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Ecuador Mahi Fishery Improvement Project
Scoping Document

Prepared for

WWF and MSC

Prepared by

MRAG Americas, Inc.

October 2009

Contents

1 Introduction

Following the completion of a recent evaluation of the Ecuador mahi mahi fishery using the Risk-based Framework (RBF) of the Fishery Assessment Methodology (FAM v2), a number of Performance Indicators (PIs) were scored such that the fishery would be likely to either fail under a full MSC assessment (score below 60), or pass with conditions (score between 60 and 80).

The main purpose of this document is to identify and prioritise the PI categories under each of three MSC principals such that relevant tasks, or actions, may be developed as part of a Fishery Improvement Project (FIP). The objectives of the FIP would be to ensure a more sustainable fishery and increase the likelihood of passing a full MSC assessment, either with or without conditions.

A fishery likely to fail one or more performance indicator (score < 60) has two options for passing certification: make improvements to the fishery to reach the conditional pass level (score $\geq$ 60 but < 80); or make improvement to the fishery to score $\geq$ 80. The MSC requires closing out conditions within the 5-year certification period. The decision will likely depend on such things as amount of work and time to reach a conditional pass compared with that to reach an unconditional pass. For example, data necessary to perform a stock assessment may take several years to collect, but preliminary studies within the FIP may be sufficient to obtain a conditional pass until more information is available within the 5 year re-assessment period.

The following summary table provides general information about each PI that might cause the fishery to either fail (High Priority) or pass with conditions (Medium Priority) (see Table 1). In addition, the likely timeframe for the completion of tasks associated with each PI has been highlighted, although these may be subject to change according to the target set (e.g. pass assessment without conditions or with some conditions).

This scoping document is designed to assist in the planning phase of a FIP and provides an example of the likely range of activities or steps that may be considered to reach one or more the MSC scoring guideposts (SG). These have been outlined in the following set of tables to demonstrate what outcome(s) or information is required to prevent a fail (below SG60), a conditional pass (between SG60 and SG80) or pass (above SG80).

Table 1: Summary information for Performance Indicators highlighted within the MSC Pre-assessment to be either a high (below SG60) or medium priority (between SG60 and SG80).

Component	PI No.	Performance Indicator Category	Priority	Timeframe	Linkages
Principle 1: Sustainability of exploited stocks					
Outcome	1.1.1	Stock Status	**High**	Medium/Long	1.1.2; 1.2.1; 1.2.4
	1.1.2	Reference Points	**High**	Medium	1.1.1; 1.2.1; 1.2.4
	1.1.3	Stock Rebuilding	**-**	-	1.1.1; 1.1.2; 1.2.1; 1.2.4
Management	1.2.1	Harvest Strategy	**High**	Medium	1.1.1; 1.1.2; 1.2.2; 1.2.4
	1.2.2	Harvest Control Rules and Tools	**High**	Medium	1.1.1; 1.1.2; 1.2.1; 1.2.3; 1.2.4; 3.1.1; 3.2.3
	1.2.3	Information and monitoring	**Medium**	Medium	1.1.2; 1.2.1; 1.2.2; 1.2.4
	1.2.4	Assessment of Stock Status	**High**	Medium	1.1.1; 1.1.2; 1.2.2; 1.2.3
Principle 2: The impact of the fishery on the marine environment					
Retained Species	2.1.1	Status	**Low**	-	2.1.2; 2.1.3
	2.1.2	Management Strategy	**Low**	-	2.1.1; 2.1.3
	2.1.3	Information and Monitoring	**Low**	-	2.1.2; 3.1.1
Bycatch	2.2.1	Status	**Low**	-	2.2.2; 2.2.3
	2.2.2	Management strategy	**Low**	-	2.2.1; 2.2.3
	2.2.3	Information and Monitoring	**Medium**	Medium	2.2.2; 3.1.1
ETP species	2.3.1	Status	**Medium**	Medium	2.3.2; 2.3.3
	2.3.2	Management Strategy	**Medium**	Medium	2.3.1; 2.3.3
	2.3.3	Information and Monitoring	**Medium**	Medium	2.3.2; 3.1.1
Habitat	2.4.1	Status	**Low**	-	2.4.2; 2.4.3; 3.2.5
	2.4.2	Management Strategy	**Low**	-	2.4.1; 2.4.3; 3.1.1; 3.2.3
	2.4.3	Information and Monitoring	**Low**	-	2.4.1; 2.4.2; 2.5.1; 3.1.1
Ecosystem	2.5.1	Status	**Low**	-	2.5.2; 2.5.3; 3.2.5
	2.5.2	Management Strategy	**Medium**	Medium	2.5.1; 2.5.3; 3.1.1; 3.2.3
	2.5.3	Information and Monitoring	**Medium**	Medium	2.5.1; 2.5.2; 3.1.1
Principle 3: The fishery management system					
Governance and Policy	3.1.1	Legal/Customary Framework	National - **Low**	-	1.2.2; 2.1.3; 2.2.3; 2.3.3; 2.4.2; 2.4.3; 2.5.2; 2.5.3
			International - **High**	Medium-long	
	3.1.2	Consultation, Roles and Responsibilities	National - **Low**	-	3.2.2
			International - **High**	Medium-long	
	3.1.3	Long Term Objectives	National - **Low**	-	2.4.2; 3.2.4
			International - **High**	Medium-long	
	3.1.4	Incentives for Sustainable Fishing	**Low**	-	3.2.5
Fishery Specific Management	3.2.1	Fishery Specific Objectives	**Medium**	Short	3.1.3; 3.2.4; 3.2.5
	3.2.2	Decision Making Processes	**High**	Medium	3.1.2

