is unknown and the species is <b>highly vulnerable</b> .
Scheme Reference	SFW: 1.1, High (1)	SFW: 1.1, High (1) /  FS: 4 quantitative (b), <6	SFW: 1.1, High (1) /  SFW: 1.1, High (3a)
Additional Guidance	3a	3b,c	3b

**What to look for**

FS evaluation criteria measure the scale of biomass in relation to reference points. This does differ from the MSC PI, where criteria evaluate the probability that biomass is above the point where **recruitment would be impaired (PRI)**. Estimates of biomass in relation to reference points are needed, along with understanding the certainty of the data used in this determination. Refer to results of the most recent stock assessment, or descriptions of stock status from credible information sources that have consulted assessment reports.

In the absence of a recent stock assessment or appropriate reference points, qualitative information and data-limited approaches should be applied.

Key Questions	<ul style="list-style-type: none"> <li>➤ Is there an up-to-date stock assessment or reliable estimate of biomass available?</li> <li>➤ Does the stock assessment provide an indication of biomass relative to biological limited reference points?</li> <li>➤ Are proxy indicators available to provide estimates of stock status?</li> <li>➤ Do proxy indicators estimate that the target stock is improving or declining?</li> </ul>
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PI 1.1.1A: Stock Status (LTL stocks)	The stock is at a level which has a low probability of serious ecosystem impacts.
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MSC Scoring Issue	SG 60
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(a) Stock status relative to ecosystem impairment.	It is likely that the stock is above the point where serious ecosystem impacts could occur.
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Evaluate status of key low trophic level stocks, considering the trophic position of the target stocks to ensure precaution in relation to their ecological role.

Criteria to be met	<60
Scheme Reference	For <b>forage species</b> , appropriate reference points have not been defined.
Additional Guidance	4

What to look for	<p>Identify whether the target species fit the definition of low trophic level species, this may consider qualitative information on the species role in the ecosystem.</p> <p><u>Species types that are defined by default as “key LTL stocks” (Box SA1, MSC Standard):</u></p> <p>See ASFIS List of Species for species included in different families and orders (<a href="http://www.fao.org/fishery/collection/asfis/en">http://www.fao.org/fishery/collection/asfis/en</a>)</p> <ul style="list-style-type: none"> <li>➤ Family Ammodytidae (sandeels, sandlances)</li> <li>➤ Family Clupeidae (herrings, menhaden, pilchards, sardines, sardinellas, sprats)</li> <li>➤ Family Engraulidae (anchovies)</li> <li>➤ Family Euphausiidae (krill)</li> <li>➤ Family Myctophidae (lanternfish)</li> <li>➤ Family Osmeridae (smelts, capelin)</li> <li>➤ Genus Scomber (mackerels)</li> <li>➤ Order Atheriniformes (silversides, sand smelts)</li> <li>➤ Species Trisopterus esmarkii (Norway pout)</li> </ul>
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Key Questions	<ul style="list-style-type: none"> <li>➤ Is the species defined as a Low Trophic Level species?</li> <li>➤ Is there an up-to-date stock assessment or reliable estimate of biomass available?</li> <li>➤ Does the stock assessment estimate reliable reference points?</li> </ul>
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PI 1.1.2: Stock Rebuilding Timeline	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe. <i>This indicator is not evaluated in this assessment tool.</i>
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PI 1.2.1: Harvest Strategy (management)	There is a robust and precautionary harvest strategy in place.
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MSC Scoring Issue	SG 60
(a) Harvest strategy design	The harvest strategy is expected to achieve stock management objectives (as reflected by stock highly likely to be above PRI, and at or fluctuating around level consistent with MSY).
(b) Harvest strategy evaluation	The harvest strategy is likely to work based on prior experience or plausible argument.
(c) Harvest strategy monitoring	Monitoring is in place that is expected to determine whether the harvest strategy is working.

Evaluate whether there is a robust and precautionary harvest strategy in place and is effective at maintaining the target stocks above depleted levels, ineffective or absent entirely.

	<20	20	40
Criteria to be met	There is no management where clearly needed.	The fishery targets/ retains overfished, depleted, endangered or threatened species, is a substantial contributor to mortality of the species, management lacks strategy to rebuild species or limit mortality and/or effective practices designed to limit mortality of these species.	Management effectiveness is unknown and it is <b>LIKELY</b> that the fishery is having serious negative impacts on retained populations.  <i>OR</i>  No management and <b>UNLIKELY</b> that the fishery is having serious, negative impacts on any retained populations.
Scheme Reference	SFW: 3.1, Critical (2)	SFW: 3.1, Critical (3)	SFW: 3.1, Ineffective (1) / SFW: 3.1, Ineffective (2)
Additional Guidance	5a	5b	5c

What to look for:	<ul style="list-style-type: none"> <li>&gt; A harvest strategy would be provided in a management plan and provide guidance in response to decreases in stock status.</li> <li>&gt; Evaluating against these criteria will require understanding that there is a management plan and accompanying harvest strategy, whether that plan and strategy are evaluated, and what information is collected to determine whether the harvest strategy is effective at maintaining stock levels.</li> <li>&gt; Note: Only evaluate those species that are targeted by the fishery and are known or suspected to be overfished, depleted, endangered, threatened species. Management of retention or bycatch of non-target species is covered under P2.</li> </ul>
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<b>Key Questions</b>	<ul style="list-style-type: none"> <li>➤ Is there a management plan?</li> <li>➤ Is there a harvest strategy / does the management strategy provide advice on appropriate catch levels and management actions in response to current (or expected future) stock status?</li> <li>➤ Are the decisions employed and implemented to achieve desired outcomes, the harvest strategy is likely to work, and whether there is monitoring in place to assess the effectiveness of the harvest strategy.</li> <li>➤ Are there evaluations of the harvest strategy?</li> <li>➤ What are the results of stock assessments since implementation of the harvest strategy?</li> <li>➤ Are targeted species considered vulnerable?</li> <li>➤ Do stock assessments provide management advice?</li> <li>➤ Are fishery-dependent data (e.g. logbooks) collected?</li> </ul>
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<b>Scoring Issue</b>	<b>SG 60</b>
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(e) Shark finning	It is likely that shark finning is not taking place.
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Evaluate if there is evidence to support that fishing activities do not include shark finning on target shark species.

Criteria to be met	<60
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Criteria to be met	There is strong evidence that shark finning is taking place in this fishery.
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Scheme Reference	SFW: 3.2, Ineffective (2)
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What to look for	Regulations governing the management of shark species would detail prohibited acts and required documentation to verify.
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<b>Key Questions</b>	<ul style="list-style-type: none"> <li>➤ Does the fishery interact with shark species?</li> <li>➤ Are shark species targeted, and retained in their entirety?</li> <li>➤ Is there onboard processing of retained sharks?</li> <li>➤ Are there inspection records and documentation to confirm that shark finning is not occurring?</li> </ul>
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PI 1.2.2: Harvest Strategy Control Rules and Tools	There are well defined and effective <b>harvest control rules (HCRs)</b> in place.
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<b>MSC Scoring Issue</b>	<b>SG 60</b>
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(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.
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(c) HCRs evaluation	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.
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Evaluate whether the management decisions and actions employed to manage fishing activities targeted at principal fishing stocks are expected to reduce exploitation. This may be measured by considering the current exploitation rates and associated outcomes.

	<20	20	40
Criteria to be met	F to be adopted at $B_{LIM}$ , as part of <b>HCR</b> , is $>2$ times $F_{MSY}$ or similar, and the stock is not depleted.	F to be adopted at $B_{LIM}$ , as part of <b>HCR</b> , is $>1.5$ to 2 times $F_{MSY}$ or similar, and the stock is not depleted.  <i>OR</i> _____  Main target species unassessed and regulations to constrain fishing mortality for these species are lacking.	F to be adopted at $B_{LIM}$ , as part of <b>HCR</b> , is $>1$ to 1.5 times $F_{MSY}$ or similar, and the stock is not depleted.
Scheme Reference	FS: 1 quantitative (b), 0-1.9	FS: 1 quantitative (b), 2-3.9 / SFW: 3.3, Ineffective (3)	FS: 1 quantitative (b), 4-5.9
Additional Guidance	6a	6a,b	6a

**What to look for** Management plans with defined harvest control rules, regulation and licensing arrangements designed to reduce exploitation. Biomass and fishing mortality estimates related to reference points.

- Key Questions**
- > Is there a management plan?
  - > Are there stock assessments?
  - > Are regulations designed to reduce exploitation?
  - > Is there a clear and binding harvest control rule in place? (Does it consider the ecological role of the stock?)
  - > Is there monitoring to provide evidence that management measures are effectively reducing exploitation?

**PI 1.2.3: Harvest Strategy Information and Monitoring** Relevant information is collected to support the harvest strategy.

MSC Scoring Issue	SG 60
(a) Range of information	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.
(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.

Information and monitoring consider whether information relevant to support the harvest strategy is collected and available. This includes productivity information on the stock and fleet composition.

	<60
Criteria to be met	No data or very minimal data are collected or analyzed.
Scheme Reference	SFW: 3.3, Ineffective (1)

**What to look for** With little related criteria under which to assess the lower range, evaluation focuses on the absence of information and monitoring, recognizing that there are likely to be degrees of information available.

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>➤ Are there stock assessments available for the target stock(s)?</li> <li>➤ Does the management plan detail monitoring and data collection requirements? Specifically, to meet the goals of management?</li> <li>➤ Are there any data collection and monitoring details or guidance in policy documents?</li> <li>➤ Is there information on the composition of the fleet?</li> <li>➤ Are information gaps known?</li> </ul>
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<b>PI 1.2.4: Assessment of Stock Status</b>	There is an adequate assessment of the stock status.
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MSC Scoring Issue	SG 6o
(b) Assessment approach	The assessment estimates stock status relative to generic reference points appropriate to the species category.
(c) Uncertainty in the assessment	The assessment identifies major sources of uncertainty.

Evaluate whether there is information available to conduct stock assessments for stock status determination, and whether the assessment is available and sound.

	<20	20	40
<b>Criteria to be met</b>		There is no stock assessment, no reference points, and/or no evidence to suggest that stock is either above or below reference points.	Overfishing status known for all primary (target) species (has been determined through a peer-reviewed and tested assessment method based on available data). Appropriate action is taken depending on status determination.
<b>Scheme Reference</b>		SFW: 1.1, Moderate (3)	FTUSA: RM-SH1.1, Y1
<b>Additional Guidance</b>		7	2a

<b>What to look for</b>	Stock assessments are critical for management, though there can be reliable estimates of status in the absence of assessments, with appropriate tools. Fishery reports or stock assessments should be available, recent and reliable.
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<b>Key Questions</b>	<ul style="list-style-type: none"> <li>➤ Is there a stock assessment or other fishery evaluation or scientific working group report?</li> <li>➤ Does the report align with the scale and intensity of the fishery?</li> <li>➤ Are there estimates of reference points?</li> </ul>
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## PRINCIPLE 2: ENVIRONMENTAL IMPACT OF FISHING

Criteria under Principle 2<sup>4</sup> considers the impact of the fishery on a range of ecosystem components: non-target species, endangered, threatened and protected (ETP) species, habitats and ecosystems. In assessment of non-target species, we apply the same evaluation criteria for each individual species (corresponding to the MSC’s 2.1.x for “Primary Species” and 2.2.x for “Secondary Species, a distinction that is not made in this set of criteria). Evaluation for each species should be assessed separately, as provided in the accompanying template. For analysts scoring fisheries in P2 at the o-6o level, a decision tree using a dichotomous key approach is provided under **Appendix B: Scoring Decision Trees for P2** and can be used to determine scoring. The decision tree is consistent with the tables below.

PI 2.1.1: Primary Species Outcome	The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI.
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PI 2.2.1: Secondary Species Outcome	The UoA aims to maintain secondary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI.
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MSC Scoring Issue	SG 6o
2.1.1 (a) Main primary species stock status	Main primary species are likely to be above the PRI.  <i>OR</i>  If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.
2.2.1 (a) Main secondary species stock status	Main secondary species are likely to be above biologically based limits.  <i>OR</i>  If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.

	<20	20	40
Criteria to be met	There is at least one <b>main bycatch species</b> in the fishery that is likely to be <b>depleted</b> or <b>overfished</b> , and bycatch removals from this fishery (or a <b>similar fishery</b> , if the data are not available from this fishery) are likely to <b>jeopardize that main bycatch species’</b> viability or rebuilding.	It is likely that bycatch mortality from this fishery (or a <b>similar fishery</b> , if the data are not available from this fishery) <b>jeopardizes the main bycatch species’</b> viability, but these species are not likely to be currently <b>depleted</b> or <b>overfished</b> .	Bycatch removals from this fishery (or a <b>similar fishery</b> , if the data are not available from this fishery) are not likely to currently <b>jeopardize any main bycatch species</b>  <i>AND</i>  The current level of fishing removal from this fishery <b>substantially impacts</b> at least one <b>main bycatch species</b>
Scheme Reference	FS Bycatch of Main Species Step 2	FS Bycatch of Main Species Step 2	FS Bycatch of Main Species Step 2
Additional Guidance	8, 9, 10, 11, 12, 13	12, 13, 10, 11	12, 13, 14

4. According to MSC Fisheries Standard v.2.0, “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”.

**What to look for** Scoring for this PI must be considered in conjunction with identifying the level of information available from the fishery – PI 2.1.3 should be scored before this one. If the fishery scores 60 or lower under PI 2.1.3, this PI should not be scored. If information from this fishery is available, it should be the basis of the scoring, but if the analyst scored 2.1.3 based on a similar fishery (see Additional Guidance 12) then this PI should also be scored based on the same **similar fishery**. Identify the status of all bycatch species in terms of their biomass or abundance and the level of fishing mortality they are experiencing due to this fishery (or the similar fishery) alone, and determine whether that level of fishing mortality is likely to **jeopardize** the species, i.e. hinder the species’ viability or rebuilding. If not, consider whether the cumulative effect of fishing mortality from all fisheries impacting each bycatch species may jeopardize any species’ viability or rebuilding – if this is occurring and the fishery is one of the main contributors to this overall mortality, it is considered to **substantially impact** the species.

- Key Questions**
- Is each bycatch species at healthy abundance, or is it **overfished** or **depleted**?
  - Is the level of fishing mortality each bycatch species experiences due to this fishery too high, i.e. high enough to hinder viability or rebuilding?
  - Is the level of fishing mortality each bycatch species experiences due to the combined effect of all fisheries too high? If so, is this fishery one of the main contributors?

