

SCORING INDICATORS		FINDINGS
Principle 1		A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.
1.1	<i>(MSC Criterion 1)</i>	The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s)
1.1.1		There is sufficient information on the target species and stock separation to allow the effects of the fishery on the stock to be evaluated
1.1.1.1		<i>Is adequate knowledge of the identity of the target species?</i>
60	The target species is unlikely to be confused by fishers and scientists with any other species	
80	The target species is cannot be confused with any other species by fishers and scientists, and is almost never misidentified.	
100	There is comprehensive knowledge of the taxonomy of the species. The target species cannot be confused with any other species by fishers and scientists, and is never misidentified.	
1.1.1.2		<i>Is there adequate knowledge of the stock structure of the species?</i>
60	Sufficient data are available to determine whether multiple stocks are being fished. Monitoring programmes are designed to collect data for each stock.	
80	Appropriate methods have been applied to samples collected from the primary areas in which the species is found and used to delineate stocks.	
100	A variety of state-of-the-art techniques have been applied to identify sub-structuring of subpopulations.	
1.1.1.3		<i>Is there adequate knowledge of the geographical range of the target species?</i>
60	The ranges of the stocks have been delineated. Information on ontogenetic and seasonal patterns of movement is available and is sufficient to determine general movement paths and major spawning grounds.	
80	The ranges of the stocks have been delineated reliably. Information on ontogenetic and seasonal patterns of movement/availability is available based on data from fishers and fishery-independent research surveys. Sufficient sampling has been conducted to be confident that all major spawning grounds have been identified.	

100	A variety of techniques, including tagging and inferences from fishery-dependent and -independent data, have been applied to determine the ranges of the stocks and their ontogenetic and seasonal patterns of movement / availability. Sufficient sampling has been conducted to be confident that all spawning grounds have been identified.	
1.1.1.4		<i>Is the life history of the species understood?</i>
60	Estimates of natural mortality and growth rates are available for the species. Age validation has been achieved using indirect methods. The reproductive biology of the species is sufficiently well known to support the population model.	
80	Reliable estimates of natural mortality, and growth rates are available for all fished stocks. The method used for age determination has been validated for the ages that make up the bulk of the catch.	
100	Comprehensive information is available on reproductive biology, natural mortality, diet and growth rates for all fished stocks based on fishery-dependent and fishery-independent samples. There is knowledge of changes over time in biological parameters. The method used for age determination has been validated for most ages. Information is available on age-reading error and is accounted for in assessments. Indices of recruitment are available and included in stock assessments.	
1.1.2		There is adequate knowledge of the fishery and its removals of the species
1.1.2.1		<i>Is there adequate knowledge of the effort and gear used in the fishery?</i>
60	Total annual effort by fishing method is known. Gear selectivity is taken into account when stock assessments are conducted.	
80	Total annual effort by fishing method is known and reported for major spatial zones of the fishery. Data is available on gear selectivity and changes over time in fishing technology and practices, and is supported by current research.	
100	Comprehensive records are kept on fishing effort. The data collected allow quantification of the amount of fishing effort at small spatial scales. Stock assessments monitor changes in the distribution of fishing effort. Research programmes and in-situ observations have studied fishing practices, gear selectivity and the key determinants of catchability, including environmental influences and changes over time in fishing technology and practices.	
1.1.2.2		<i>Are all sources of fishing mortality are measured and accounted for?</i>