System	3.2.3	Compliance and Enforcement	**High**	Medium	1.2.2; 3.1.1; 3.1.2; 3.2.1
	3.2.4	Research Plan	**Medium**	Medium	3.1.3; 3.2.1
	3.2.5	Management Performance Evaluation	**Medium**	Medium	1.1.1; 2.1.1; 2.2.1; 2.3.1; 2.4.1; 2.5.1; 3.1.4; 3.2.1

2 Key MSC Performance Indicators to inform FIP

This section provides more detail of each PI likely to cause concern within three major MSC Principles and indicates the current status of the fishery against one or more of the MSC scoring guideposts at 60 and 80. If the fishery is likely to fail a full assessment based on the PI score, it is given a High Priority, whereas a fishery that might pass with conditions is given a Medium Priority. A short description of the type of information and/or research that might help the fishery attain the standard necessary to reach one or more scoring guidepost is also given to assist in developing a Fishery Improvement Project.

2.1 Principle 1

2.1.1 Stock status

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="5">1.1.1
Stock status</td><td rowspan="5">The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.</td><td colspan="2">The current status of the mahi stock remains unknown in relation to limit reference points or proxy values. Within the past 12 months, a significant amount of new information has been collected on the biological characteristics and fishing operations of the Ecuador fleet (MAGAP and SRP 2009)

Without further information a risk based approach has been adopted. The results of a level 1 SICA analysis have shown the fishery would score between 60 and 80 (medium priority).</td><td>High</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>It is likely that the stock is above the point where recruitment would be impaired.</td><td>It is highly likely that the stock is above the point where recruitment would be impaired.

The stock is at or fluctuating around its target reference point.</td><td></td></tr>
<tr><td colspan="3">Comment: Since the stock status did not score 80 or above using the risk based framework (RBF), the fishery would not be eligible to use the RBF again in subsequent assessments (paragraph 6.2.14 & 6.2.15, MSC 2009). At reassessment, the stock status shall then be scored using the scoring guideposts present in the Fisheries Assessment Methodology (FAM) default assessment tree. Although the current assessment would score this PI as a medium priority, since this is likely to fail the fishery during the next reassessment it has been re-categorized as a high priority. A plan of action is necessary to demonstrate how this additional quantitative information will be collected to determine the status of the stock.

In addition, an important pre-requisite for scoring 60 and above is to develop precautionary reference points (see below). Estimates of current stock biomass and fishing mortality could be available through the development of an appropriate stock assessment and the results compared with target and limit reference points. In the absence of these data, proxy values may be sufficient to reach SG60 level. Lower levels of uncertainty about the status of stock biomass and fishing mortality will increase confidence in the results.</td><td></td></tr>
</table>

2.1.2 Reference Points

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">1.1.2
Reference points</td><td rowspan="4">Limit and target reference points are appropriate for the stock.</td><td colspan="2">To date no precautionary reference points are available for this fishery. Since performance indicator 1.1.1 (stock status) was scored under the risk based framework, scoring of performance indicator 1.1.2 (reference points) automatically gets assigned a score of 80 in accordance with paragraph 6.2.37 of the FAM (MSC 2009).</td><td>High</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.</td><td colspan="2">Reference points are appropriate for the stock and can be estimated.

The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.</td></tr>
<tr><td colspan="3">Comment: Since the stock status did not score 80 or above using the RBF, the fishery would not be eligible to use the RBF again in subsequent assessments (paragraph 6.2.14 & 6.2.15, MSC 2009). As such this performance indicator remains a high priority since it would no longer be scored automatically. Sufficient information should be collected in order to develop reference points. This could be developed as part of a national fisheries management plan, or preferably conducted by an RFMO such as IATTC.

In the absence of robust biological reference points that can be used to determine the status of the fishery in terms of stock biomass and fishing mortality, precautionary proxy values such as minimum tail length against length at maturity (i.e. Lm_{100}) and basic CPUE trends may be sufficient to reach SG60 level.</td></tr>
</table>

2.1.3 Performance of the harvest strategy

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">1.2.1 Performance of the harvest strategy</td><td rowspan="4">There is a robust and precautionary harvest strategy in place.</td><td colspan="2">Ecuador does not currently have a formal harvest strategy in place for the mahi fishery. However, the management system has implemented a number of programs, including a minimum size, VMS, voluntary logbooks (with plans for a mandatory logbook), routine port sampling, outreach to fishermen on the importance of adhering to minimum size limits, and research to evaluate a gear modifications. Ecuador is currently developing an Action Plan for the mahi fishery, similar to the Shark Action plan that will help to formalize the current management strategy for mahi.

However, a comprehensive harvest strategy responsive to the state of the stock that reflects the target and limit reference points will be difficult to develop until the reference points are addressed.</td><td>High</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.

The harvest strategy is likely to work based on prior experience or plausible argument.

Monitoring is in place that is expected to determine whether the harvest strategy is working.</td><td>The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.

The harvest strategy may not have been fully tested but monitoring is in place and evidence exists that it is achieving its objectives.</td><td></td></tr>
<tr><td colspan="3">Comment: The results of a stock assessment will help establish whether current ‘informal’ management strategies are effective at maintaining the stock at sustainable levels. Based on the results of these findings, alternative management action(s) may be required. Further assessments of the stock should be undertaken in a timely manner to continue monitoring the performance of the strategy.