**2.1.2: Primary Species Management Strategy** 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.

MSC Scoring Issue	SG 60
2.1.2 (a) Management strategy in place	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.
2.1.2 (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).
2.2.2 (a) Management strategy in place	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.
2.2.2 (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).

Evaluate whether there is a management strategy and actions employed to mitigate impacts on non-target stocks from fishing activities, and that the management decisions are implemented to achieve desired outcomes. Evaluation of bycatch management is only needed where bycatch is a concern.

	<20	20	40
<b>Criteria to be met</b>	The gear as used in the fishery is not an <b>“exempt gear”</b> (known to have little to no bycatch associated with it) and there are no management measures in place for the purpose of bycatch mitigation.	Fishery does not use an <b>“exempt gear”</b> (known to have little to no bycatch associated with it)  <i>AND</i> Fishery has some measures in place for bycatch mitigation but they are not <b>appropriate management measures</b>	Fishery does not use an <b>“exempt gear”</b> (known to have little to no bycatch associated with it)  <i>AND</i> <b>Appropriate Management Measures</b> are in place to mitigate bycatch but compliance or enforcement are problematic.

Scheme Reference	FS Bycatch of Main Species Step 3	FS Bycatch of Main Species Step 3	FS Bycatch of Main Species Step 3
Additional Guidance	15	15, 16	15, 16

**What to look for** Note that some gear types are considered “exempt” because they are highly selective and typically cause low to no bycatch. More information on “exempt gears” is available in the Additional Guidance 15. For other gears, consider whether there is management in place specifically to address the issue of bycatch, or management in place (for example time or area closures) that may result in mitigation of bycatch concerns. Appropriate bycatch measures should address the most significant bycatch concerns in the fishery. Bycatch mitigation management may include measures that increase selectivity, e.g. via gear modifications or time or area closures, or practices that increase the proportion of bycatch released alive and/or post-release survival.

- Key Questions**
- Is the gear highly selective aka an “exempt gear”?
  - Are management measures in place?
  - Do the measures in place address the most important bycatch concerns?
  - Are they expected to work?
  - Are the management measures enforced/complied with, or are there believed to be problems with enforcement or compliance?

**PI 2.1.3: Primary Species Information** 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.

**PI 2.2.3: Secondary Species Information** 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.

MSC Scoring Issue	SG 60
2.1.3 (a) Information adequacy for assessment of impact on main primary species	<p>Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status.</p> <p><i>OR</i> _____</p> <p>If RBF is used to score PI 2.1.1 for the UoA:</p> <p>Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.</p>
2.2.3 (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><i>OR</i> _____</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>

Evaluate whether there is information available to evaluate impacts of the fishery on bycatch species.

	<20	20	40
Criteria to be met	<p>There is <b>no reliable information</b> on the composition of bycatch in the fishery, and no <b>similar fishery</b> using the same gear type in the same way and targeting the same species in the region which has this level of data on its bycatch, thus the composition of bycatch cannot be inferred.</p> <p><i>AND</i> _____</p> <p>The gear as used in the fishery is not an <b>“exempt” gear</b></p>	<p>There is <b>some reliable information</b> on bycatch composition (either from this fishery or a <b>similar fishery</b>) but no <b>reliable information</b> on the amount of bycatch, and no <b>similar fishery</b> using the same gear type in the same way and targeting the same species in the region which has this level of data on its bycatch, thus the amount of bycatch cannot be inferred.</p> <p><i>AND</i> _____</p> <p>The gear as used in the fishery is not an <b>“exempt” gear</b></p>	<p>There is <b>some reliable information</b> on both composition and amounts of <b>main bycatch species</b> from this fishery or a <b>similar fishery</b>, but <b>monitoring</b> does not provide <b>reliable information on fishery impacts to main bycatch species</b></p> <p><i>AND</i> _____</p> <p>The gear as used in the fishery is not an <b>“exempt” gear</b></p>
Scheme Reference	FS Bycatch of Main Species Step 1	FS Bycatch of Main Species Step 1	FS Bycatch of Main Species Step 1
Additional Guidance	15	15, 16	15, 16
What to look for	<p>Consider whether there is data collection or monitoring that provides information on or can be used to infer which species are caught as bycatch, including not only the most common species caught but also whether rare but vulnerable species may also be caught. Also consider whether data collection or monitoring provide information that can be used to infer whether the fishery has a negative impact on bycatch species. If these data are not available in the fishery, look at whether data can be found from a fishery using the same gear type and in the same region (see definition of “similar fishery” with respect to bycatch under 2.1.1 in Additional Guidance 12).</p>		
Key Questions	<ul style="list-style-type: none"> <li>&gt; Is bycatch monitored?</li> <li>&gt; Are data on bycatch collected and reported?</li> <li>&gt; Are the main bycatch species known?</li> <li>&gt; Is there quantitative or qualitative data available on impacts on bycatch species?</li> </ul>		
PI 2.3.1: ETP Species Outcome	<p>The UoA meets national and international requirements for protection of ETP species. The UoA does not hinder recovery of ETP species.</p>		
MSC Scoring Issue	SG 60		
2.3.1 (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.		
2.3.1 (b) Direct effects	Known direct effects of the UoA are likely to not hinder recovery of ETP species.		

Evaluate the effects of the fishery on incidental take of ETP species relative to the viability or rebuilding of these species. Evaluate the outcomes of direct effects (of fishing related mortality) on ETP species from target fishing activity.

<60

Criteria to be met	ETP interactions from this fishery (or ETP interactions from a <b>similar fishery</b> , if data from the fishery under consideration are not available) are likely to <b>jeopardize the viability or rebuilding</b> of one or more <b>ETP species</b> .
Scheme Reference	FS ETP Bycatch Step 2
Additional Guidance	12, 20, 21

What to look for	Scoring for this PI must be considered in conjunction with identifying the level of information available from the fishery – PI 2.3.3 should be scored before this one. If the fishery scores 60 or lower under PI 2.3.3, this PI should not be scored. If information from this fishery is available, it should be the basis of the scoring, but if the analyst scored 2.1.3 based on a similar fishery (see Additional Guidance 12) then this PI should also be scored based on the same similar fishery. If impacts of the fishery on ETP species are known, consider whether the current level of ETP mortality caused by <i>this fishery</i> is impacting the success of the species, either reducing its population or preventing its population from rebuilding. If reference points for ETP mortality are in place, compare the actual mortality rate to these reference points. If a fishery does not itself cause a level of mortality high enough that it impairs the ETP species’ ability to rebuild, the fishery will score $\geq 60$ even if it is a contributor to a cumulative level of mortality that is cause for concern. If impacts of the fishery on ETP species are not known, this may be inferred based on knowledge of expected impacts based on similar fisheries (using the gear type and in the same region – see definition of “similar fishery” with respect to ETP bycatch under 2.3.1 in Additional guidance).
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Key Questions	<ul style="list-style-type: none"> <li>➤ Are any ETP species caught by the fishery?</li> <li>➤ Is the mortality rate caused by <i>this fishery</i>, if known, above reference points and/or a level of mortality that would allow the ETP species to rebuild?</li> <li>➤ If information from this fishery is not known, is there a <b>similar fishery</b> (based on gear type and region) that can be used to evaluate the questions above?</li> </ul>
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PI 2.3.2: ETP Species Management	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> <li>➤ meet national and international requirements; and</li> <li>➤ ensure the UoA does not hinder recovery of ETP species.</li> </ul> <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>
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MSC Scoring Issue SG 60

2.3.2 (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.
2.3.2 (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. (refer to MSC guidance for use)
2.3.2 (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).



Evaluate that there is a management strategy with management measures designed to reduce catch and not hinder the recovery of ETP species, and evaluate whether the management decisions employed are implemented to achieve desired outcomes.

	<20	20	40
Criteria to be met	The gear as used in the fishery is not an <b>exempt gear</b> or known not to have ETP interactions  <i>AND</i> No management measures are in place for the purpose of ETP bycatch mitigation.	Fishery not using <b>exempt gear</b> or known not to have ETP interactions  <i>AND</i> Fishery has some measures in place for the purpose of ETP bycatch mitigation but these are not <b>Appropriate Management Measures</b>	Fishery not using <b>exempt gear</b> or known not to have ETP interactions  <i>AND</i> <b>Appropriate Management Measures</b> are in place to mitigate ETP bycatch but compliance or enforcement are problematic
Scheme Reference	FS ETP Interactions Step 3	FS ETP Interactions Step 3	FS ETP Interactions Step 3
Additional Guidance	22	22, 23	22, 23

What to look for	If fishery does not have ETP bycatch or is using an “exempt gear” (gear type known to be highly selective with low risk of ETP interactions) it will score $\geq 60$ . Otherwise, consider whether management measures are put in place specifically to address ETP bycatch, or management measures that are in place for other reasons (such as closed areas/ seasons) may also mitigate ETP bycatch. If there are management measures in place, look for whether they are considered likely to work to address the most significant ETP bycatch concerns – this may include comparing the measures in place to known best practice mitigations for that type of fishery, reviewing biological opinions or similar expert analyses, and/or considering how similar measures have worked in this fishery or other fisheries with similar ETP bycatch concerns.
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Key Questions	<ul style="list-style-type: none"> <li>&gt; Are management measures that may reduce ETP bycatch in place?</li> <li>&gt; Do these management measures address the most substantial ETP bycatch species and concerns?</li> <li>&gt; Are these measures expected or likely to work?</li> </ul>
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PI 2.3.3: ETP Species Information	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> <li>&gt; information for the development of the management strategy;</li> <li>&gt; information to assess the effectiveness of the management strategy; and</li> <li>&gt; information to determine the outcome status of ETP species.</li> </ul>
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MSC Scoring Issue	SG 60
2.3.3 (a) Information adequacy for assessment of impacts	Qualitative information is adequate to estimate the UoA related mortality on ETP species.  <i>OR</i> _____  If RBF is used to score PI 2.3.1 for the UoA, Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.
2.3.3 (b) Information adequacy for management strategy	Information is adequate to support measures to manage the impacts on ETP species.

Evaluate whether there is information to assess impact on ETP species by fishing activities.

	<20	20	40
Criteria to be met	There is <b>no reliable information</b> on the composition of ETP bycatch in the fishery, and no <b>similar fishery</b> using the same gear type in the same way and targeting the same species in the region which has this level of data on its ETP interactions, thus the composition of ETP bycatch cannot be inferred.  <i>AND</i> _____  The gear as used in the fishery is not an “ <b>exempt</b> ” gear	There is <b>some reliable information</b> on ETP bycatch composition (either from this fishery or a similar fishery) but no reliable information on the amount of ETP bycatch, and no <b>similar fishery</b> using the same gear type in the same way and targeting the same species in the region which has this level of data on its ETP bycatch, thus the amount cannot be inferred.  <i>AND</i> _____  The gear as used in the fishery is not an “ <b>exempt</b> ” gear	There is <b>some reliable information</b> on both composition and amounts of ETP bycatch from this fishery or a <b>similar fishery</b> , but <b>monitoring</b> does not provide reliable information on <b>fishery impacts to ETP species</b>  <i>AND</i> _____  The gear as used in the fishery is not an “ <b>exempt</b> ” gear
Scheme Reference	FS ETP Interactions Step 1	FS ETP Interactions Step 1	FS ETP Interactions Step 1
Additional Guidance	24, 12, 22	24, 12, 22	24, 25, 26, 22

What to look for	Consider whether there is data collection or monitoring that provides information on or can be used to infer which ETP species are potentially caught in the fishery. Also consider whether data collection or monitoring provide information that can be used to infer whether the fishery has a negative impact on ETP bycatch species. If these data are not available in the fishery, look at whether data can be found from a fishery using the same gear type and in the same region (see definition of “similar fishery” with respect to ETP bycatch under 2.3.1 in the guidance document).
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Key Questions	<ul style="list-style-type: none"> <li>➤ Is ETP bycatch monitored?</li> <li>➤ Are data on ETP bycatch collected and reported?</li> <li>➤ Are the main ETP bycatch species known?</li> <li>➤ Is there quantitative or qualitative data available on impacts on ETP bycatch species?</li> </ul>
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PI 2.4.1: Habitat Outcome	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.
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MSC Scoring Issue	SG 60
2.4.1 (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.
2.4.2 (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.

Evaluate impacts to habitats by fishing activity.

	<20	20	40
Criteria to be met	<p><b>Best Available Information</b> suggests the fishery currently reduces structure and function of <b>habitats</b> within the footprint of the fishery to a point where it causes <b>serious or irreversible harm</b></p> <p><i>AND</i> _____</p> <p>the gear as used in the fishery is not an “exempt” gear</p>	<p><b>Best Available Information</b> suggests the fishery currently does NOT reduce structure and function of <b>habitats</b> within the footprint of the fishery to a point where it causes <b>serious or irreversible harm</b>, but is likely to do so in the future</p> <p><i>AND</i> _____</p> <p>the gear as used in the fishery is not an “exempt” gear</p>	
Scheme Reference	FS Habitat Step 2	FS Habitat Step 2	
Additional Guidance	27, 28, 29	27, 28, 29	

What to look for	<p>Scoring for this PI must be considered in conjunction with identifying the level of information available from the fishery – PI 2.4.3 should be scored before this one. If the fishery scores 60 or lower under PI 2.4.3, this PI should not be scored.</p> <p>Note that some gear types are considered “exempt” because they do not cause habitat damage – this mainly applies to pelagic/midwater gear that do not contact the seafloor. More information on “exempt gears” with respect to habitat is available in the guidance document. For other gears, consider whether there are either known impacts to the habitat (See Additional Guidance 30) where fishing occurs, or impacts that can be presumed based on the type of fishing gear used and the resilience of the habitat. Generally, seafloor habitats are considered most vulnerable to damage from fishing, so pelagic gears that do not contact the seafloor typically have minimal impact on habitat. Of bottom-tending gears, those that are mobile (such as trawls and dredges) have a greater impact than those that are fished as stationary gear (such as bottom longlines and traps) when fished in similar habitat. Habitat vulnerability should also be considered. Soft sediment habitats are typically less vulnerable than rocky or boulder habitats, and reef habitats are highly vulnerable. Fishing intensity and the spatial footprint of fishing also play a role, with less intense or frequent fishing activity and a limited fishing footprint contributing to lower impact overall.</p>
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<b>Key Questions</b>	<ul style="list-style-type: none"> <li>➤ Does the gear contact the seafloor?</li> <li>➤ Is it an “exempt gear”?</li> <li>➤ Is the gear mobile or stationary?</li> <li>➤ What type of habitat is being fished?</li> <li>➤ How intensively and frequently is the area fished?</li> <li>➤ What is the spatial footprint of fishing?</li> <li>➤ What do available data suggest about impacts of the fishery on the habitat within the footprint of the fishery?</li> </ul>
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<b>PI 2.4.2: Habitat Management Strategy</b>	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.
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MSC Scoring Issue	SG 6o
2.4.2 (a) Management strategy in place	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 8o level of performance (2.4.1a, b - see Habitat Status).
2.3.2 (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).
2.3.2 (d) Compliance with management requirements and other MSC UoAs’/non-MSC fisheries’ measures to protect VME	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.