60	Estimates of total catches, including discard rates, are available, and are included in stock assessments.	
80	All sources of catches, including by-catches and discards, of the species are quantified and included in stock assessments. Account is taken in assessments of catches from areas in which stocks are mixed. Independent estimates of discard rates are available.	
100	All sources of human-induced removals, including by-catches and discards, are quantified by stock and included in stock assessments. The primary source of estimates of catches is a statistically-designed observer programme.	
1.1.2.3		<i>Are the age- and size-structures of the catch measured?</i>
60	Estimates of the age-/size-structure of the catches by the major fisheries are available for a range of years. Some data are available on the sex-structure of the catch.	
80	Reliable estimates of the age-, sex- and size-composition of the catches are available for major fishery sectors and fishing areas over several years. The precision of these estimates is understood and accounted for in stock assessments.	
100	Comprehensive data are available on the landings and discards by all fisheries. The age-, size-, and sex-structure of the catch can be estimated accurately and precisely for all stocks and fishing areas. Annual data on the age-/size-structure of any discards are available based on an observer programme. The sampling scheme used to collect the data on age and size was deigned to achieve adequate coverage and precision. Uncertainties associated with the collection of age- and size-composition data have been identified and quantified, and are accounted for in the stock assessment.	
1.1.3		<i>There is a robust assessment of the stocks</i>
1.1.3.1		<i>Is there sufficient information to detect and quantify trends in abundance?</i>
60	Fishery-dependent data (e.g. catch and effort information) are analyzed and provide the major source of information on trends. These data are supplemented by some fishery-independent survey information. Qualitative and some quantitative information exists to support the assumption that trends in standardized catch-rates reflect those in population abundance.	

80	Fishery-independent surveys are conducted frequently for most major stock components and supplement fishery-dependent indices. The behavior of the indices and their uncertainties is sufficiently well understood that there is confidence that trends in abundance will be detected.	
100	Fishery-independent surveys provide statistically-valid estimates of trends in relative abundance for all significant stocks. The data series is already sufficient to detect longer-term trends. The indices of abundance are consistent, and there is clear evidence that they are proportional to stock size. The information available is sufficient to conclude that there is very high power of detecting changes in abundance. Uncertainties are identified and have been fully analyzed.	
1.1.3.2		<i>Is the assessment method appropriate for the species?</i>
60	Stock assessments rely on generic techniques that use the major sources of data. The performance of the assessment method has yet to be evaluated.	
80	The stock assessments are conducted using generic models which are nevertheless able to account for specifics of the fishery and species. Environmental influences are included in assessment by allowing for process error. The stock assessment integrates all major sources of data. The generic models have been evaluated using simulation or by applying a range of models to same data set.	
100	The assessment models are developed specifically for the species / fishery. They capture all major features relevant to the biology of the fishery, the nature of the fishery, integrate all of the available information, and include both observation and process error within a statistically rigorous parameter estimation framework. Assessments explicitly consider both fishery and environmental impacts on stock dynamics. The models are developed specifically provide the information needed to address management questions. The assessment models have been evaluated by means of simulation to evaluate their performance has been found to be robust to a wide range of uncertainties.	
1.1.3.3		<i>Does the stock assessments take into account the implications of uncertainty in data and model structure?</i>
60	The major sources of uncertainty are documented and some attempt is made to determine the sensitivity of the estimates of key model outputs to these.	

80	The major sources of uncertainty are known and documented. There is a thorough evaluation of the sensitivity of key model outputs to the data inputs and assumptions. Retrospective analyses are conducted routinely.	
100	Uncertainty is quantified. There is a comprehensive evaluation of the sensitivity of key model outputs to the data inputs and the assumptions of the assessment model. Multiple models are considered and retrospective analyses are available.	
1.1.3.4		<i>Are uncertainties and assumptions reflected in the management advice?</i>
60	The management advice acknowledges the major uncertainties associated with the assessment and provides a qualitative summary of their implications.	
80	The management advice summarizes the implications of the major sources of uncertainty and how these uncertainties could be overcome.	
100	Important uncertainties and assumptions are considered quantitatively and their consequences for management are reflected in the management advice.	
1.1.3.5		<i>Does the assessment evaluate stock status relative to reference points and conduct projections under harvest strategies?</i>
60	The assessment includes comparisons between current stock status and reference points, and forecasts of stock status under the current harvest strategy.	
80	The assessment includes comparisons between current stock status and reference points within a probabilistic framework. The sensitivity of the forecast to key uncertainties is explored.	
100	The assessment includes a statistically robust assessment of the probability of exceeding reference points, at present, in the past, and in the future. Projections are based on a comprehensive evaluation of the consequences of a range of harvest strategies, taking account of all sources of uncertainty	
1.1.3.6		<i>Is the assessment subject to peer-review?</i>
60	The assessment is reviewed by colleagues of those who conducted the assessment.	
80	The stock assessment is subject to peer-review as part of the stock assessment process. Scientists from outside of the agency that conducted the assessments are involved in the peer-review process.	