Additional information, monitoring and control of catches within international waters and other countries could be developed as part of a bilateral agreement or party to an RFMO such as IATTC.</td><td></td></tr>
</table>

2.1.4 Harvest control rules (HCRs) and tools

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">1.2.2 Harvest control rules (HCRs) and tools</td><td rowspan="4">There are well defined and effective harvest control rules in place</td><td colspan="2">While it is recognized that the minimum landing size may be appropriate to reduce the risk of recruitment overfishing, there are no clear guidelines on the rules or what action would be taken if the status of the stock was shown to be reduced to unsustainable levels (e.g. reduce fishing season length, reduce number of vessels, TAC etc.). Preliminary scientific information now helps to demonstrate that the minimum landing size (80 cm) is above the length of maturity and, if appropriately enforced, may be effective in controlling exploitation (MAGAP and SRP 2009). However, minimum landing size has not yet been recognized as part of a formal harvest strategy. The development and implementation of the mahi Action Plan will help resolve this issue.

To date however, no fishery-specific harvest control rules exist to describe management action in response to changes in the fishery and/or changes in stock status in relation to reference points.</td><td>High</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>Generally understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.

There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.</td><td>Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.

The selection of the harvest control rules takes into account the main uncertainties.

Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</td><td></td></tr>
<tr><td colspan="3">Comment: Given available information on the status of the stock in relation to biological reference points, HCRs can be developed which describes what management actions will occur in response to changes in the fishery. HCRs do not have to specify monotonically declining levels of fishing mortality with declining stock biomass. Instead, periodic reductions in fishing mortality such as closed areas and/or seasons may serve an equal purpose. These rules should be developed in a transparent manner and ideally, tested to ensure they are robust to uncertainties in the reported data. The development and implementation of a mahi action plan will help address this issue. However, it remains unclear how this issue can be implemented within international waters without bilateral agreements or party to an RFMO such as IATTC.</td></tr>
</table>

2.1.5 Harvest strategy: Information / monitoring

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">1.2.3 Harvest strategy: Information / monitoring</td><td rowspan="4">Relevant information is collected to support the harvest strategy</td><td colspan="2">Within the past 12 months, a significant amount of new information has been collected on the biological characteristics and fishing operations of the Ecuador fleet (MAGAP and SRP 2009). This preliminary scientific information will serve as a baseline from which to support a fisheries management harvest strategy. To date, the geographic distribution and stock structure of the mahi population is not fully understood, although it is believed to encompass a wide area within the Eastern Pacific Ocean, extending south of the equator through both Ecuador and Peru. Scientific information is now being collected to help understand the stock productivity, and preliminary results are available on seasonal length frequencies, maturity, growth, natural mortality, sex ratio and fecundity. The current vessel licensing scheme is capable of providing information on the Ecuador mahi fleet composition while a complete census of all fishers' catch has been implemented since October 2008 in several key landing ports in Ecuador This monitors approximately 80% of all removals from the mahi fishery. Further information on discards and by-catch may soon be available through adaptation of the current shark documentation scheme. There are very few mahi-mahi discards, and all sizes are utilized.</td><td>Medium</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.

Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.</td><td>Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.

Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.

There is good information on all other fishery removals from the stock.</td><td></td></tr>
<tr><td colspan="3">Comment: It is important to determine the boundaries of the stock and how vulnerable it is to exploitation within both international and domestic waters. A regional monitoring program is best implemented by an RFMO such as IATTC. Additional information on genetic structure and tagging experiments can provide useful information on stock distribution and abundance. The ongoing national data collection program in Ecuador will provide valuable information on the national fleet, although international agreements would be</td><td></td></tr>
</table>

		required between fishing nations to share stock-wide information. Again, this data can be collected through IATTC, for example. *Fisheries-independent surveys may also be considered as a valuable tool to obtain unbiased data for stock assessment purposes. It would be important to evaluate the results of each stock assessment to ensure the objectives of the harvest strategy are being achieved.*

2.1.6 Assessment of stock status

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">1.2.4 Assessment of stock status</td><td rowspan="4">There is an adequate assessment of the stock</td><td colspan="2">There has been no recent assessment of the stock of mahi off Ecuador and Peru. A Virtual Population Analysis (VPA) carried out during the early 1990s in Ecuador (Patterson and Martinez 1991) was undertaken at a time when the fishery was considerably different and on the basis of limited sampling.</td><td>High</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>The assessment estimates stock status relative to reference points.

The major sources of uncertainty are identified.</td><td colspan="2">The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points.

The assessment takes uncertainty into account.

The stock assessment is subject to peer review.</td></tr>
<tr><td colspan="3">Comment: Since the stock status was scored using the RBF, the assessment of stock status was automatically scored 80 (paragraph 6.3.22, MSC 2009). However, because the stock status did not score 80 or above using the RBF, the fishery would not be eligible to use the RBF again in subsequent assessments (paragraph 6.2.14 & 6.2.15, MSC 2009). As such this performance indicator remains a high priority since it would no longer be scored automatically in future reassessments. Sufficient information should be collected in order to develop an assessment of the stock. This may be part of a national fisheries management plan, or conducted by an RFMO such as IATTC.