Evaluate whether management strategies and actions are employed to mitigate habitat impacts from fishing activities, and whether the fishery complies with the measures.

	<20	20	40
<b>Criteria to be met</b>	Gear as used in the fishery is NOT an “exempt gear” (a gear known to have little or no habitat interactions)	Gear as used in the fishery is NOT known to have little or no habitat interactions (an “exempt gear”)	Gear as used in the fishery is NOT known to have little or no habitat interactions (an “exempt gear”)
	<i>AND</i> _____	<i>AND</i> _____	<i>AND</i> _____
	the fishery does not have only minimal interactions with habitat	fishery does not have only minimal interactions with habitat	fishery does not have only minimal interactions with habitat
	<i>AND</i> _____	<i>AND</i> _____	<i>AND</i> _____
	No management measures are in place to mitigate or reduce habitat interactions	Management measures are in place to mitigate or reduce habitat interactions, but they are not appropriate management measures	Appropriate Management measures are in place to mitigate or reduce habitat interactions but compliance or enforcement are problematic
<b>Scheme Reference</b>	FS Habitat Step 3	FS Habitat Step 3	FS Habitat Step 3
<b>Additional Guidance</b>	31	31, 32	31, 32

**What to look for** Note that some gear types are considered “exempt” because they do not cause habitat damage – this mainly applies to pelagic/midwater gear that do not contact the seafloor. More information on “exempt gears” with respect to habitat is available in Additional Guidance. For other gears, consider whether there is management in place specifically to address the issue of habitat, or management in place (for example time or area closures) that may result in mitigation of habitat. Mitigation of habitat impacts generally involves either gear modifications that reduce the intensity of gear contact with the seafloor or management measures that reduce or constrain the frequency and/or spatial extent of trawling.

- Key Questions**
- Are management measures in place either to reduce the intensity of impact on the seafloor, or to constrain or reduce frequency or spatial extent of trawling?
  - Are these measures expected to work?
  - Are the management measures enforced/complied with, or are there believed to be problems with enforcement or compliance?

**PI 2.4.3: Habitats Information** 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.

MSC Scoring Issue	SG 60
2.4.3 (a) Information Quality	The types and distribution of the main habitats are broadly understood.  <i>OR</i> _____  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.
2.4.3 (b) Information adequacy for assessment of impacts	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. (overlap)  <i>OR</i> _____  If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.

Evaluate whether there is information available on habitat types and locations in order to assess impacts on habitats encountered by the target fishery.

	<60
<b>Criteria to be met</b>	There is no reliable information to at least generally characterize fishery impacts on habitat  <i>AND</i> _____  The gear as used in the fishery is NOT known to have little to no impact on habitat (an “exempt gear”)
<b>Scheme Reference</b>	FS Habitat Step 1
<b>Additional Guidance</b>	33, 30, 31

**What to look for** Fisheries using “exempt gear” (see Additional Guidance 31) will automatically score >6 regardless of data availability. Otherwise, habitat data collection by the fishery may include information on and/or monitoring of: the degree to which the gear contacts the seafloor (keeping in mind that in some cases, midwater trawls or purse seines may contact the seafloor when fishing near the bottom), the frequency of such impacts, and/or the spatial footprint of fishing. Bycatch data can also in some cases be useful in assessing habitat impacts; for example it can be used to determine whether benthic species such as sponges or corals are impacted by the fishery, although such impacts can also occur without being observable in the bycatch collected. Analyst should also consider information external to the fishery, such as scientific peer-reviewed or government studies that may address the status of the benthic ecosystem in fished vs unfished areas or changes in the status of these ecosystems over time. “Some reliable information” can include qualitative information or generic information that yields an incomplete, broad understanding of the timing, location, and severity of the impacts of the fishery (coastal fisheries). If no information of the sort listed above is available, the fishery should score <60. See also definition of “some reliable information” in the Guidance Document.

- Key Questions**
- > Does the gear touch the seafloor?
  - > Is the footprint of the fishery mapped?
  - > Is the habitat of the fished area (sediment type, level of natural disturbance, presence of any VMEs) mapped or well understood?
  - > Are data on the location of the fishing activity and level of effort, which can be used to infer frequency and extent of impacts, collected and reported?
  - > Are there data from the fishery that may be used to infer impacts, such as benthic bycatch?
  - > Are there scientific studies on the status of the benthic ecosystem?

**PI 2.5.1: Ecosystem Outcome** The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.

**MSC Scoring Issue** SG 60

2.5.1 (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.

Evaluate the outcomes of impacts to ecosystem elements by fishing activity.

	<20	20	40
<b>Criteria to be met</b>	<b>Best Available Information</b> suggests the fishery currently disrupts <b>key elements of ecosystem structure and function</b> to a point that <b>serious or irreversible harm</b> occurs.	<b>Best Available Information</b> suggests the fishery currently does NOT disrupt <b>key elements of ecosystem structure and function</b> to a point that <b>serious or irreversible harm</b> occurs, but is likely to do so in the future.	
<b>Scheme Reference</b>	FS Ecosystem Step 2	FS Ecosystem Step 2	
<b>Additional Guidance</b>	27, 34, 35	27, 34, 35	

**What to look for**

Scoring for this PI must be considered in conjunction with identifying the level of information available from the fishery – PI 2.5.3 should be scored before this one. If the fishery scores 60 or lower under PI 2.5.3, this PI should not be scored.

Serious or irreversible harm in the context of a **fishery’s impact on the ecosystem** (Additional Guidance: 36) can include trophic impacts (e.g., trophic cascades or reduction of prey species to a point where the populations of predator species are negatively affected), alternate stable states, reduction in keystone species, etc. The potential for ecosystem impacts should be considered for all fisheries, but are particularly of concern is fisheries targeting or impacted key ecological species such as forage species or top predators.

- Key Questions**
- What is the ecological role of each species impacted by the species?
  - Does available information suggest that these species are affected to a point that would cause ecological harm?
  - Is there evidence that the ecosystem’s productivity, resilience, and ecosystem services have been maintained?
  - Is there evidence of phase shifts or other ecological shifts in the system?
  - If so, does the evidence suggest these changes are caused by fishing?
  - Do ecosystem indicators exist and if so, are they above or below ecosystem reference points?

**PI 2.5.2: Ecosystem Management Strategy** | There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.

MSC Scoring Issue	SG 60
2.5.2 (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.
2.5.2 (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).

Evaluate whether management strategies and actions are employed to mitigate impacts on the ecosystem from fishing activities.

	<20	20	40
<b>Criteria to be met</b>	No measures are in place to manage the <b>impacts of the fishery on the ecosystem</b> .	Measures are in place to manage the <b>impacts of the fishery on the ecosystem</b> , but they are not <b>appropriate management measures</b>	<b>Appropriate management measures</b> to manage <b>impacts of the fishery on the ecosystem</b> are in place, but compliance or enforcement is problematic
<b>Scheme Reference</b>	FS Ecosystem Step 3	FS Ecosystem Step 3	FS Ecosystem Step 3
<b>Additional Guidance</b>	36, 37	36, 37	37, 36

<b>What to look for</b>	Consider whether there is management in place specifically to address the issue of ecosystem impacts, or management in place (for example time or area closures) that may result in mitigation of potential ecosystem impacts. Mitigation of ecosystem impacts may include implementation of <b>Ecosystem-based fisheries management EBFM</b> (further defined in Additional Guidance 38 but including the use of ecosystem indicators based on set goals and targets, the assessment of status and risk, and the development of an adaptive scheme that monitors ecosystem status and sets corrective or precautionary measures), or measures that address specific ecological concerns.
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<b>Key Questions</b>	<ul style="list-style-type: none"> <li>➤ Are management measures in place?</li> <li>➤ Do the measures in place address the most important ecosystem concerns?</li> <li>➤ Are they expected to work?</li> <li>➤ Are the management measures enforced/complied with, or are there believed to be problems with enforcement or compliance?</li> </ul>
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<b>PI 2.5.3: Ecosystem Information</b>	There is adequate knowledge of the impacts of the UoA on the ecosystem.
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<b>MSC Scoring Issue</b>	<b>SG 60</b>
2.5.3 (a) Information quality	Information is adequate to identify the key elements of the ecosystem.
2.5.3 (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.

<b>Evaluate whether there is information available to identify key ecosystem elements and there is information available to assess ecosystem impacts by the target fishery.</b>	
	<b>&lt;60</b>
<b>Criteria to be met</b>	There is no reliable information to at least generally characterize the ecosystem and the fishery’s impacts on the ecosystem.
<b>Scheme Reference</b>	FS Ecosystem Step 1
<b>Additional Guidance</b>	39, 40, 36

<b>What to look for</b>	The first piece of information to consider is whether the ecosystem is characterized – i.e. is the natural species composition, trophic interactions, etc. understood? Secondly, consider whether there are data that would allow for assessment of the fishery’s impact on the ecosystem, beyond a single-species context. In many cases, the relevant information for monitoring ecosystem impacts may come from a combination of fishery-dependent and fishery-independent sources, so both should be considered. In particular, if the fishery impacts species that are likely to play an essential role in the ecosystem, such as forage species or top predators, look at whether either the fishery monitors the status both of these species and those that may be impacted by trophic cascades or food scarcity due to fishing; or whether such information is available in scientific studies. Information available does not need to be peer-reviewed scientific studies or data collected by the fishery and does not need to be part of a comprehensive ecosystem evaluation to score >6; information can include expert knowledge and local ecological knowledge.
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## Key Questions

- Is the ecosystem composition studied?
- Are there data available from the fishery or scientific studies to characterize the fishery's impacts on key ecosystem species?
- Are there data available, either from the fishery, from expert or traditional ecological knowledge, or from scientific studies, sufficient to assess or infer trophic impacts, e.g. data on population trends in predator species such as seabirds and marine mammals in the case of forage fisheries?

## PRINCIPLE 3: EFFECTIVE MANAGEMENT

Criteria under Principle 3<sup>5</sup> considers whether there is an institutional and operational framework, appropriate to the size and scale of the fishery, that is capable of delivering sustainable fisheries in accordance with Principles 1 and 2.

These indicators evaluate the framework in place to ensure a management authority can fulfill its requirements to achieve its objective by considering the processes and mechanisms in place, separate from the management strategies and activities to achieve the outcomes. Indicators under 3.1 address the governance systems in place, mechanisms and associated inputs needed to effectively maintain a management system. Indicators under 3.2 address fishery specific management, and account for the specific systems and the outcomes achieved.

Performance Indicators 3.1.2 (consultation, roles and responsibilities), 3.1.3 (long term objectives), and 3.2.4 (monitoring and management performance evaluation) are not included within the assessment tool, these indicators measure aspects of performance that are not critical for stepwise progress below 60 and there were no available criteria.

PI 3.1.1: Legal and/or customary framework	The management system exists within an appropriate and effective legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> <li>➤ Is capable of delivering sustainability in the UoA(s)</li> <li>➤ Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and</li> <li>➤ Incorporates an appropriate dispute resolution framework.</li> </ul>
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MSC Scoring Issue	SG 60
(a) Compatibility of laws or standards with effective management	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.
(b) Resolution of disputes	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.
(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.

Evaluate the presence or absence of an appropriate and effective legal system, whether there are structures in place for dispute resolution, and whether the management system has a mechanism to respect the legal rights by custom.<sup>6</sup>

	<60
Criteria to be met	There is no evidence that local, national, and international laws regarding fishing practices are being broken.
Scheme Reference	FTUSA: RM - GOV 1.1, Yo
Additional Guidance	41

What to look for	Fisheries performing well should have an established national legal system and national, regional and international cooperation in the management of fisheries.
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5. According to MSC Fisheries Standard v.2.0, “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”.

6. Available criteria from related schemes does not include content for respect for rights and customs, ineffective national legal systems, lack of dispute resolution.

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>➤ Is there a fisheries policy?</li> <li>➤ Is the policy implemented nationally through management plans or similar?</li> <li>➤ Does the legal framework consider all levels of management – local, regional, national, international?</li> <li>➤ Is there engagement with appropriate RFMOs, if applicable?</li> <li>➤ Is there documentation that the nation and fishery have complied with the laws?</li> </ul>
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PI 3.1.2: Consultation, roles and responsibilities	<p>The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties.</p> <p><i>This indicator is not evaluated in this assessment tool.</i></p>
PI 3.1.3: Long Term Objectives	<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><i>This indicator is not evaluated in this assessment tool.</i></p>
PI 3.2.1: Fishery Specific Objectives	<p>The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2.</p>

<b>MSC Scoring Issue</b>	<b>SG 60</b>
(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-specific management system.</p>

Evaluate whether there are any clear fishery-specific objectives that align with achieving sustainability.

	<20	20	40
<b>Criteria to be met</b>	There are no management objectives for the stock.	A management plan for the resource is in place but it has been assessed by scientific experts to be ‘not precautionary’.	
<b>Scheme Reference</b>	FS: 1 qualitative, <6	FS: 1 qualitative, <6	
<b>Additional Guidance</b>	42	42	

<b>What to look for</b>	<p>A fishery specific management plan or related documentation should identify clear objectives to achieve rational and sustainable fisheries and economic outcomes. A management plan exists but is determined to not be precautionary (taking risk into consideration) in its approach to managing the resource.</p>
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<b>Key Questions</b>	<ul style="list-style-type: none"> <li>➤ Is there a fishery specific management plan, regulations or similar?</li> <li>➤ Are there clear objectives for the management of the fishery?</li> <li>➤ Do those objectives define desired ecological outcomes?</li> <li>➤ Does the management plan account for risk and uncertainty in its guidance and regulations?</li> </ul>
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**PI 3.2.2: Decision-making processes** The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives and has an appropriate approach to actual disputes in the fishery.