100	The stock assessment is subject to rigorous peer-review as part of the stock assessment process and is reviewed regularly by scientists who are not part of the assessment process.	
1.1.4		There is a well-defined and effective strategy for managing exploitation of the target stocks
1.1.4.1		Are there appropriate management tools (input and/or output controls) to implement decisions and hence constrain harvests?
60	Generic management tools are used to implement management decisions and monitor their consequences. Some information is available to suggest that the tools are sufficient.	
80	The management tools used for the fishery have been evaluated and found to be effective for implementing management decisions.	
100	Management tools, appropriate to the fishery and species, have been specified to implement management decisions. The tools are responsive and timely and their ability to achieve there goals has been evaluated and continues to be monitored.	
1.1.4.2		Are appropriate target and limit reference points and levels used?
60	Generic reference points, based on international standard practice, are reported against and form the basis for management advice.	
80	The reference points / levels are in line with international standards and take account of what known about the biology of the species and the nature of the fishery. The values for the reference points can be estimated reliably for the species. There is limited scientific opposition to the reference points / levels.	
100	The reference points have been selected specifically for the species / fishery and take account of stock-specific concerns including uncertainty about stock assessments, serial depletion, and data. The reference levels meet or exceed international standard (e.g. a limit reference point for biomass above B_{MSY} and a limit reference point for fishing mortality below F_{MSY}). The reference points and levels have been developed collaboratively among all major stakeholders and there is no significant disagreement among stakeholders regarding the appropriateness of the reference points / levels.	
1.1.4.3.		Is there a clear relationship between management goals, assessment outcomes, reference points and management decisions in the form of clear, tested and agreed decision rules?
60	The management decisions are based on forecasts which are linked to the target and limit reference points.	

80	The management decisions are based on calculations that are not formalized as a decision rules, but nevertheless follow logically from the stock assessments conducted and the reference points established for the fishery.	
100	Clear, documented and tested decision rules are fully implemented. These decision rules are linked directly to the reference points and the quality of the available data.	
1.1.4.4.		<i>Are the harvest strategies are precautionary and properly applied to maintain stocks above the relevant reference points?</i>
60	Management advice is provided for each stock. Assessments report on the implications of management decisions at the stock level.	
80	Management advice is provided by stock, and management regulations account for spatial considerations. The advice is to reduce fishing mortality when the stock size drops below the limit reference points and is explicitly precautionary in face of uncertain data and models.	
100	All stocks are managed separately and stock-specific harvest strategies have been developed and tested. The harvest strategies are aimed to achieve rapid recovery if stocks approach or fall below limit reference points. Harvest rates are explicitly linked to the extent of uncertainty about data and models. The evaluation of the decision rules shows them to be robust to a wide range of uncertainties.	
1.1.5		The stocks are at or above appropriate reference levels
1.1.5.1		<i>Are the stocks at or above reference levels?</i>
60	Assessments show that the stocks are likely above their limit reference points or a rebuilding program is in place so that recovery to above the limit reference is likely within one generation.	
80	Assessments show that the stocks are being maintained above their limit reference points are are likely currently and in the future to be around their target reference points.	
100	Assessments show that there is a very high probability that all stocks are above their target reference points, and are likely currently and in the future to be around their target reference points.	
1.1.5.2		<i>Is fishing mortality below reference levels?</i>
60	Assessments show that the current level of fishing mortality is expected to keep stocks above their limit reference points.	
80	Assessments show that there is a low probability that the current level of fishing mortality will cause the stocks to drop below their limit reference points.	