A strategy could be developed to provide a preliminary assessment of the stock based first on data-limited information, but then leading to more sophisticated data-rich models as more information becomes available from the fisheries monitoring program. A review of the data requirements necessary to develop and run stock assessment models would indicate what additional information is required from the fishery and/or research. An assessment of the stock can be made using fisheries-dependent and/ or fisheries independent data. Increased credibility of the results would be generated if the stock assessment methodology and results were later subject to external review. Alternatively, the assessment framework and data pre-requisites could be developed and implemented by an RFMO such as IATTC.</td></tr>
</table>

2.2 Principle 2

2.2.1 Retained species: outcome status

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.1.1
Outcome
Status</td><td rowspan="4">The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.</td><td colspan="2">There are no main retained species in the Ecuador mahi mahi fishery. Landing records show that sharks are the primary retained species, but make up approximately 1% of the aggregate catch by number</td><td>Low</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.

If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.</td><td colspan="2">Main retained species are <u>highly likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.</td></tr>
<tr><td colspan="3">Comment: No action required.</td></tr>
</table>

2.2.2 Retained species: management strategy

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td>2.1.2 Management strategy</td><td>There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.</td><td colspan="2">The country produced a National Plan of Action on Sharks (NPOA-S) in 2006, following FAO’s Code of Conduct guidelines. The Plan includes activities and strategies at short, medium, and long terms. All of the billfishes, and some of the shark species, are under the jurisdiction of the IATTC, and with the adoption of the new Antigua Convention, more species will fall in this category. The IATTC produces stock assessments and recommendations for the management of these stocks. Resolutions can be found at the website of IATTC www.iattc.org, and they include limits on the amount of longline effort in the eastern Pacific, requests to release alive individuals not to be retained, a ban on finning, etc. The National Park Galapagos is part of a national strategy to deal with pelagic species such as those involved in this fishery, and acts as a reserve for many of the stocks considered, since an area defined by a distance of 40 miles to all the islands is out of bounds for fishing. A plan for building capacity among scientists and technicians is in place. SRP has implemented the policy, with effective monitoring of catches.</td><td>Low</td></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><th>SG60</th><th>SG80</th><td rowspan="3"></td></tr>
<tr><td>There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.

The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).</td><td>There is a partial strategy in place, if necessary that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.

There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.

There is some evidence that the partial strategy is being implemented successfully.</td></tr>
<tr><td colspan="3">Comment: No action required.</td></tr>
</table>

2.2.3 Retained species: information / monitoring

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td>2.1.3
Information / monitoring</td><td>Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.</td><td colspan="2">The monitoring of landings covers more than 80% of the numbers landed, giving a very good idea of the characteristics, and volumes of the catch. The monitoring program has started recently, as a result of the NPOA-S, so there is not a long time series available. The monitoring program is designed to account for 100% of the shark landings in key port; with continuity and the current level of sampling effort the program should produce a very adequate monitoring basis. The improvement of the quality of the data collected is the first step in a strategy to manage the resources. Besides the numbers, the program collects biological data on target, and retained species, that can be useful to track the changes in biological indices such as size distributions, sex ratios, age at first maturity, etc., to be used to assess the condition of the stocks. An observer program currently run by WWF with support from several organizations has gathered data on all retained species since 2004, but its level of coverage has been decreasing in recent years, and it is too low to produce reliable estimates.</td><td>Low</td></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td>SG60</td><td>SG80</td><td rowspan="3"></td></tr>
<tr><td>Qualitative information is available on the amount of main retained species taken by the fishery.

(Information is adequate to qualitatively assess outcome status with respect to biologically based limits.)

Information is adequate to support measures to manage main retained species.</td><td>Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.

(Information is sufficient to estimate outcome status with respect to biologically based limits.)

Information is adequate to support a partial strategy to manage main retained species.

Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</td></tr>
<tr><td colspan="2">Comment: No action required.</td></tr>
</table>

Note: Scoring issues in brackets need not be scored when the RBF is used to score PI 2.1.1.

2.2.4 Bycatch species: outcome status

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.2.1
Bycatch species: outcome status</td><td rowspan="4">The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.</td><td colspan="2">There are no main bycatch species. The vast majority of the individuals captured are retained, so discarded species are very limited in numbers. Observer coverage demonstrates that pelagic rays are the most common discard from the fishery. They are released alive, but some damage to bucal parts may result in delayed mortality. The population appears to be very large, and the mortality is probably not significant. The fishery is highly unlikely to hinder recovery of rays if the stock status should decline from other pressures.</td><td>Low</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>Main bycatch species are <u>likely</u> to be within biologically based limits, or if outside such limits there are mitigation <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding.

If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.</td><td>Main bycatch species are <u>highly likely</u> to be within biologically based limits or if outside such limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> mitigation measures in place such that the fishery does not hinder recovery and rebuilding.</td><td></td></tr>
<tr><td colspan="3">Comment: No action required.</td><td></td></tr>
</table>

2.2.5 Bycatch species: management strategy

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.2.2
Bycatch species: management strategy</td><td rowspan="4">There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations.</td><td colspan="2">As there are no main bycatch species, no management strategy required in this case to reach a score of 80. The bycatch strategy consists of observer coverage that monitors the total catch and discards.</td><td>Low</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>There are <u>measures</u> in place, if necessary, which are expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.

The measures are considered <u>likely</u> to work, based on plausible argument (e.g general experience, theory or comparison with similar fisheries/species).</td><td colspan="2">There is a <u>partial strategy</u> in place, if necessary, for managing bycatch that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.

There is <u>some objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or the species involved.