MSC Scoring Issue	SG 6o
(a) Decision-making processes	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.
(b) Responsive-ness 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.
(c) Use of precautionary approach	No SG 6o
(d) Accountability and transparency of management system and decision-making processes	Some information on the fishery’s performance and management action is generally available on request to stakeholders.
(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.

Evaluate whether 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. Evaluate whether there are decision-making processes that are triggered for fishery-related issues, whether the decision-making processes result in measures and strategies within the fishery specific management system, whether there is access to information and data and transparency of that information to stakeholders.

	<20	20	40
Criteria to be met	Decisions are not made transparently.	There is no mechanism in place to effectively address user conflicts.	<p>All major decisions of the Fishing Association are discussed and approved by members according to a free, fair, and transparent voting procedure.</p> <p><i>OR</i> _____</p> <p>A signed agreement includes a mechanism to resolve conflicts between the Certificate Holder and the Registered Fishermen (fishermen engaged in the FIP).</p> <p><i>OR</i> _____</p> <p>Records, books, and documentation are accessible to all members of the Fishing Association. Methods for accessibility to members shall take into consideration languages and literacy of the members.</p> <p><i>OR</i> _____</p> <p>All existing fishery management rules, as well as the species lists and information required, are compiled into a single document.</p>

Scheme Reference	SFW: 3.5, Ineffective (2)	SFW: 3.5, Moderately Effective (2)	FTUSA: STR - FA 1.4, Yo / FTUSA: TR - CA 1.1, Yo / FTUSA: STR - FA 2.6, Y1 / FTUSA: RM - FD 2.2, Y1
Additional Guidance	43a	43b	43c

What to look for	There should be identified and understood processes for decision making, these include the rules that govern participation and activity in the fishery. The decision-making process will need to be in place to help determine management decisions and engage stakeholders and resolve disputes that may occur.
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|---------------|---|
| Key Questions | <ul style="list-style-type: none"> <li>➤ Is there a documented decision-making process and is it available to fishers?</li> <li>➤ Looking at a previous important decision relating to the fishery, can the process by which that decision was taken be clearly described?</li> <li>➤ Is the decision-making process set out either in governing legislation or in relevant policy documents of the fishery management plan?</li> <li>➤ How has scientific advice been used in the management process? Do managers have a record of following scientific advice?</li> <li>➤ Is there publicly available information documenting decisions?</li> </ul> |
|---------------|---|

PI 3.2.3: Compliance and Enforcement	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.
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MSC Scoring Issue	SG 60
(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.
(b) Sanctions	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.
(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.
(d) Systematic non-compliance	No SG 60

Evaluate whether the fishery management system has mechanisms for monitoring, control and surveillance, whether there are sanctions to deter and address non-compliance and that these are known, and whether fishers generally comply with the management system.

	<20	20	40
Criteria to be met	As a measure of compliance to catch limits: Catches are >50% over catch limits set by managers.	As a measure of compliance to catch limits: Catches are >37.5% but ≤50% over catch limits set by managers.  <i>OR</i> _____  The scientific body that officially conducts regular stock assessments highlights that the magnitude of IUU fishing is unknown or flags it as a real problem for the stock.  <i>OR</i> _____  Monitoring is lacking or believed to be inadequate. Enforcement is lacking or believed to be inadequate, or compliance is known to be poor.	As a measure of compliance to catch limits: Catches are >25% but ≤37.5% over catch limits set by managers.
Scheme Reference	FS: score 3 quantitative, 0-1.9	FS: score 3 quantitative, 2-3.9 / FS: score 3 qualitative, <6;  SFW: 3.4, Ineffective	FS: score 3 quantitative, 4-5.9
Additional Guidance	44a	43b,c	43a
What to look for	There should be a monitoring, control and enforcement system that collects information on fishing activity and deters illegal operations. Monitoring will occur both from fishery participants and through enforcement officers. Documentation of fishery activity should be able to detail whether there has been compliance with regulations, the monitoring system in place and what sanctions, if any, are applied.		
Key Questions	<ul style="list-style-type: none"> <li>&gt; Is there a national monitoring system written into the fisheries policy?</li> <li>&gt; Is there a management plan that details a monitoring system for the fishery?</li> <li>&gt; Are there enforcement agents that conduct inspections?</li> <li>&gt; Do fishers report catches? Are there catch limits?</li> <li>&gt; Has the scientific body identified any concerns over potential misreporting?</li> <li>&gt; Are there incentives for misreporting catches?</li> </ul>		
PI 3.2.4: Monitoring and management performance evaluation	<p>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.</p> <p><i>This indicator is not evaluated in this assessment tool.</i></p>		

## ADDITIONAL CRITERIA

**IUU Fishing:** Illegal, unreported and unregulated (IUU) fishing is defined by FAO<sup>7</sup>.

**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.

### MSC: Box GSA2, IUU fishing

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.

Evaluate whether there is any illegal, unreported and unregulated fishing taking place and if the fishery has strategies in place to combat IUU.

	<20	20	40
Criteria to be met	Management strategy and implementation nonexistent) Substantial illegal fishing; 25% or more of the product is caught illegally.	Bycatch management strategy and implementation nonexistent) Fishery does not comply with all relevant legal requirements regarding bycatch.	An illegal, unreported, and unregulated (IUU) enforcement strategy has been created and its implementation has begun. The strategy identifies and reports IUU fishing in the area to the relevant authorities.

7. FAO (2002) Implementation of the International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing. FAO Technical Guidelines for Responsible Fisheries 9. Rome: Food and Agriculture Organization, FAO. Online: <http://www.fao.org/docrep/005/y3536e/y3536e00.HTM>

Scheme Reference	SFW: 3.1, critical	SFW: 3.2, Ineffective (3)	FTUSA: RM - GOV 1.2, Y1
Additional Guidance	45a	45b	45c

What to look for	Fisheries legislation should detail policies around IUU and include whether management agencies must develop appropriate monitoring, control and surveillance activities. Records of court cases and information on MCS mechanisms in place (such as VMS, at sea and landings vessel inspections, logbook, sales note and landing declarations, landing restrictions, etc. would be useful sources for questioning IUU activity. These may include regular MSC reports and fishery management plans.
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Key Questions	<ul style="list-style-type: none"> <li>➤ Is there a monitoring, control and enforcement (MCS) system and does the MCS system contain all relevant tools/mechanisms to minimise the risk of IUU, including informal mechanisms?</li> <li>➤ Is the country a signatory on the Port State Measures Agreement and other conservation and management measures adopted by RFMOs?</li> <li>➤ Has the MCS system been designed with an understanding of the likely risks of IUU and shaped accordingly?</li> <li>➤ Do public reports, such as agency reports (e.g. fishery meetings, annual reports and stakeholder committee minutes) detail compliance information and details of fishery offences and prosecutions?</li> <li>➤ Does the MCS system adequately cover all vessels in the fishery and all areas where the fishery operates?</li> </ul>
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**“Ghost fishing” and impacts from gear loss:** FAO defines ghost fishing<sup>8</sup> as “the accidental capture of aquatic organisms by fishing gear (usually gill nets, or traps, pots, etc.) that has been lost or discarded into the sea and which continues to entangle or trap aquatic animals.”

Criteria that relate to ghost fishing and gear loss are captured in P2 indicators that fishing operations 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); minimize mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive;
- Implement appropriate fishing methods designed to minimize adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas; and
- Minimize operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.

8. <http://www.fao.org/faoterm/en/?defaultCollId=21>



**MSC Box GSA7: “Ghost Fishing” and impacts of gear loss**

Minimize loss of fishing gear.

Evaluate whether there are management measures designed to minimize the loss of fishing gear and recover lost gear.

	<60
Criteria to be met	<p>If a fishery has a demonstrated concern with or high likelihood of ghost fishing (of target or non-target species), management measures are non-existent.</p> <p><i>OR</i></p> <p>Insufficient ghost fishing strategy in place, given potential impacts.</p>
Scheme Reference	SFW: 3.2, Ineffective (4) /
	SFW: 3.2, Ineffective
Additional Guidance	21a,b

**What to look for** Fishery management plans or management agencies should include guidance and/or strategies for the mitigation and recovery of lost fishing gear.

- Key Questions**
- > Does the fishery management plan, or related documents, provide strategies to minimize gear loss?
  - > Are there measures to assess, minimize, and mitigate the impacts of derelict gear from the fishery (e.g., gear modifications, gear-tending procedures, etc.)?
  - > Are fishermen required to report lost gear?
  - > Does the management agency implement a time-sensitive requirement for reporting gear loss and location?

## APPENDIX A: ADDITIONAL GUIDANCE

Additional guidance is provided for specific criteria from the referenced source schemes. The language has been modified for application in this tool.

Additional resources and guidance for Fishery Improvement Projects can be found on the FisheryProgress Resources Page at <https://fisheryprogress.org/resources>.

### PI 1.1.1

1. Measure the scale of biomass in relation to reference points (source: FishSource). It should be noted that MSC criteria are looking at the probability that biomass is above the point where recruitment would be impaired, consider the certainty of the data you use in this determination.
  - a. **Maximum Sustainable Yield (MSY):** 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.
  - b. **Biomass:** The total weight of a group (or stock) of living organisms (e.g. fish, plancton) or of some defined fraction of it (e.g. spawners), in an area, at a particular time.
  - c. **B<sub>MSY</sub>:** Biomass corresponding to Maximum Sustainable Yield from a production model or from an age-based analysis using a stock recruitment model. Often used as a biological reference point in fisheries management, it is the calculated long-term average biomass value expected if fishing at F<sub>MSY</sub>.
  - d. **F<sub>MSY</sub>:** The fishing mortality rate which, if applied constantly, would result in Maximum Sustainable Yield (MSY). Used as a biological reference point, F<sub>MSY</sub> is the implicit fishing mortality target of many regional and national fishery management authorities and organizations.
  - e. **Point of recruitment impairment (PRI):** The stock level below which recruitment may be impaired.
  - f. **Overfishing:** The state of a stock subject to a level of fishing effort or fishing mortality such that a reduction of effort would, in the medium term, lead to an increase in the total catch. Often referred to as overexploitation and equated to biological overfishing, it results from a combination of growth overfishing and recruitment overfishing and occurs often together with ecosystem overfishing and economic overfishing.
  - g. If the current biomass (B<sub>CURRENT</sub>) and biomass limit reference point (B<sub>LIM</sub>) are both available, divide B<sub>CURRENT</sub> by B<sub>LIM</sub>.
    - i. A resulting ratio between 0 and <math>1/3</math> corresponds to a scoring level of <math>20</math>.
    - ii. A resulting ratio between <math>1/3</math> and <math>2/3</math> corresponds to a scoring level of <math>20</math>.
    - iii. A resulting ratio between <math>2/3</math> and <math>1</math> corresponds to a scoring level of <math>40</math>.
  - h. If no B<sub>LIM</sub> is defined, divide B<sub>CURRENT</sub> by the target biomass reference point (B<sub>TARGET</sub>).
    - i. A resulting ratio between 0 and <math>1/6</math> corresponds to a scoring level of <math>20</math>.
    - ii. A resulting ratio between <math>1/6</math> and <math>1/3</math> corresponds to a scoring level of <math>20</math>.
    - iii. A resulting ratio between <math>1/3</math> and <math>1/2</math> corresponds to a scoring level of <math>40</math>.
2. In the absence of biomass reference points, apply the known fishing mortality and consider its levels relative to the reference point level at which maximum sustainable yield may be achieved, or a higher level where appropriate.

- a. Consider the fishing mortality rates next to defined targets set by managers. If the target fishing mortality rate ( $F_{\text{TARGET}}$ ) is defined by managers, and has been evaluated by scientists to be precautionary, or is less than or equal to ( $\leq$ ) a scientifically advised target  $F$ , divide current fishing mortality rate ( $F_{\text{CURRENT}}$ ) by  $F_{\text{TARGET}}$ . If  $F_{\text{TARGET}}$  has not been evaluated as to its precaution or was found not to be precautionary, use a scientific advised target instead (source: FishSource).
- A resulting ratio  $>2.5$  corresponds to a scoring level of  $<20$ .
  - A resulting ratio between  $>2$  and  $2.5$  corresponds to a scoring level of  $20$ .
  - A resulting ratio between  $>1.5$  and  $2$  corresponds to a scoring level of  $40$ .
- 
- b. At the  $20$  level, additional criteria evaluate whether fishing mortality from all sources is above a sustainable level, i.e., a level that will allow a population to maintain abundance at or rebuild to  $B_{\text{MSY}}$  or a suitable proxy (e.g., overfishing is occurring). When determining whether a level of impact is ‘appropriate given the species ecological role’, analysts should consider that for certain taxa that have an exceptionally important role in the ecosystem, reference points should be based on ecosystem considerations (i.e. maintaining enough biomass to allow the species to fulfill its ecological role), rather than MSY or single-species considerations (source: Seafood Watch).
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- c. At the  $40$  level, additional criterion evaluates that overfishing status is known for all primary species. The criterion sets the expectation that the results of stock assessments should be included in the Fishery Management Plan (FMP), or related documents. If overfishing is occurring, the FMP includes a strategy with stated goals to reduce fishing pressure on the species and eliminate overfishing within two years. In fisheries where overfishing cannot be eliminated due to the fishing practices of those activities outside of the assessment unit, the FMP or related documentation must include a strategy to eliminate overfishing by the fishermen engaged in the FIP (source: FairTrade USA).
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3. Where stock status reference points are not available and other qualitative status estimates are not provided, assessors can apply the Risked Based Framework (RBF)<sup>9</sup> approach from the MSC, which provides a set of methods for assessing the risk to each of the ecological components from activities associated with the fishery in assessment, to provide a relative estimate of status. This relies on gathering life history and fishing activity information to evaluate the productivity and susceptibility of the fishery. The risk-based approach can be used in evaluation against the following criteria:
- At the  $<20$  level, consider whether the target species is considered a stock of concern (endangered/threatened). According to the criteria source, Seafood Watch, a stock of concern is defined as: Taxa in danger of extinction and whose survival is unlikely if causal factors continue operating. Included are taxa whose numbers have been drastically reduced to a critical level or whose habitats have been so drastically impaired that they are deemed to be in immediate danger of extinction (according to the [FAO Fisheries Glossary](#)). This classification includes taxa listed as “endangered” or “critically endangered” by IUCN or “threatened”, “endangered” or “critically endangered” by an international, national or state government body, as well as taxa listed under CITES Appendix I. This classification does not include species listed by the IUCN as “vulnerable” or “near threatened”.
  - The following definitions for ‘probable’, ‘depleted/overfished’ and ‘limit reference point’ can be applied for criteria under  $20$  and  $40$  scoring levels in evaluation of whether the stock is, or likelihood that the stock is, depleted or overfished (source: Seafood Watch). In evaluation where biomass is unknown and species is

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9. MSC Risk based approach: <https://www.msc.org/for-business/fisheries/developing-world-and-small-scale-fisheries/our-approach-to-data-limited-fisheries>

vulnerable, assessors may conduct a Productivity and Susceptibility Analysis (PSA)<sup>10</sup> (a component of the Risk Based Approach) to determine the vulnerability of the stock.