100	Assessments show that there is only a very low probability that the current level of fishing mortality will cause the stocks to drop below their target reference points.	
1.1.6		There are well-designed strategies for managing significant by-product species
1.1.6.1		Is there is adequate monitoring of by-product species?
60	Catches by species are available for all major / low productivity by-product species in the QMS.	
80	Catches of all species / stocks that are in the QMS are recorded. Information on incidental catches / discards is available. Data are available on the size-/age-composition of the catches of the major by-product species.	
100	The catches (including incidental catches and discards) of all species/ stocks that are included in the QMS are recorded for all fisheries. Information on abundance is available from fishery-independent surveys for all species. Data on the size-/age-composition of the catches are collected for all species / stocks.	
1.1.6.2		Are there adequate assessments of by-product species?
60	The status of all major / low productivity by-product species is monitored using trends in relative abundance indicators.	
80	Formal stock assessments are conducted for all major / low productivity stocks. Trends in abundance indicators are analyzed for the remaining species / stocks.	
100	Reliable stock assessments based on fitting population dynamics models and quantifying uncertainty are available for all species / stocks included in the QMS.	
1.1.6.3		Are there strategies to control catches of by-product species within sustainable levels?
60	Management advice is provided for the major by-product species based primarily on trends in relative abundance, but also on the results of stock assessments for major by-product species.	
80	Management advice is provided for all by-product species based on target and limit reference points, and is used to manage effort.	
100	Fully-specified and tested decision rules are applied to determine harvest levels for each species. There are effective management controls which have been shown to be effective in the target fishery	
1.2	(MSC Criterion 2)	Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potent
1.2.1		Are measures in place to rebuild a stock if it is found to be below a target or limit reference point?

60	Measures to reduce exploitation rates are in place, and the stock is being monitored to determine the extent to which management actions are achieving the goal of rebuilding.	
80	Management measures based on an explicit rebuilding strategy designed to have a high probability of recovery to the reference point are in place. The delay in recovery to the reference level caused by fishery is expected to be no longer than one generation.	
100	Rebuilding measures are in place based on agreed decision rules that have been evaluated and found to have a very high probability of rebuilding. The delay in recovery to the reference level caused by fishery is expected to be less than one generation. A review of previous decision rules is being undertaken to determine how future recurrences of depletion can be reduced.	
1.3	<i>(MSC Criterion 2)</i>	Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity
1.3.1.1		<i>Are adequate data available to detect changes in the genetic structure of the species?</i>
60	Changes in the spatial distribution of the fishery are used to infer changes in genetic structure.	
80	Changes in the spatial distribution of the species and in abundance are used to infer changes in genetic structure.	
100	Genetic studies have been undertaken to enable a statistically rigorous evaluation of changes in genetic structure to be conducted.	
1.3.1.2		<i>Does the stock assessment and management advice consider changes in the genetic, age- and size-structure of the population?</i>
60	Data on the age- and sex-structure of the catch are routinely examined during stock assessments.	
80	The stock assessment explicitly represents the sex- and age-composition of the stocks. The sex- and age-structure of the population are accounted for when conducting projections and reporting against reference points.	
100	The stock assessment explicitly represents the sex- and age-composition of the stocks. The stock assessment outputs include time-trajectories of spawning output by stock and measures that capture the change in the sex- / age-structure of the populations.	
1.3.1.3		<i>Is there evidence for fishery induced change in the genetic structure of the species?</i>
60	Fishery-induced changes in abundance cannot be linked to changes in the genetic structure of the species.	

80	The data available (e.g. changes in spatial distribution and age-at-maturity) are sufficient to conclude that any downwards trends in abundance are not large enough to alter the genetic composition of the species.
100	There is a high level of confidence that there are no downward fishery-induced changes in reproductive capacity on genetically-identified stocks. Analyses have been undertaken to determine the power to detect changes in genetic structure.