There is <u>some evidence</u> that the partial strategy is being implemented successfully.</td></tr>
<tr><td colspan="3">Comment: No action required.</td></tr>
</table>

2.2.6 Bycatch species: information / monitoring

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.2.3
Bycatch species: information / monitoring</td><td rowspan="4">Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.</td><td colspan="2">There are some observer data from the period 2004 to 2008, but observer coverage has been declining, so the ability to determine the level and significance of the bycatch mortality is been seriously limited.</td><td>Medium</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>Qualitative information is available on the amount of main bycatch species affected by the fishery.

(Information is adequate to broadly understand outcome status with respect to biologically based limits.)

Information is adequate to support measures to manage bycatch.</td><td>Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery.

(Information is sufficient to estimate outcome status with respect to biologically based limits.)

Information is adequate to support a partial strategy to manage main bycatch species.

Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</td><td></td></tr>
<tr><td colspan="2">Comment: An observer program with reasonable spatial and temporal coverage is needed for long term monitoring. SRP has implemented an observer program, with plans to expand it and make it mandatory, as described in section 1.2.1.</td><td></td></tr>
</table>

Note: Scoring issues in brackets need not be scored when the RBF is used to score PI 2.2.1.

2.2.7 ETP species: Outcome status

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.3.1
ETP species: information / monitoring</td><td rowspan="4">The fishery meets national and international requirements for protection of ETP species.

The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.</td><td colspan="2">Observer data and knowledge of the fishery operations determine that the fishery does not interact with seabirds or marine mammals. Observer data indicate a high potential for survival of hooked or entangled sea turtles. The impact on the sea turtles seems low given current information. The mortality estimates for turtles are based on assumptions about fishers:
(a) not retaining the turtles for consumption or other purposes,
(b) not killing the turtles to recover their hooks
(c) releasing them dehooked, or with the hook left with only a short segment of line. Ecuador complies with applicable sea turtle treaties.</td><td>Medium</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>Known effects of the fishery are <u>likely</u> to be within limits of national and international requirements for protection of ETP species.

Known direct effects are <u>unlikely</u> to create <u>unacceptable impacts</u> to ETP species.</td><td>The effects of the fishery are known and are <u>highly likely</u> to be within limits of national and international requirements for protection of ETP species.

Direct effects are <u>highly unlikely</u> to create <u>unacceptable impacts</u> to ETP species.

Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.</td><td></td></tr>
<tr><td colspan="3">Comment: Confirmation that fishers comply with regulations and confirmation that the low observed mortality of sea turtles applies over a wider spatial scale would meet the requirements of this performance indicator.</td><td></td></tr>
</table>

2.2.8 ETP species: management strategy

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.3.2
ETP species: information / monitoring</td><td rowspan="4">The fishery has in place precautionary management strategies designed to:
- meet national and international requirements;
- ensure the fishery does not pose a risk of serious or irreversible harm to ETP species;
- ensure the fishery does not hinder recovery of ETP species; and
- minimise mortality of ETP species.</td><td colspan="2">Ecuador has implemented a law, management measures, and research to reduce impacts on sea turtles, including a regulatory ban on retention. The creation of the Galapagos Marine Reserve acts as a reserve for the beach nesting of black turtles. Port sampling of landed catch acts as a deterrent to retention. Ecuador conducts research on suitable gear, SRP has developed a training and capacity building program for fishermen to emphasize the need for protection of sea turtles. SRP supports the work of partner organizations for research that facilitates release of sea turtles.</td><td>Medium</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>There are <u>measures</u> in place that minimise mortality, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.

The measures are <u>considered likely</u> to work, based on <u>plausible argument</u> (e.g., general experience, theory or comparison with similar fisheries/species).</td><td>There is a <u>strategy</u> in place for managing the fishery’s impact on ETP species, including measures to minimise mortality, that is designed to be highly likely to achieve national and international requirements for the protection of ETP species.

There is an <u>objective basis for confidence</u> that the strategy will work, based on <u>information</u> directly about the fishery and/or the species involved.

There is <u>evidence</u> that the strategy is being implemented successfully.</td><td></td></tr>
<tr><td colspan="3">Comment: While a number of measures have been developed, not all are implemented. Confirmation of successful implementation is required.</td></tr>
</table>

2.2.9 ETP species: information / monitoring

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.3.3
ETP species: information / monitoring</td><td rowspan="4">Relevant information is collected to support the management of fishery impacts on ETP species, including:
- information for the development the management strategy;
- information to assess the effectiveness of the management strategy; and
- information to determine the outcome status of ETP species.</td><td colspan="2">Ecuador has supported the observer program run by WWF and other organizations (IATTC, etc.) since 2004, and it is currently launching an observer program of its own to monitor the fishery. The WWF observer program has operated with a reduced effort in this fishery, and the data gathered for the last 2 fishing seasons is clearly inadequate to evaluate the bycatch.

The trends in the populations impacted are being monitored in some cases with different levels of frequency (waved albatross nesting population, and black turtle nesting population from the Galapagos Islands), but for other species, the nesting areas are in other countries. In some cases there is good information available (e.g. sea turtles nesting in Costa Rica or Mexico). In the most recent seasons, the data do not allow to produce a reliable estimate of the bycatch rates. Effort data on the other hand, have improved significantly in quality over the last year.</td><td>Medium</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>Information is <u>adequate</u> to <u>broadly understand</u> the impact of the fishery on ETP species.

Information is adequate to support <u>measures</u> to manage the impacts on ETP species

<u>Information</u> is sufficient to <u>qualitatively</u> estimate the fishery related mortality of ETP species.</td><td>Information is <u>sufficient</u> to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a <u>full strategy</u> to manage impacts.