- i. **Vulnerable:** An IUCN category for listing endangered species. A taxon is considered Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the relevant IUCN criteria.
  - ii. **Probable:** Greater than 50% chance; can be based on quantitative assessment, plausible evidence or expert judgment.
  - iii. **Depleted:** a stock that has been reduced to low abundance or biomass.
  - iv. **Overfished:** a stock is considered overfished when human-induced mortality has reduced the abundance or biomass of a stock below the point where recruitment may be impaired.
  - v. **Limit reference point:** The point where recruitment would be impaired. Reference points need to be evaluated on a case-by-case basis, but in general: Biomass limit reference points (LRPs) should be no less than  $\frac{1}{2} B_{MSY}$  or  $\frac{1}{2}$  an appropriate target reference point such as B<sub>40</sub>%.<sup>11</sup>
- c. Under scoring level 20, where biomass and fishing mortality cannot be calculated numerically. The assessor may rely on qualitative scoring where information may be available to permit evaluation. In these instances, there are no biological reference points set for the stock or biomass estimates (or equivalent) are not publicly available or have not been estimated from stock assessments (source: FishSource). Where applying qualitative information, be sure to include justification and citations, as with all evidence against evaluations.

#### PI 1.1.1A

4. In evaluating the status of low trophic level (LTL) target species, use available information, considering the trophic position of the target stocks to ensure precaution in relation to their ecological role. In particular, for species low in the food chain, this includes maintaining enough biomass to allow the species to fulfill its ecological role (source: Seafood Watch).
  - a. Forage species are the main path for energy to flow from the bottom level of the food web to the higher trophic levels. They feed mainly on plankton and serve as prey to other ocean life; Few species fill this trophic role, but they are the majority of the vertebrate biomass of marine ecosystems; These species retain their crucial role in the food web throughout their lifespan; They tend to have a relatively small body size, early maturity, short life span, and many young.; and Forage species usually form dense schools, making them easy to catch according to the [Lenfest Forage Fish Task Force report](#)). In evaluating reference points for LTL species, the Task Force recommendation is as follows: in fisheries with an intermediate level of information (which will include most well-managed forage fisheries), there must be at least 40% of virgin or unfished biomass ( $B_0$ ) left in the water, and fishing mortality should be no higher than 50% of  $F_{MSY}$ . Low information fisheries should leave at least 80% of  $B_0$  in the water. High information fisheries (which have a high information not just on the fished stock, but the full ecosystem), may exceed these reference points if justified by the science, but in no case should fishing mortality exceed 75% of  $F_{MSY}$  or biomass fall below 30% of  $B_0$ .<sup>12</sup>

10. PSA is a method for assessing the vulnerability of a fishery species or stock when a stock assessment is not available, using a set of predetermined measurable attributes and score rankings. It consists of a semi-quantitative risk assessment that relies on the life history characteristics of a stock (i.e., productivity) and its susceptibility to the fishery in question. Link to the MSC PSA worksheet is available here: <https://www.msc.org/documents/scheme-documents/forms-and-templates/msc-productivity-susceptibility-analysis-worksheet-v1-1>

11. Additional scientific note on LRPS: LRPs below about B<sub>20</sub>% or  $\frac{1}{2} B_{MSY}$  require strong scientific rationale. Limit reference points set at 50% of deterministically calculated  $B_{MSY}$  values below about B<sub>35</sub>% may not be acceptable, as deterministic reference points may not be adequately precautionary accounting for stochasticity and environmental variability.

12. Additional guidance regarding the appropriateness of reference points for forage species can be found on pages 90-91 of Lenfest Forage Fish Task Force guidelines or pages 8-9 of the Lenfest summary document; links [https://www.lenfestocean.org/~media/legacy/Lenfest/PDFs/littlefishbigimpact\\_revised\\_12june12.pdf?la=en](https://www.lenfestocean.org/~media/legacy/Lenfest/PDFs/littlefishbigimpact_revised_12june12.pdf?la=en) and <http://www.oceanconservationscience.org/foragefish/press/Little%20Fish%20Big%20Impact%20Summary.pdf>

### PI 1.2.1

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5. In evaluation of the harvest strategy in place, where one exists:
  - a. At the <20 level, a clear need for management is identified where there is known overfishing on at-risk stocks (as determined under 1.1.1 - overfished, depleted, endangered or threatened), or where there are known negative impacts. For example, there may not be estimates of fishing mortality relative to a sustainable level, however there are clear indications that the stock is in poor health and that the fishery is contributing to the problem; there may be a decline in landings and/or CPUE and known harvest of juveniles (source: Seafood Watch).
  - b. In evaluation at the 20 scoring level, a fishery is a substantial contributor to impacts affecting a population, ecosystem or habitat if the fishery is a main contributor, or one of multiple contributors of a similar magnitude, to cumulative fishing mortality. A fishery is **not** a substantial contributor if the catch of the species is a rare or minor component of the catch in this fishery and the fishery is a small contributor to cumulative mortality, relative to other fisheries, particularly because the fishery operates or is managed in a way that reduces its impact.
  - c. In evaluation at the 40 scoring level, the likelihood of can be identified as a 60% or greater change of 'serious negative impacts on retained populations', based on the status determinations under 1.1.1, indicating that the fishery is more susceptible to impact by activities.

### PI 1.2.2

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6. In evaluation of harvest control rules (HCRs) and tools in place, where any exist, consider whether they are appropriate, and expected to reduce exploitation rates. Using available criteria, consider exploitation rates and outcomes.
  - a. **Harvest control rule:** A rule that describes how harvest is intended to be controlled by management in relation to the state of some indicator of stock status.
  - b. Evaluate whether the stock is not depleted (according to 1.1.1: BCURRENT is above BLIM), and an HCR is in place that specifies a fishing mortality rate (F) to be adopted at fishing mortality limit reference point (FLIM), and divide F to be adopted at BLIM by FMSY or a similar target (source: FishSource).
    - i. A resulting ratio of >2 corresponds to a scoring level of <20.
    - ii. A resulting ratio of >1.5 to 2 corresponds to a scoring level of 20.
    - iii. A resulting ratio of >1 to 1.5 corresponds to a scoring level of 40.
  - c. Under these criteria, consider more simply whether there are no stock assessments available for retained species and measures to restrict fishing effort (input or output based) do not exist (source: Seafood Watch).

### PI 1.2.4

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7. In evaluation of whether there is information available to conduct stock assessments, under this criterion there is no data available to determine the status of a stock. The absence of data can be challenging to identify; the assessor should also consider if data are too old to be reliably considered for management decisions. In some cases, a stock may have been the subject of a stock assessment that was conducted ten or more years ago, which is not representative of the fishery today.

### PI 2.1.1/2.2.1

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8. **Bycatch:** The catch of non-target animals including retained (kept on board and landed) and discarded (dumped

at sea, dead or alive) species. Discarded harvest of undersized, juvenile, or otherwise undesirable individuals of the target species are NOT considered here because these issues are considered by the FishSource scores on target stock health and management. A multispecies fishery has multiple target species. However, profiles in FishSource are generally organized on a single-species or a single-species-group basis. Therefore, for the purposes of FishSource, only the species named in the profile name are considered the target. All other species harvested by the fishery are considered under the bycatch scores.

9. **Main bycatch species:** (a) Any non-ETP species whose catch by the fishery comprises 5% or more by weight of total fishery catch before discarding occurs, or (b) any non-ETP species, regardless of percentage, regularly caught by the fishery that is known to be depleted/overfished or due to life-history traits is likely to be classified as vulnerable to fishery removal (for example long-lived or slow-to-mature stocks like sharks or deep-sea fishes).
10. **Depleted:** a stock that has been reduced to low abundance or biomass, usually considered in relation to a management reference point, if available.
11. **Overfished:** a stock is considered overfished when human-induced mortality has reduced the abundance or biomass of a stock below the point where recruitment may be impaired. This value may often be referred to as  $B_{LIM}$ ,  $\frac{1}{2} B_{MSY}$ ,  $B_{20\%}$  or some other reference point for managed fish stock.
12. **Similar fishery:** Often direct information or data from the fishery and gear are not publicly available for the fishery under examination. Rather than assigning a low score, a similar fishery in the region could provide assistance in scoring in the absence of such fishery-specific information. Examples include Barents Sea and Icelandic capelin, where one fishery is data rich in terms of information while the other has little to no data available. Both operate on the same species using the same gear in adjacent areas (often by the same vessels). It is up to the analyst to decide if a potentially similar fishery is a) close enough geographically to the fishery being scored, b) is targeting the same or very similar species with closely similar habits, c) if they are using the same or closely similar gear, and d) if there any other substantial differences between the fishery to be scored and the similar fishery. Justification for using a similar fishery should be provided in the text sections of the profile.
13. **Jeopardize any main bycatch species:** The impact of the fishery is high. Current bycatch removals or fishing mortality, by this fishery, are or are [highly] likely to be impacting stock status or recruitment.. When reference limits for bycatch indicators have been set, the bycatch indicators are above those limits. A fishery *does not jeopardize the main bycatch species* if the impact of the fishery is low enough that if the species is capable of improving its status, the fishery would not hinder that improvement. It does not require evidence that the status of the species is actually improving.
14. **Substantially impact any main bycatch species:** A fishery substantially impacts main bycatch if; the impact from the fishery alone does not jeopardize any bycatch species but the cumulative level of fishing mortality/removal is impacting stock success AND this fishery is a main contributor, or one of multiple contributors of a similar magnitude, to this cumulative impact. A fishery could substantially impact main bycatch species, but at a level that alone would not jeopardize the main bycatch species.

### PI 2.1.2/2.2.2

15. **Exempt gear (bycatch):** Certain gear types used around the world have been shown to have little or no bycatch associated with them. These include pelagic trawl and seines targeting schooling small pelagics, harpoons, Jig fishing (in many circumstances), hand rakes etc. Chuenpagdee et al 2003, Fuller et al 2008, and the Safina Center Fishing Gear 101 blog series (<https://web.archive.org/web/20190921212459/http://safinacenter.org/category/gear-101/>) are good places to start. Overall a list of gears with known little bycatch are included below:

- Harpoon
- Hand or mechanical jigging (squid, some fish)
- Hand rake
- Diver/hand harvest
- Pelagic purse seine and mid-water trawl (when used in mid water to target schooling small pelagics)
- Others

Note this list is not comprehensive and can be added to as more information is available. Also, some fisheries that appear on this list may have bycatch associated with them. An example is the US NW Atlantic purse and midwater trawl fishery which has incidences of bycatch of haddock, shad, and river herring. Justification for using the scores associated with exempt gears should be provided in the text sections of the profile. Where possible data and analysis from the fishery being analyzed is always preferred.

16. **Appropriate management measures (bycatch):** Measures in place are “likely to work”. Measures for bycatch mitigation can be encapsulated in four possible tactics (Hall, 1996): “(1) increasing the selectivity of the fishery by choices of gear, areas, or seasons; (2) modifying deployment conditions; (3) increasing the fraction released alive either from the gear, or (4) later, from the deck” Bycatch mitigation measures can be broad-based or specific to a fishery, a location, and/or a bycatch species. National or Regional plans that set up a framework for management, without tangible regulation, should not be considered Management Measures (e.g. ESA, MMPA).

### PI 2.1.3/2.2.3

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17. **Some reliable information (bycatch):** Opportunistic data and research that are not part of a monitoring plan for bycatch assessment. Fisher surveys, risk assessments, or other types of qualitative information that yield an incomplete, broad understanding of the annual impact of the bycatch removals of this fishery. The statistical and scientific soundness of extrapolation to the full fishery has not been proven. Generally this information should be less than 10 years old.
18. **Monitoring (bycatch):** Ongoing data collection programs. Can include at-sea observation, portside bycatch studies, mandatory logbook information with high compliance, and repeated population studies on a timeframe consistent with the life-history of the species.
19. **Fishery impact to main bycatch species:** Requires at least subjective knowledge of how bycatch removals from the fishery affect the status of the main bycatch stock(s). These can include estimates of fishing mortality, other measured status indicators (e.g. changes in biomass or CPUE) or more subjective statements from credible sources (for example “fishery is thought to have a low impact on this species”)

### PI 2.3.1

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20. **Jeopardize any ETP species:** The impact of the fishery is high. Current ETP mortality, by this fishery, is or is [highly] likely to be impacting population status or trend.. When reference limits for ETP species have been set, the indicators are above limits. A fishery *does not jeopardize ETP species* if the impact of the fishery is low enough that if the species is capable of improving its status, the fishery would not hinder that improvement. It does not require evidence that the status of the species is actually improving.
21. **ETP species:** Species recognized as endangered, threatened, or protected by national legislation and/or binding international agreements. Species listed under Appendix I of CITES shall be considered ETP species for the purposes of assessment unless it can be shown that the particular population of the CITES-listed species impacted by the fishery under assessment is not ETP. Species listed on the IUCN Red List as vulnerable, endangered, or critically endangered should be considered in the ETP category if the assessment is ten or fewer years old (IUCN, 2017) and relevant to the region in which the fishery occurs.
  - a. **Similar fishery:** Often direct information or data from the fishery and gear are not publicly available for the fishery under examination. Rather than assigning a low score, a similar fishery in the region could provide assistance in scoring in the absence of such fishery-specific information. Examples include Barentsring Ssea and Icelandic capelin, where one fishery is data rich in terms of information while the other has little to no data available. Both operate on the same species using the same gear in adjacent areas (often by the same vessels). It is up to the analyst to decide if a potentially similar fishery is a) close enough geographically to the fishery being scored, b) is targeting the same or very similar species with closely similar habits, c) if they are using the same or closely similar gear, and d) if there any other substantial differences between the fishery to be scored and the similar fishery. Justification for using a similar fishery should be provided in the text sections of the profile.