<u>Sufficient data</u> are available to allow fishery related mortality and the impact of fishing to be <u>quantitatively</u> estimated for ETP species.</td><td></td></tr>
<tr><td colspan="3">Comment: Sufficient monitoring of the sea turtle interactions to allow robust estimates of mortality and documentation that the mortality does not cause risk to or impede recovery of the sea turtle stocks is required. While seabirds do not appear to interact with the fishing gear, more widespread coverage of the fishery could confirm this.</td></tr>
</table>

2.2.10 Habitat: Status

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.4
Habitat:
Status</td><td rowspan="4">The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.</td><td colspan="2">The pelagic longline gear does not interact with the bottom, and has no direct impact while fishing. Lost gear occurs rarely, as fishermen stay close to the line, so indirect impacts from lost gear on the bottom are negligible.</td><td>Low</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>The fishery is <u>unlikely</u> to reduce habitat structure and function to a point where there would be serious or irreversible harm.</td><td colspan="2">The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</td></tr>
<tr><td colspan="3">Comment: No action required.</td></tr>
</table>

2.2.11 Habitat: Management strategy

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.4.2 Habitat: Management strategy</td><td rowspan="4">There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.</td><td colspan="2">NO strategy required at the 80 level</td><td>Low</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>There are <u>measures</u> in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.

The measures are considered <u>likely</u> to work, based on plausible argument (e.g general experience, theory or comparison with similar fisheries/habitats).</td><td colspan="2">There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.

There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved.

There is some evidence that the partial strategy is being implemented successfully.</td></tr>
<tr><td colspan="3">Comment: No strategy required at 80 level.</td></tr>
</table>

2.2.12 Habitat: Information / monitoring

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.4.3
Habitat: Information / monitoring</td><td rowspan="4">Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.</td><td colspan="2">It is well known that the gear remains in the near-surface waters – which are not sensitive or vulnerable to the gear – and that well tended longline gear will not impact sensitive bottom habitats. The spatial distribution of mahi mahi is such that bottom tending gear is not appropriate for harvesting.</td><td>Low</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>There is a basic understanding of the types and distribution of main habitats in the area of the fishery.

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</td><td colspan="2">The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.

Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear.

Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</td></tr>
<tr><td colspan="3">Comment: No action required at 80 level.</td></tr>
</table>

2.2.13 Ecosystem: Status

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.5.1 Ecosystem: Status</td><td rowspan="4">The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.</td><td colspan="2">The fishery has no issues for concern for retained catch, bycatch, habitat, or TEP species with the possible exception of sea turtles. Observer data show a very high potential survival rate for sea turtles, although illegal retention could cause mortality. Given the low impacts for these components, the likely impact of the fishery on the ecosystem also seems low. Because no specific information was available for ecosystem structure and trophic relationships, a SICA was conducted.</td><td>Low</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>n/a</td><td colspan="2">The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.</td></tr>
<tr><td colspan="3">Comment: The need to use SICA resulted from a lack of information on ecosystem structure and trophic relationships.</td></tr>
</table>

2.2.14 Ecosystem: Management strategy

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.5.2 Ecosystem: Management strategy</td><td rowspan="4">There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function</td><td colspan="2">The fishery has no explicit strategy for managing impacts of the fishery on the ecosystem as a whole; however, strategies exist for the most-vulnerable components. Sharks are rarely caught in the mahi mahi fishery, but retained catch falls under the requirements of the national plan of action. SRP has developed a strategy for protecting sea turtles that seems likely to succeed. However, the plan is only partially implemented.</td><td>Medium</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>There are <u>measures</u> in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.

The measures are considered likely to work, based on <u>plausible argument</u> (eg, general experience, theory or comparison with similar fisheries/ ecosystems).</td><td>There is a partial strategy in place, if necessary, that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.

The partial strategy is considered likely to work, based on plausible argument (eg, general experience, theory or comparison with similar fisheries/ ecosystems).

There is some evidence that the measures comprising the partial strategy are being implemented successfully.</td><td></td></tr>
<tr><td colspan="3">Comment: Information that can be obtained on the potential impacts of fishing activities on the ecosystem structure and function will help determine whether current management strategies are effective at maintaining ecosystem structure and function. Explicitly incorporating a management strategy in the mahi mahi management plan could satisfy this requirement.</td><td></td></tr>
</table>

2.2.15 Ecosystem: Information / monitoring

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">2.5.3 Ecosystem: Information / monitoring</td><td rowspan="4">There is adequate knowledge of the impacts of the fishery on the ecosystem.</td><td colspan="2">Sufficient information exists to identify the main functions of the components of the ecosystem, but not for the key elements (trophic structure and function, community composition, productivity pattern and biodiversity). As a result, a SICA was conducted to provide information about the ecosystem. The mahi mahi fishery is considered highly targeted but with possible impacts sea turtles. Existing data collection programs should be sufficient to determine changes in targeting behavior.</td><td>Medium</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>Information is adequate to <u>identify</u> the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).

Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but <u>have not been investigated in detail</u>.</td><td>Information is adequate to broadly understand the functions of the key elements of the ecosystem.

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

The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.

Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.

Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</td><td></td></tr>
<tr><td colspan="3">Comment: To date little or no information exists to gauge the level of impacts of the fishery on the key elements of the ecosystem. A literature review and trophic models could highlight the potential impacts of the mahi mahi fishery on key elements of ecosystem structure and function. This coupled with the results from other activities (e.g. stock assessment, total retained species, ETP, bycatch etc), could support the results of the SICA.</td><td></td></tr>
</table>

2.3 Principle 3

2.3.1 Governance and Policy: Legal and/or customary framework

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">3.1.1 Governance and Policy: Legal and/or customary framework</td><td rowspan="4">The management system exists within an appropriate and effective legal and/or customary framework that:

- Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 & 2,

- Observes the legal rights created explicitly or by custom of people dependent on fishing for food and livelihood, and

- Incorporates an appropriate dispute resolution framework.</td><td colspan="2">There is a legal framework in place in Ecuador with fisheries regulations that can be used to manage the fishery and promote sustainable utilization of the resource. However, the current fishery law is outdated, and a new law is in process that is expected to increase the fishery management capabilities. Without an updated fishery law, this performance indicator would have a reduced score. The mechanism for resolution of legal disputes seems well understood, but is not laid out explicitly. No effective international management system currently exists, so the minimum requirements of SG60 are not met.</td><td>National – low

International - high</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.

The management system incorporates or is subject by law to a <u>mechanism</u> for the resolution of legal disputes arising within the system.

Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.

The management system has a mechanism to <u>generally respect</u> 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.</td><td>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.

The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.

The management system or fishery is attempting to comply in a timely fashion with binding judicial decisions arising from any legal challenges.

The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</td><td></td></tr>
<tr><td colspan="3">Comment: While this PI passes at the 80 level for the national fishery, higher scores would result with an explicit mechanism for the resolution of legal disputes, and a demonstration that stakeholders consider the mechanism as effective. The current score is contingent on passing the updated fishery law.

The newly passed Antigua Convention offers an opportunity to bring mahi mahi under the IATTC umbrella. Using the IATTC process to develop an international management system for mahi mahi is the most straight forward way of implementing best practices in international waters. Alternatively and less effectively, bilateral and multilateral agreements to perform these functions would be necessary.</td><td></td></tr>
</table>

2.3.2 Governance and Policy: Consultation, roles and responsibilities

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">3.1.2 Governance and Policy: Consultation, roles and responsibilities</td><td rowspan="4">The management system has effective consultation processes that are open to interested and affected parties.

The roles and responsibilities of organizations and individuals who are involved in the management process are clear and understood by all relevant parties.</td><td colspan="2">The consultation process with key stakeholders is ad-hoc, provides little or no formal procedures, but appears effective. SRP and industry agree that an open communication exists. The industry can bring issues and information to the SRP, and the SRP conducts meetings and workshops for the coastal fishing communities. The roles are well established.

The ad hoc nature of the bilateral consultations of Ecuador and Peru is not sufficiently robust to assure effective bi-lateral consultation and decision making. The mahi mahi stock likely ranges beyond Ecuador and Peru, and no international system exists for consultation.</td><td>National – low

International - high</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>generally understood</u>.

The management system includes consultation processes that <u>obtain relevant information</u> from the main affected parties, including local knowledge, to inform the management system.</td><td>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.

The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge.

The management system demonstrates consideration of the information obtained. The consultation process provides opportunity for all interested and affected parties to be involved.</td><td></td></tr>
<tr><td colspan="3">Comment: The newly passed Antigua Convention offers an opportunity to bring mahi mahi under the IATTC umbrella. Using the IATTC process to develop an international management system for mahi mahi is the most straight forward way of implementing an effective consultation for fishermen in international waters.</td><td></td></tr>
</table>

2.3.3 Governance and Policy: Long term objectives

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">3.1.3 Governance and Policy: Long term objectives</td><td rowspan="4">The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.</td><td colspan="2">Ecuador has clear, explicit, long-term objectives consistent with the MSC Principles and Criteria.

No long-term objectives exist for the international waters and appear insufficient for neighboring countries.</td><td>National – low

International - high</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>Long-term objectives to guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>implicit</u> within management policy.</td><td>Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within management policy.</td><td></td></tr>
<tr><td colspan="3">Comment: The long term objectives, currently in the shark NPOA, will occur in the mahi mahi management plan when it is completed

The newly passed Antigua Convention offers an opportunity to bring mahi mahi under the IATTC umbrella. Using the IATTC process to develop an international management system for mahi mahi is the most straight forward way of implementing clear, explicit, long-term objectives for fishermen in international waters.</td></tr>
</table>

2.3.4 Governance and Policy: Incentives for sustainable fishing

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">3.1.4 Governance and Policy: Incentives for sustainable fishing</td><td rowspan="4">The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.</td><td colspan="2">The Ecuador government provides fuel for fishing vessels at lower than market prices, but does not provide other incentives that would contribute to unsustainable fishing. Communications, planning, and participation of fishers reduce information gaps and gain support of fishermen for government management.</td><td>Low</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.</td><td colspan="2">The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that negative incentives do not arise.</td></tr>
<tr><td colspan="4">Comment: An explicit review of mechanisms to provide positive incentives and actions to implement improvements would strengthen performance of this performance indicator.

International policies for providing positive incentives and avoiding negative incentives seem much weaker.</td></tr>
</table>

2.3.5 Fishery specific management system: Fishery-specific objectives

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">3.2.1
Fishery specific management system: Fishery-specific objectives</td><td rowspan="4">The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2.</td><td colspan="2">The Ecuador fishery has implicit but not explicit fishery-specific objectives. For example, the subsecretariat of fisheries has stated an intent for sustainability of the mahi resource. Communications with industry leaders shows intent to support fishing communities within the context of sustainability. Recent work in cooperation with WWF and other partners demonstrated recognition of the need to understand interactions with ETP species and protection of these species.</td><td rowspan="2">Medium</td></tr>
<tr><td>SG60</td><td>SG80</td></tr>
<tr><td><u>Objectives</u>, which are broadly consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are <u>implicit</u> within the fishery’s management system.</td><td>Short and long term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery’s management system.</td></tr>
<tr><td colspan="3">Comment: A management plan under preparation is expected to make the objectives explicit.</td></tr>
</table>

2.3.6 Fishery specific management system: Decision-making processes

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">3.2.2 Fishery specific management system: Decision-making processes</td><td rowspan="4">The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives.</td><td colspan="2">A mechanism for effective decision making process exists in the Ecuador management system. However, this mechanism is underutilized, which has led to politically, rather than scientifically-based decisions – in part because scientific background and advice was inadequate.</td><td>High</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>There are <u>informal</u> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.

Decision-making processes respond to <u>serious issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take <u>some</u> account of the wider implications of decisions.</td><td colspan="2">There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.

Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.

Decision-making processes use the precautionary approach and are based on best available information.

Explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</td></tr>
<tr><td colspan="3">Comment: A review of the current institutional arrangements and decision-making processes within the fishery-specific management system would help identify key gaps that might require further attention. Utilizing the Consejo Nacional de Desarrollo Pesquero in transparent decision making procedures, specifying best available information, proactive addressing of concerns, the precautionary approach, and providing for explanations of decisions, would satisfy this requirement. Demonstrating stability in the management system would help satisfy this requirement.</td></tr>
</table>

2.3.7 Fishery specific management system: Compliance and enforcement

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="5">3.2.3 Fishery specific management system: Compliance and enforcement</td><td rowspan="5">Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.</td><td colspan="2">Some aspects of MCS are evident, but the MCS system is inadequate overall. In the past, the enforcement system was known as ineffective but is improving. SRP inspectors do not have enforcement authority although they could report infractions to the SRP administration; the Navy, which has enforcement authority, does not regularly participate in fisheries enforcement. The minimum size limit is enforced inconsistently, and undersized mahi mahi are landed and trucked to Peru for marketing. Sanctions are not effectively or consistently reported and applied, in part because SRP inspectors work to build relationships with fishermen, who could withhold data or otherwise make inspectors jobs more difficult.</td><td>High</td></tr>
<tr><td>SG60</td><td>SG80</td><td></td></tr>
<tr><td>Monitoring, control and surveillance <u>mechanisms</u> exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.

Sanctions to deal with non-compliance exist and there is some evidence that they are applied.

Fishers are <u>generally thought</u> to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.</td><td>A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.

Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.

Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.

There is no evidence of systematic non-compliance.</td><td></td></tr>
<tr><td colspan="3">Comment: The trajectory of improvements over the past year or two in observer coverage and port monitors will likely result in higher scores in the future. However, active involvement by enforcement agents is necessary to comply with the requirements of this performance indicator.</td><td></td></tr>
</table>

2.3.8 Fishery specific management system: Research plan

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">3.2.4 Fishery specific management system: Research plan</td><td rowspan="4">The fishery has a research plan that addresses the information needs of management.</td><td colspan="2">SRP has undertaken research it needs for management and has produce reports from this research. SRP, in consultation with WWF, has produced a research plan to guide development of research projects. The Plan describes objectives and a general approach, but is not strategic with action steps and designation of responsibilities. As research results are only recently becoming available for mahi mahi, it is not yet clear how widely and timely the results will be distributed.</td><td>Medium</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td><u>Research</u> is undertaken, as required, to achieve the objectives consistent with MSC’s Principles 1 and 2.

Research results are <u>available</u> to interested parties.</td><td colspan="2">A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC’s Principles 1 and 2.

Research results are disseminated to all interested parties in a timely fashion.</td></tr>
<tr><td colspan="3">Comment: Based on the short- and long-term objectives of the fishery, a more detailed research plan could be developed with a list of priorities to demonstrate how research will help address, amongst others, issues of stock status and ecosystem impacts. This will help to identify key areas of existing and new research and development, consistent with the objectives of the MSCs Principles 1 and 2. The results of current research could be made available and disseminated to all interested parties through participation at regional workshops or via the internet, for example.</td></tr>
</table>

2.3.9 Fishery specific management system: Monitoring and evaluation

<table>
<tr><th>PI Category</th><th>PI</th><th colspan="2">Status</th><th>Priority</th></tr>
<tr><td rowspan="4">3.9
Fishery specific management system: Monitoring and evaluation</td><td rowspan="4">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</td><td colspan="2">The SRP evaluation of the management system is internal and ad hoc, but an improvement over previous administrations. Plans to put in place new fishery regulations, the improvements in fishery monitoring, and the research MOU demonstrate that internal review has taken place and resulted in management changes.</td><td>Medium</td></tr>
<tr><td>SG60</td><td colspan="2">SG80</td></tr>
<tr><td>The fishery has in place mechanisms to evaluate some parts of the management system and is subject to occasional internal review.</td><td colspan="2">The fishery has in place mechanisms to evaluate key parts of the management system and is subject to regular internal and occasional external review.</td></tr>
<tr><td colspan="3">Comment: Completion of the mahi mahi management plan, currently in preparation, will provide a basis for evaluation whether the management system achieves the objectives of the plan. Continued improvement in monitoring of the fishery would increase the level of information available to evaluate the performance of the fishery-specific management system against its limited objectives (to be revised). A plan for regular internal review of the mahi mahi management system by SRP, perhaps in collaboration with INP, and periodic ministerial review would meet the requirements.</td></tr>
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