### PI 2.3.2

22. **Exempt gear (ETP):** Certain gear types used around the world have been shown to have little or no ETP impact associated with them. These include harpoons, Jig fishing (in many circumstances), hand rakes etc. Chuenpagdee et al 2003, Fuller et al 2008, and the Safina Center Fishing Gear 1010 blog series (<https://web.archive.org/web/20190921212459/http://safinacenter.org/category/gear-101/>) are good places to start. Overall a list of gears with no or little interactions are included below:

- Harpoon
- Hand or mechanical jigging (squid, some fish)
- Hand rake
- Diver/hand harvest
- Buoy-less traps or pots
- Others

Note this list is not comprehensive and can be added to as more information is available. Also, some fisheries that appear on this list may still have ETP interactions associated with them. Justification for using the scores associated with Exempt gears should be provided in the text sections of the profile. Where possible data and analysis from the fishery being analyzed is always preferred.

23. **Appropriate Management Measures (ETP):** Measures in place are “likely to work”. Measures for mitigation can be encapsulated in four possible tactics (Hall, 1996): “(1) increasing the selectivity of the fishery by choices of gear, areas, or seasons; (2) modifying deployment conditions; (3) increasing the fraction released alive either from the gear, or (4) later, from the deck”. Mitigation measures can be broad-based or specific to a fishery, a location, and/or an ETP species. National or regional plans that set up a framework for management, without tangible regulation, should not be considered Management Measures (e.g. NPOA Sharks, ESA, MMPA).

### PI 2.3.3

24. **Some reliable information (ETP):** Opportunistic data and research that are not part of a monitoring plan for ETP assessment. Fisher surveys, risk assessments, or other types of qualitative or semi-quantitative information that yield an incomplete, broad understanding of the annual ETP interactions of this fishery. Species may be grouped in reporting. There may be an observer or logbook program in place generating information about interactions, but coverage is low and its statistical and/or its scientific soundness to be extrapolated to the full fishery has not been proven. Generally this information should be less than 10 years old.

25. **Monitoring (ETP):** Ongoing data collection programs. Can include at-sea observation, areal studies, mandatory logbook information with high compliance, and repeated population studies on a timeframe consistent with the life-history of the species.

26. **Impact of the fishery on ETP species:** Requires at least subjective knowledge of how fishery interactions or mortalities affect the status of the ETP stocks. These can include estimates of mortality or total removals related to population size. It can also be more subjective statements from credible sources (for example “fishery is thought to have a low impact on this species”). Note impacts are direct impacts by the fishery (bycatch or entanglements). Trophic interactions (indirect impacts) are to be scored under Ecosystem.

### PI 2.4.1

27. **Best Available Information:** The weight of evidence considering all available information, with the information that is most credible, relevant, unbiased, and based on most recent data weighted most heavily. Peer-reviewed scientific papers and peer-reviewed official government reports are considered to be most credible; NGO and industry reports, fishery-dependent data, and non-peer reviewed scientific or government reports should also be considered but weighted less heavily. Analyses based on the specific fishery in question are considered the most relevant, analyses based on very similar fisheries (i.e. same gear type, same region, etc.) are the second best option, while very general assessments (e.g., global overarching conclusions about a type of gear) are the least relevant, and can still be considered but should be weighted less heavily.



28. **Habitat:** The biophysical and chemical environment, including biogenic structures, where fishing takes place.
29. **Serious or irreversible harm (habitat):** marine habitat loss and destruction. When habitat has been degraded to the point that the marine environment cannot support biodiversity and key species. “Damage or destruction of habitats kills the plants and animals responsible for the habitat’s ecological functions and, in some cases, its survival and regeneration” (Ocean Health Index). The habitat will not be able to provide ecosystem services. Indications of serious or irreversible harm include but are not limited to spreading of dead zones, loss of biodiversity, decreasing abundances of species, habitat fragmentation and decreasing habitat complexity (e.g., Airoldi et al., 2008; Diaz and Rosenberg, 2008; Fahrig, 2003; Hovel and Lipcius, 2001). For a definition of “harm” regarding habitats see BOX 1 below.

**BOX 1. Defining harm (paraphrasing the definition of *adverse effects* on Essential Fish Habitat found in NOAA EFH regulatory guidelines at 50 CFR 600.920)**

Harmful impact “may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and other habitat components, if such modifications reduce the quality and/or quantity of the habitat. Harmful impact may result from actions occurring within the habitat or outside of the habitat and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

30. **Fishery impacts on habitat:** Disruption or damage to the bottom structure that alters/degrades its function. Impacts of the fishery may include:
- *Timing:* When the fishery disrupts a habitat because of seasonal changes in the distribution of fishing effort.
  - *Location:* Where the fishery disrupts a habitat because of the overlap between fishing effort and habitat types that are impacted by the gear used.
  - *Severity:* The magnitude of the fishery’s impact on different habitats, largely depending on the gear, the timing and location of fishing, degree of spatial overlap of the habitat type and the fishery, and gear modifications to avoid or reduce impact.

**PI 2.4.2**

31. **Exempt gear (habitat):** Certain gear types used around the world have been shown to have little or no habitat impact associated with them. These include harpoons, Jig fishing (in many circumstances), hand rakes etc. Chuenpagdee et al 2003, Fuller et al 2008, and the Safina Center Fishing Gear 101 blog series (<http://safinacenter.org/category/gear-101/>) are good places to start. Overall a list of gears with no or little impact are included below:
- Harpoon
  - Hand or mechanical jigging (squid)
  - trolling/green stick gear
  - Purse seine or midwater trawl when used in surface or midwater targeting pelagic fish
  - Diver/hand harvest
  - Others

Note this list is not comprehensive and can be added to as more information is available. Also, some fisheries that appear on this list may still have habitat interactions associated with them. Justification for using the scores associated with Exempt gears should be provided in the text sections of the profile. Where possible data and analysis from the fishery being analyzed is always preferred.

32. **Appropriate (habitat):** Measures in place are “likely to work” and have at least some credible evidence/sources suggesting that they will address the issue.

33. **Management measures (habitat):** Measures can be broad-based or specific to a fishery, a location, and/or a type of habitat. National or Regional plans that set up a framework for management, without tangible regulation, should not be considered Management Measures (e.g. ESA, MMPA). These could include (but are not limited to):
- *Fisheries Restricted Areas (FRAs):* Geographical areas where fishing restrictions apply. They include seasonal closures to fishing and/or prohibiting the use of certain gears.
  - *Marine Protected Areas (MPAs):* “A clearly defined geographical space in the marine environment that is recognized, dedicated, and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (Dudley, 2008).
  - *Modification of gear design or type to reduce impact, e.g., Bering Sea flatfish trawl gear.*

### PI 2.4.3

34. **Some reliable information (habitat):** Opportunistic data and research that are not part of a plan for assessing the impact of fisheries on habitats. Qualitative or semi-quantitative information that yields an incomplete, broad understanding of the timing, location, and severity of the impacts of the fishery also belong to this group. If there is a monitoring program of fishing effort and its spatial and temporal distribution (e.g., VMS and logbook data), the coverage is low (i.e., only a small percentage of vessels have VMS or the VMS poll rate is infrequent) or the data quality has been flagged as low (e.g., VMS data used in coastal fisheries). There is generic knowledge on the impact of the fishing gear type on priority habitats.

### PI 2.5.1

35. **Key elements of ecosystem structure and function:** The features of an ecosystem considered crucial to the ecosystem’s nature and dynamics – its ecological integrity, resilience, and productivity. These can be keystone species, important trophic relationships, energy flows, spatial distribution, or temporal fluctuations of key species, etc.
36. **Serious or irreversible harm (ecosystem):** In reference to impacts of the fishery that threaten the ecological integrity of the ecosystem, the disruption of features crucial to maintaining the ecosystem structure and functionality and that ensure ecosystem resilience and productivity. This includes, but is not limited to, inability to provide ecosystem services, disruption of trophic relationships, and fisheries-induced evolution of life history traits, decrease of biodiversity. When serious or irreversible harm is caused, ecosystem indicators are expected to be below the set limits of ecosystem reference points (ecosystem reference limits).
37. **Fishery’s impacts on the ecosystem:** Requires at least subjective knowledge of how fishery interactions affect the ecosystem. These can include productivity, trophic pyramids, biogeochemical cycles, spatial ecosystem dynamics, community structure and properties, meta-populations and dispersion, evolutionary processes, body-mass vs abundance distribution, interactions across space and time, energy flow mechanisms, etc.

### PI 2.5.2

38. **Appropriate (ecosystem):** Measures in place are “likely to work”.

**Management Measures (ecosystem):** Measures can be broad-based or specific to a fishery, a location, and/or a type of habitat. National or Regional plans that set up a framework for management, without tangible regulation, should not be considered Management Measures (e.g. ESA, MMPA). This may include opportunistic measures that are not part of EBFM, as this is defined below, or measures that deal with specific important ecological problems.

39. **Ecosystem-based fisheries management (EBFM):** Also referred to as ecosystem-based management or ecosystem approach to fisheries management. Among the many possible definitions, here we refer to all frameworks that address the need to manage fisheries in an ecologically sensitive way (Pitzer et al., 2009). These frameworks involve the use of ecosystem indicators based on set goals and targets, the assessment of status and risk, and the development of an adaptive scheme that monitors ecosystem status and sets corrective or precautionary measures. For more information on EBFM and related challenges, also refer to Ruckelshaus et al. (2008)

### PI 2.5.3

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40. **Some reliable information (ecosystem):** Examples include ecosystem or multispecies models that include fisheries impacts. These do not have to be part of a comprehensive ecosystem risk assessment. Information can include expert knowledge and local ecological knowledge from credible sources (for example “fishery is thought to have a low impact”).
41. **Ecosystem:** Features of the environment crucial to maintain the integrity of its structure and function, ensure resilience and productivity (including the ability to deliver ecosystem services), maintain biological diversity of the ecological community, and balance trophic relationships between species.

### PI 3.1.1

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42. **Appropriate and effective legal system:** The assessor should consider documentation on a fisheries management legal system, including at the international level and/or through customary framework. A legal framework is likely to include the existence of a national and/or international framework that appears capable of delivering sustainable fisheries, including through management cooperation where required. As with other criteria, the absence of information and documentation can be challenging to identify (source: FTUSA).

### PI 3.2.1

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43. **Fishery-specific objectives:** Management objectives are A formally established, more or less quantitative target that is actively sought and provides a direction for management action. The assessor should review the Fishery Management Plan (FMP) or related documents to identify whether there are written objectives for the fishery, and whether those objectives account for uncertainty. The FMP should also be precautionary as reviewed by scientific experts, documentation in the FMP or related should provide evidence whether a scientific panel reviews the FMP, and its objectives are deemed precautionary (source: FishSource).

### PI 3.2.2

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44. In evaluation of the fishery management decision making processes, we consider:
- At the <20 scoring level, consider reports of the fishery management authority that may indicate where management decisions are made without clear explanations as to why they are being made. This could also be viewed as the lack of an engaged and transparent process (source: Seafood Watch).
  - At the 20 scoring level, there is no documentation or known process on how user conflicts will be addressed should they arise, or that measures/processes are in place to reduce the likelihood of them arising (source: Seafood Watch).
  - At the 40 scoring level, consider whether the fishery management system is responsive, transparent and has a dispute resolution mechanism. These details should be evident through the process of setting management measures and considering stakeholder input, as described through meeting notices and related announcement and documentation (source: FTUSA).

### PI 3.2.3

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45. In evaluation of compliance, the assessor can consider recent catch records to verify if catches are within set limits or can rely on other known compliance records and information.
- Consider recent catches or landings (depending on which is regulated) to the catch or landing limits in force. At the <20 scoring level: when dividing the catch by the catch limit yields a resulting ratio of >1.5; at the 20 scoring level: when dividing the catch by the catch limit yields a resulting ratio of >1.375 but ≤1.5; and at the 40 scoring level: when dividing the catch by the catch limit yields a resulting ratio of >1.25 but ≤1.375 (source: FishSource).

- b. Alternative to using the catch to catch limit ratio, or where not available, consider whether the scientific body that officially conducts regular stock assessments highlights that the magnitude of IUU fishing is unknown or flags it as a real problem for the stock (source: FishSource).

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- c. Alternatively, there is no known monitoring of the fishery, or monitoring is insufficient such that regulations become ineffective. AND There is no known enforcement of fisheries regulations, or enforcement is insufficient such that regulations become effective. For example, enforcement is inadequate such that individuals below the minimum landing size are regularly landed (source: Seafood Watch).

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## IUU Fishing

- 46. In evaluation of whether illegal, unregulated and unreported (IUU) fishing is taking place:
  - a. In evaluation at the <20 scoring level, there is evidence that more than 25% of the landings from a fishery are from an illegal source, for example, from an illegal gear type, below a minimum landing size, or caught from a restricted area (marine protected area, MPA) (source: Seafood Watch).

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  - b. In evaluation at the 20 scoring level, the management of the fishery is known to not comply with other (non-fishery) legislation, for example endangered species protections, relevant to bycatch species caught in the fishery (source: Seafood Watch).

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  - c. In evaluation at the 40 scoring level, there is an enforcement strategy that exists and may be detailed in the Fishery Management Plan or related documents (source: FTUSA).

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- 47. **Ghost fishing:** The accidental capture of aquatic organisms by fishing gear (usually gill nets, or traps, pots, etc.) that has been lost or discarded into the sea and which continues to entangle or trap aquatic animals. In evaluation of whether the fishery contributes to ghost fishing:
  - a. Certain gears that are considered to have a high likelihood of ghost fishing impacts, for example gillnets, traps and pots, management strategy is not considered sufficient to address these concerns. Guidance is available to assist with determining whether a strategy is sufficient (see the Best Practice Framework developed by the Global Ghost Gear Initiative <https://www.ghostgear.org/resources>) (source: Seafood Watch).

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  - b. Consider whether there are known concerns with ghost fishing from gear lost, and whether there are any measures in place to reduce or mitigate the impact (source: Seafood Watch).

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## APPENDIX B: SCORING DECISION TREES FOR P2

The FishSource scoring method v3.4 uses a dichotomous key approach to determine scoring. The portion of the full FishSource decision trees that correspond to the 0-60 was adapted into tables under section P1 for consistency with P1 and P3. The corresponding “pruned” decision trees are added here as they may be an easier approach for analysts. There are four Principle Issues (PI: Bycatch Main, ETP interactions, Habitat, and Ecosystem)<sup>13</sup>. Each PI has three scoring issues (SI) associated with it (Data, Outcome, and Management).

Step 1: Data and Monitoring

Step 2: Outcome

Step 3: Management

To complete each Step for a PI, the analysis starts with question 1 and moves through the template as directed. For questions with multiple parts, all of the statements have to be true to answer “yes” to that question.

A few things to note

- Red text are final scores for each Step; scoring stops after reaching a red score
- Blue text are phrases which may require additional definitions/guidance and are at the bottom of each Step for a PI.
- Green text indicates the fishery would score >60 on that issue

This document represents the lower scoring branches of the current version as of July 24, 2020 of the FishSource scoring method for environmental impacts, rescaled to score in the 0-60 (rather than FS Scores 0-6) range.

### Bycatch of Main species

#### Step 1: Data and Monitoring (Corresponds to: PI 2.1.3/2.2.3)

1. Is there **some reliable information** for this fishery adequate to at least generally determine **fishery impacts to main bycatch species** encountered OR is the gear as used in the fishery known to have little to no impact to main bycatch species (an “exempt gear”: See Box 1.1)?
  - a. If Yes, **fishery should score >= 60**
  - b. If No go to 2
2. Is there a similar fishery using the same gear type in the same way and targeting the same species in the region which has **some reliable information** on its **fishery impacts to main bycatch species** (See Box 1.2)?
  - a. If Yes go to 3
  - b. If No go to 4
3. Does monitoring in that similar fishery **provide substantial reliable information** on **fishery impacts to main bycatch species**?
  - a. If Yes, **fishery should score >= 60**
  - b. If No go to 4

13. Issues that cut across multiple PIs are scored in each PI. For example; impact to endangered corals would be scored under both Habitat and ETP PIs.

4. Is there some reliable information on the composition of bycatch in this fishery or in the similar fishery?
  - a. If Yes go to 5
  - b. If No **score as a <20**
  
5. Is there some reliable information on the amount of bycatch in this fishery or in the similar fishery?
  - a. If Yes **score as a 40**
  - b. If No **score as a 20**

## Guidance & Definitions

**Bycatch:** The catch of non-target animals including retained (kept on board and landed) and discarded (dumped at sea, dead or alive) species. Discarded harvest of undersized, juvenile, or otherwise undesirable individuals of the target species are NOT considered here because these issues are considered by the FishSource scores on target stock health and management. A multispecies fishery has multiple target species. However, profiles in FishSource are generally organized on a single-species or a single-species-group basis. Therefore, for the purposes of FishSource, only the species named in the profile name are considered the target. All other species harvested by the fishery are considered under the bycatch scores.

**Main bycatch species:** (a) Any non-ETP species whose catch by the fishery comprises 5% or more by weight of total fishery catch before discarding occurs, or (b) any non-ETP species, regardless of percentage, regularly caught by the fishery that is known to be depleted/overfished or due to life-history traits is likely to be classified as vulnerable to fishery removal (for example long-lived or slow-to-mature stocks like sharks or deep-sea fishes).

**Fishery impacts to main bycatch species:** Requires at least subjective knowledge of how bycatch removals from the fishery affect the status of the main bycatch stock(s). These can include estimates of fishing mortality or more subjective statements from credible sources (for example “fishery is thought to have a low impact on this species”)

**Monitoring:** Ongoing data collection programs. Can include at-sea observation, portside bycatch studies, and mandatory logbook information with high compliance, and repeated population studies on a timeframe consistent with the life-history of the species.

**Some reliable information:** Opportunistic data and research that are not part of a monitoring plan for bycatch assessment. Fisher surveys, risk assessments, or other types of qualitative information that yield an incomplete, broad understanding of the annual impact of the bycatch removals of this fishery. The statistical and scientific soundness of extrapolation to the full fishery has not been proven. Generally this information should be less than 10 years old.

**Substantial reliable information:** Information should be collected in the area where the impact occurs and be part of an ongoing monitoring system. The fishery’s annual impact on the main bycatch is known. This information may not be available for the entire fishery but has been extrapolated in a statistically valid way to generate a fishery-wide estimate. Uncertainty is moderate and knowledge gaps are known. Generally this information should be less than 5 years old.

### Step 2: Outcome (Corresponds to PI 2.1.1/2.2.1)

1. Did the fishery score  $\leq 60$  in Step 1 (above)?
  - a. If Yes **Do Not Score Outcome**
  - b. If No go to 2

2. Was the fishery scored in Step 1 (above) based on a similar fishery (See Box 1.2) to the one being examined?
  - a. If Yes go to 7
  - b. If No go to 3
3. Is the gear used in this fishery known to have little to no bycatch associated with it (an “exempt gear”: See Box 1.1) OR does the fishery not have any main bycatch species?
  - a. If Yes **fishery should score  $\geq 60$**
  - b. If No go to 4
4. Are bycatch removals from *this* fishery likely to **jeopardize any main bycatch species**?
  - a. If Yes go to 5
  - b. If No or there are no main bycatch species go to 6
5. Is at least one main bycatch species in the fishery that is likely jeopardized by the fishery also likely to be **depleted or overfished**?
  - a. If Yes then **score as  $<20$**
  - b. If No then **score as a 20**
6. Is it true that the current level of fishing removal from this fishery **substantially impacts any of the main bycatch species**?
  - a. If No **fishery should score  $\geq 60$**
  - b. If Yes **score as a 40**
7. Are bycatch removals from the similar fishery likely to **jeopardize any main bycatch species**?
  - a. If Yes go to 8
  - b. If No or there are no main bycatch species go to 9
8. Is at least one main bycatch species that is likely jeopardized by the similar fishery also likely to be depleted or overfished?.
  - a. If Yes then **score as  $<20$**
  - b. If No then **score as a 20**
9. Is it true that the current level of fishing removal from the similar fishery **substantially impacts any of the main bycatch species**?
  - a. If No **fishery should score  $\geq 60$**
  - b. If Yes **score as a 40**

**Jeopardize any main bycatch species:** The impact of the fishery is high. Current bycatch removals or fishing mortality, by this fishery, are or are [highly] likely to be impacting stock status or recruitment.. When reference limits for bycatch indicators have been set, the bycatch indicators are above the bycatch limits. A fishery *does not jeopardize the main bycatch species if the impact of the fishery is low enough that if the species is capable of improving its status, the fishery would not hinder that improvement. It does not require evidence that the status of the species is actually improving.*

**Substantially impact any main bycatch species:** A fishery substantially impacts main bycatch if; the impact from the fishery alone does not jeopardize any bycatch species but the cumulative level of fishing mortality/removal is impacting stock success AND this fishery is a main contributor, or one of multiple contributors of a similar magnitude, to this cumulative impact. A fishery could substantially impact main bycatch species, but at a level that alone would not jeopardize the main bycatch species.

**Depleted:** a stock that has been reduced to low abundance or biomass, usually considered in relation to a management reference point, if available.

**Overfished:** a stock is considered overfished when human-induced mortality has reduced the abundance or biomass of a stock below the point where recruitment may be impaired. This value may often be referred to as  $B_{LIM}$ ,  $\frac{1}{2} B_{MSY}$ ,  $B_{20\%}$  or some other reference point for managed fish stock.

### Step 3: Management (Corresponds to PI 2.1.2/2.2.2)

1. Is the gear as used in the fishery known to have little to no bycatch associated with it (an “exempt gear”: See Box 1.1) or does the fishery not have main bycatch species associated with it?
  - a. If Yes **fishery should score  $\geq 60$**
  - b. If No go to 2
2. Are there **management measures** in place for the purpose of bycatch mitigation?
  - a. If Yes go to 3
  - b. If No **score as a  $< 20$**
3. Are the measures in place appropriate management measures?
  - a. If Yes go to 4
  - b. If No **score as a  $20$**
4. Is enforcement or compliance with the appropriate management measures problematic?
  - a. If Yes score as a  $40$
  - b. If No **fishery should score  $\geq 60$**

**Appropriate management measures:** Measures in place are “likely to work” and are appropriate to the issue. Measures for bycatch mitigation can be encapsulated in four possible tactics (Hall, 1996): “(1) increasing the selectivity of the fishery by choices of gear, areas, or seasons; (2) modifying deployment conditions; (3) increasing the fraction released alive either from the gear, or (4) later, from the deck” Bycatch mitigation measures can be broad-based or specific to a fishery, a location, and/or a bycatch species. National or regional plans that set up a framework for management, without tangible regulation, should not be considered Management Measures (e.g. ESA, MMPA).



**Box 1.1: Exempt gear**

Certain gear types used around the world have been shown to have little or no bycatch associated with them. These include pelagic trawl and seines targeting schooling small pelagics, harpoons, Jig fishing (in many circumstances), hand rakes etc. Chuenpagdee et al 2003, Fuller et al 2008, and the Safina Center Fishing Gear 101 blog series (<https://web.archive.org/web/20190921212459/http://safinacenter.org/category/gear-101/>) are good places to start. Overall a list of gears with known little bycatch are included below:

- > Harpoon
- > Hand or mechanical jigging (squid)
- > Hand rake
- > Diver/hand harvest
- > Pelagic purse seine and mid-water trawl (when used in mid water to target schooling small pelagics)
- > Others

Note this list is not comprehensive and can be added to as more information is available. Also, some fisheries that appear on this list may have bycatch associated with them. An example is the US NW Atlantic purse and midwater trawl fishery which has incidences of bycatch of haddock, shad, and river herring. Justification for using the scores associated with exempt gears should be provided in the text sections of the profile. Where possible data and analysis from the fishery being analyzed is always preferred.

**Box 1.2: Similar fisheries.**

Often direct information or data from the fishery and gear are not publicly available for the fishery under examination. Rather than assigning a low score, a similar fishery in the region could provide assistance in scoring in the absence of such fishery-specific information. Examples include Barents Sea and Icelandic capelin, where one fishery is data rich in terms of information while the other has little to no data available. Both operate on the same species using the same gear in adjacent areas (often by the same vessels). It is up to the analyst to decide if a potentially similar fishery is a) close enough geographically to the fishery being scored, b) is targeting the same or very similar species with closely similar habits, c) if they are using the same or closely similar gear, and d) if there any other substantial differences between the fishery to be scored and the similar fishery. Justification for using a similar fishery should be provided in the text sections of the profile.

**ETP interactions****Step 1: Data and monitoring (Corresponds to: PI 2.3.3)**

1. Is there **some reliable information** for this fishery adequate to at least generally determine **fishery impacts to ETP species** encountered OR Is the gear as used in the fishery known to have little to no impact on ETP (an “exempt gear”: See Box 2.1)?
  - a. If Yes **fishery should score  $\geq 60$**
  - b. If No go to 2
2. Is there a similar fishery using the same gear type in the same way and targeting the same species in the region which has data on its fishery impacts to ETP species (See Box 2.2)?
  - a. If Yes go to 3
  - b. If No go to 5

3. Does monitoring in that similar fishery **provide substantial reliable information on fishery impacts to ETP species?**
  - a. If Yes **fishery should score  $\geq 60$**
  - b. If No go to 4
4. Is there **some reliable information** on the composition of ETP bycatch in the fishery or similar fishery?
  - a. If Yes go to 5.
  - b. If No **score as a  $<20$**
5. Is there **some reliable information** on the amount of ETP bycatch in the fishery or similar fishery?
  - a. If Yes **score as a  $40$**
  - b. If No **score as a  $20$**

**ETP species:** Species recognized as endangered, threatened, or protected by national legislation and/or binding international agreements. Species listed under Appendix I of CITES shall be considered ETP species for the purposes of assessment unless it can be shown that the particular population of the CITES-listed species impacted by the fishery under assessment is not ETP. Species listed on the IUCN Red List as vulnerable, endangered, or critically endangered should be considered in the ETP category if the assessment is ten or fewer years old (IUCN, 2017) and relevant to the region in which the fishery occurs.

**Monitoring:** Ongoing data collection programs. Can include at-sea observation, areal studies, and mandatory logbook information with high compliance, and repeated population studies on a timeframe consistent with the life-history of the species.

**Some reliable information:** Opportunistic data and research that are not part of a monitoring plan for ETP assessment. Fisher surveys, risk assessments, or other types of qualitative or semi-quantitative information that yield an incomplete, broad understanding of the annual ETP interactions of this fishery. Species may be grouped in reporting. There may be an observer or logbook program in place generating information about interactions, but coverage is low and its statistical and scientific soundness to be extrapolated to the full fishery has not been proven. Generally this information should be less than 10 years old.

**Substantial reliable information:** Information should be collected in the area where the impact occurs and be part of a monitoring system. The fishery's annual interactions with ETP species ("types") are known, including cases where some species are reported as a group. This information may not be available for the entire fishery but has been extrapolated in a statistically valid way to generate a fishery-wide estimate. If an observer or logbook program is in place, coverage is reasonable, i.e., its statistical and scientific soundness have been proven. The uncertainty of estimates and knowledge gaps are known. Generally this information should be less than 5 years old.

**Impact of the fishery on ETP species:** Requires at least subjective knowledge of how fishery interactions or mortalities affect the status of the ETP stocks. These can include estimates of mortality or total removals related to population size. It can also be more subjective statements from credible sources (for example "fishery is thought to have a low impact on this species"). Note, impact are direct impacts by the fishery (bycatch or entanglements). Trophic interactions are to be scored under Ecosystem.

**Step 2: Outcome (Corresponds to PI 2.3.1)**

1. Did the fishery score a  $\leq 60$  in Step 1 (above)?
  - a. If Yes **Do Not Score Outcome**
  - b. If No go to 2
2. Was the fishery scored in Step 1 (above) based on a similar fishery (See Box 2.2) to the one being examined?
  - a. If Yes go to 5
  - b. If No go to 3
3. Is the gear as used in this fishery known to have little to no interactions with any ETP species (an “exempt gear”: See Box 2.1) or is the fishery known to not have impacts to ETP species?
  - a. If Yes **fishery should score  $\geq 60$**
  - b. If No go to 4
4. Are ETP interactions from *this* fishery likely to **jeopardize any ETP species**?
  - a. If Yes **score as  $< 60$**
  - b. If No **fishery should score  $\geq 60$**
5. Is the gear as used in the similar fishery known to have little to no interactions with any ETP species (an “exempt gear”: See Box 2.1)?
  - a. If Yes **fishery should score  $\geq 60$**
  - b. If No go to 6
6. Do ETP interactions from the similar fishery jeopardize any ETP species?
  - a. If Yes or unknown **score as  $< 60$**
  - b. If No **fishery should score  $\geq 60$**

**Jeopardize any ETP species:** The impact of the fishery is high. Current ETP mortality, by this fishery, is or is [highly] likely to be impacting population status or trend. When reference limits for ETP species have been set, the indicators are above limits. A fishery *does not jeopardize ETP species if the impact of the fishery is low enough that if the species is capable of improving its status, the fishery would not hinder that improvement. It does not require evidence that the status of the species is actually improving.*

**Step 3: Management (Corresponds to PI 2.3.2)**

1. Is the gear as used in the fishery known to have little to no ETP interactions (an “exempt gear”: See Box 2.1) or does the fishery not have ETP interactions?
  - a. If Yes **fishery should score  $\geq 60$**
  - b. If No go to 2
2. Are there **management measures** in place to mitigate or reduce ETP interactions ?
  - a. If Yes go to 3
  - b. If No **score as a  $< 20$**
3. Are the measures in place **appropriate management measures**?
  - a. If Yes go to 4
  - b. If No **score as a  $20$**
4. Is enforcement or compliance with the **appropriate management measures** problematic?
  - a. If Yes **score as a  $40$**
  - b. If No **fishery should score  $\geq 60$**

**Appropriate Management Measures:** Measures in place are “likely to work” and appropriate to the issue. Measures for mitigation can be encapsulated in four possible tactics (Hall, 1996): “(1) increasing the selectivity of the fishery by choices of gear, areas, or seasons; (2) modifying deployment conditions; (3) increasing the fraction released alive either from the gear, or (4) later, from the deck”. Mitigation measures can be broad-based or specific to a fishery, a location, and/or an ETP species. National or regional plans that set up a framework for management, without tangible regulation, should not be considered Management Measures (e.g. NPOA Sharks, ESA, MMPA).

**Box 2.1: Exempt gear**

Certain gear types used around the world have been shown to have little or no ETP species impact associated with them. These include harpoons, jig fishing (in many circumstances), hand rakes etc. Chuenpagdee et al 2003, Fuller et al 2008, and the Safina Center Fishing Gear 101 blog series(<https://web.archive.org/web/20190921212459/http://safinacenter.org/category/gear-101/>) are good places to start. Overall a list of gears with no or little interactions are included below:

- > Harpoon
- > Hand or mechanical jigging (squid, some fish)
- > Hand rake
- > Diver/hand harvest
- > Buoy-less traps or pots
- > Others

Note this list is not comprehensive and can be added to as more information is available. Also, some fisheries that appear on this list may still have ETP interactions associated with them. Justification for using the scores associated with

Exempt gears should be provided in the text sections of the profile. Where possible data and analysis from the fishery being analyzed is always preferred.

### Box 2.2: Similar fisheries.

Often direct information or data from the fishery and gear are not publicly available for the fishery under examination. Rather than assigning a low score, a similar fishery in the region could provide assistance in scoring in the absence of such fishery-specific information. Examples include Barents Sea and Icelandic capelin, where one fishery is data rich in terms of information while the other has little to no data available. Both operate on the same species using the same gear in adjacent areas (often by the same vessels). It is up to the analyst to decide if a potentially similar fishery is a) close enough geographically to the fishery being scored, b) is targeting the same or very similar species with closely similar habits, c) if they are using the same or closely similar gear, and d) if there are any other substantial differences between the fishery to be scored and the similar fishery. Justification for using a similar fishery should be provided in the text sections of the profile.

## Habitat

### Step 1: Data and Monitoring (Corresponds to: PI 2.4.3)

1. Is there some reliable information for this fishery to at least generally characterize fishery impacts on habitat OR is the gear as used in the fishery known to have little to no impact on habitat (an “exempt gear”: See Box 3.1)?
  - a. If Yes **fishery should score  $\geq 60$**
  - b. If No **score as a  $<60$**

**Habitat:** The biophysical and chemical environment, including biogenic or physical structures, necessary for reproduction, growth, feeding, and shelter. It does not include forage or food source use which is handled under Ecosystem..

Some reliable information: Opportunistic data and research that are not part of a plan for assessing the impact of fisheries on habitats. Qualitative or semi-quantitative information that yields an incomplete, broad understanding of the timing, location, and severity of the impacts of the fishery also belong to this group. If there is a monitoring program of fishing effort and its spatial and temporal distribution (e.g., VMS and logbook data), the coverage is low (i.e., only a small percentage of vessels have VMS or the VMS poll rate is infrequent) or the data quality has been flagged as low (e.g., VMS data used in coastal fisheries). There is generic knowledge on the impact of the fishing gear type on priority habitats.

**Fishery impacts on habitat:** Disruption or damage to the bottom structure that alters/degrades its function. Impacts of the fishery include:

- Timing: When the fishery disrupts a habitat because of seasonal changes in the distribution of fishing effort.
- Location: Where the fishery disrupts a habitat because of the overlap between fishing effort and habitat types that are impacted by the gear used.
- Severity: The magnitude of the fishery’s impact on different habitats, largely depending on the gear, the timing and location of fishing, degree of spatial overlap of the habitat type and the fishery, and gear modifications to avoid or reduce impact.

### Step 2: Outcome (Corresponds to PI 2.4.1)

1. Did the fishery score  $\leq 60$  in Step 1 (above)?
  - a. If Yes **Do Not Score Outcome**
  - b. If No go to 2

2. Is the gear as used in the fishery known to have little to no impact on habitat (an “exempt gear”: See Box 3.1)?
  - a. If Yes **fishery should score  $\geq 60$**
  - b. If No go to 3
  
3. Does the **Best Available Information** suggest the fishery *currently* reduces structure and function of habitats within the footprint of the fishery to a point where it causes **serious or irreversible harm**?
  - a. If Yes **score as a  $<20$**
  - b. If No go to 4
  
4. Does the **Best Available Information** suggest that *in the future* the fishery is likely to reduce structure and function of habitats within the footprint of the fishery to a point where there would be **serious or irreversible harm**?
  - a. If Yes **score as a  $20$**
  - b. If No **fishery should score  $\geq 60$**

**Best Available Information:** The weight of evidence considering all available information, with the information that is most credible, relevant, unbiased, and based on the most recent data weighted most heavily. Peer-reviewed scientific papers and peer-reviewed official government reports are considered to be most credible; NGO and industry reports, fishery-dependent data, and non-peer reviewed scientific or government reports should also be considered but weighted less heavily. Analyses based on the specific fishery in question are considered the most relevant, analyses based on very similar fisheries (i.e. same gear type, same region, etc.) are the second best option, while very general assessments (e.g., global overarching conclusions about a type of gear) are the least relevant, and can still be considered but should be weighted less heavily.

**Serious or irreversible harm:** marine habitat loss and destruction. When habitat has been degraded to the point that the marine environment cannot support biodiversity and key species. “Damage or destruction of habitats kills the plants and animals responsible for the habitat’s ecological functions and, in some cases, its survival and regeneration” ([Ocean Health Index](#)). The habitat will not be able to provide ecosystem services. Indications of serious or irreversible harm include but are not limited to spreading of dead zones, loss of biodiversity, decreasing abundances of species, habitat fragmentation and decreasing habitat complexity (e.g., Airoldi et al., 2008; Diaz and Rosenberg, 2008; Fahrig, 2003; Hovel and Lipcius, 2001). For a definition of “harm” regarding habitats see BOX 2.

**BOX 2. Defining harm (paraphrasing the definition of adverse effects on Essential Fish Habitat found in NOAA EFH regulatory guidelines at 50 CFR 600.920)**

Harmful impact “may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and other habitat components, if such modifications reduce the quality and/or quantity of the habitat. Harmful impact may result from actions occurring within the habitat or outside of the habitat and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

**Step 3: Management (Corresponds to PI 2.4.2)**

1. Is the gear as used in the fishery known to have little or no habitat interactions (an “exempt gear”: See Box 3.1) OR does the fishery have only minimal interactions?
  - a. If Yes fishery should score  $\geq 60$
  - b. If No go to 2

2. Are there **management measures** in place to mitigate or reduce habitat interactions?
  - a. If Yes go to 3
  - b. If No **score as a <20**
  
3. Are the **management measures** in place to mitigate or reduce habitat interactions appropriate?
  - a. If Yes go to 4
  - b. If No **score as a 20**
  
4. Is enforcement or compliance with the **appropriate management measures** problematic?
  - a. If **Yes score as a 40**
  - b. If No **fishery should score >= 60**

**Management Measures:** Measures can be broad-based or specific to a fishery, a location, and/or a type of habitat. National or regional plans that set up a framework for management, without tangible regulation, should not be considered Management Measures (e.g. ESA, MMPA). These could include (but are not limited to):

- Fisheries Restricted Areas (FRAs): Geographical areas where fishing restrictions apply. They include seasonal closures to fishing and/or prohibiting the use of certain gears.
- Marine Protected Areas (MPAs): “A clearly defined geographical space in the marine environment that is recognized, dedicated, and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (Dudley, 2008).
- Modification of gear design or type to reduce impact, e.g., Bering Sea flatfish trawl gear.

**Appropriate:** Measures in place are “likely to work” and have at least some credible evidence/sources suggesting that they will address the issue.

### Box 3.1: Exempt gear

Certain gear types used around the world have been shown to have little or no habitat impact associated with them. These include harpoons, jig fishing (in many circumstances), hand rakes etc. Chuenpagdee et al 2003, Fuller et al 2008, and the Safina Center Fishing Gear 1010 blog series (<https://web.archive.org/web/20190921212459/http://safinacenter.org/category/gear-101/>) are good places to start. Overall a list of gears with no or little impact are included below:

- Harpoon
- Hand or mechanical jigging (squid)
- trolling/green stick gear
- Purse seine or Midwater trawl when used in surface or midwater when targeting pelagic fish
- Diver/hand harvest
- Others

Note this list is not comprehensive and can be added to as more information is available. Also, some fisheries that appear on this list may still have habitat interactions associated with them. Justification for using the scores associated with Exempt gears should be provided in the text sections of the profile. Where possible data and analysis from the fishery being analyzed is always preferred.

## Ecosystem

### Step 1: Data and Monitoring (Corresponds to: PI 2.5.3)

1. Is there some reliable information for this fishery to at least generally characterize the ecosystem and the **fishery's impacts on the ecosystem**?
  - a. If No **score as <60**
  - b. If Yes **fishery should score  $\geq 60$**

**Ecosystem:** Features of the environment crucial to maintain the integrity of its structure and function, ensure resilience and productivity (including the ability to deliver ecosystem services), maintain biological diversity of the ecological community, and balance trophic relationships between species.

**Monitoring:** Ongoing data collection programs. Can include fishery independent or dependent surveys, trophic studies/modeling, etc.

**Fishery's impacts on the ecosystem:** Requires at least subjective knowledge of how fishery interactions affect the ecosystem. These can include productivity, trophic pyramids, biogeochemical cycles, spatial ecosystem dynamics, community structure and properties, meta-populations and dispersion, evolutionary processes, body-mass vs abundance distribution, interactions across space and time, energy flow mechanisms, etc.

**Some reliable information:** Examples include ecosystem or multispecies models that include fisheries impacts. These do not have to be part of a comprehensive ecosystem risk assessment. Information can include expert knowledge and local ecological knowledge from credible sources (for example "fishery is thought to have a low impact").

### Step 2: Outcome (Corresponds to PI 2.5.1)

2. Did the fishery score  $\leq 60$  in Step 1 (above)?
  - a. If Yes **Do Not Score Outcome**
  - b. If No go to 2
3. Does the **Best Available Information** suggest the *fishery* currently disrupts key elements of ecosystem structure and function to a point that serious or irreversible harm occurs?
  - a. If Yes **score as a <20**
  - b. If No go to 3
4. Does the **Best Available Information** suggest that *in the future* the fishery is likely to impact ecosystems to the point of serious or irreversible harm?
  - a. If Yes **score as a 20**
  - b. If No **fishery should score  $\geq 60$**

**Best Available Information:** The weight of evidence considering all available information, with the information that is most credible, relevant, unbiased, and based on the most recent data weighted most heavily. Peer-reviewed scientific papers and peer-reviewed official government reports are considered to be most credible; NGO and industry reports, fishery-dependent data, and non-peer reviewed scientific or government reports should also be considered but



weighted less heavily. Analyses based on the specific fishery in question are considered the most relevant, analyses based on very similar fisheries (i.e. same gear type, same region, etc.) are the second best option, while very general assessments (e.g., global overarching conclusions about a type of gear) are the least relevant, and can still be considered but should be weighted less heavily.

**Key elements of ecosystem structure and function:** The features of an ecosystem considered crucial to the ecosystem's nature and dynamics – its ecological integrity, resilience, and productivity. These can be keystone species, important trophic relationships, energy flows, spatial distribution, or temporal fluctuations of key species, etc.

**Serious or irreversible harm:** In reference to impacts of the fishery that threaten the ecological integrity of the ecosystem, the disruption of features crucial to maintaining the ecosystem structure and functionality and that ensure ecosystem resilience and productivity. This includes, but is not limited to, inability to provide ecosystem services, disruption of trophic relationships, and fisheries-induced evolution of life history traits, decrease of biodiversity. When serious or irreversible harm is caused, ecosystem indicators are expected to be below the set limits of ecosystem reference points (ecosystem reference limits).

### Step 3: Management (Corresponds to PI 2.5.2)

1. Are there **management measures** in place to manage the impacts of the fishery on the ecosystem?
  - a. If Yes go to 2
  - b. If No **score as a <20**
2. Are the measures above **appropriate**?
  - a. If Yes go to 3
  - b. If No **score as a 20**
3. Is enforcement or compliance with the appropriate management measures problematic?
  - a. If Yes **score as a 40**
  - b. If No **fishery should score >= 60**

**Appropriate Management Measures:** Measures in place are “likely to work”. Measures can be broad-based or specific to a fishery, a location, and/or a type of habitat. National or Regional plans that set up a framework for management, without tangible regulation, should not be considered Management Measures (e.g. ESA, MMPA). This may include opportunistic measures that are not part of EBFM, as this is defined below, or measures that deal with specific important ecological problems.

**Ecosystem-based fisheries management (EBFM):** Also referred to as ecosystem-based management or ecosystem approach to fisheries management. Among the many possible definitions, here we refer to all frameworks that address the need to manage fisheries in an ecologically sensitive way (Pitzer et al., 2009). These frameworks involve the use of ecosystem indicators based on set goals and targets, the assessment of status and risk, and the development of an adaptive scheme that monitors ecosystem status and sets corrective or precautionary measures. For more information on EBFM and related challenges, also refer to Ruckelshaus et al. (2008)