

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE		
<b>Principle 1:</b> <b>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.</b>			<b>Overall Score</b> <b>90.1</b>	
<i>1.A. There should be sufficient information on the target species and stock to allow the effects of the fishery on the stock to be evaluated.</i>			<b>Weight</b> <b>16.7</b>	<b>Score</b> <b>85.8</b>
<b>1A.1</b> Can the species be readily identified? <b>60%</b> Poor identification threatens monitoring and increases recording errors of catches to unacceptable levels. Errors threaten reliability of stock assessment. <b>80%</b> The target species is unlikely to be confused with any other species. <b>100%</b> The species is readily identifiable by fishers and regulators.	The species is described taxonomically, together with its distribution.  Fishers can readily differentiate <i>D eliginoides</i> from the other toothfish species <i>D mawsoni</i> . However, the distribution of the two species do not overlap within Area 48.3, the South Georgia Fishing Area. Observers have not reported other toothfish species in the catches.	Gon & Heemstra, 1990  D. Agnew/I Everson, pers. Comm. CCAMLR annual catch reports Observer reports Observer interviews	16.7%	100
<b>1A.2</b> Is the life history of the species understood? <b>60%</b> There are serious gaps in information but the basis of the life history is understood. Information is adequate to support a general population model. <b>80%</b> The life history of the species is clearly documented and understood. Information is adequate to support an appropriate population model <b>100%</b> The life history of the species is clearly documented and understood including behaviour and ecological interactions.	For a deep water species, considerable information exists on the life history. Information is sufficient on those life history parameters needed for population models. Detailed information is lacking on some aspects of behaviour and ecology particularly of larvae and juveniles.  Eggs are pelagic.	Agnew et al, 1999a Everson & Murray, 1999   Evseenko et al, 1995	16.7%	80

<p><b>1A.3</b> Is the geographical range of the target stock known?</p>	<p>This Scoring Indicator is one for which the MSC Objections Panel upheld, or partially upheld, an objection.</p> <p>The original text read as follows: The stock is believed to be discrete and separated from stocks on the Burwood Bank and elsewhere by ocean current circulation and deep waters. Range of the stock is fairly well delineated geographically and by depth.</p> <p>A tagging programme has been initiated to determine the movement of fish. Oceanographic, DNA, parasite, meristic, morphometric &amp; growth rate evidence supports there being a discrete stock. Preliminary tagging results available in 2002 further support this.</p> <p>A demonstrable ongoing research programme continues to test the degree of separation.</p> <p>The conclusions of the Objection Panel may be summarised as follows: The conclusion of the Panel is that the evidence available to the Assessment Team and Certification Body, as documented in the Assessment Report, was insufficient to conclude that the South Georgia toothfish population is a reproductively isolated, genetically distinct stock. In the opinion of the Objections Panel, the evidence available to the Assessment Team that is documented in its report did not merit the score of 85 assigned to performance indicator 1A.3 which queries “Is the geographical range of the target stock known?” The report also states that “the evidence cited in the Report would support a score between 60 and 80”.</p>	<p>MRAG summary 2000 CCAMLR FSAWG-00/44 Brandon et al. 1999; Peterson &amp; Whitworth, 1989; Smith &amp; McVeagh, in press; Smith &amp; Gaffney, 2000; MacKenzie et al. 1996, Zacharov 1976</p>	<p>16.7%</p>	<p>70</p>
<p><b>60%</b> An estimate of the geographical range of the target stock is available. A management unit approximating the stock is used with some justification.</p>				
<p><b>80%</b> A reliable estimate of the geographic range of the target stock is available including seasonal patterns of movement/availability. Scientific research is used to support the stock identification.</p>				
<p><b>100%</b> The complete geographic range of the stock, including seasonal patterns of movement/availability, is estimated and documented each year. Extensive scientific research is used to justify stock identification.</p>				

	<p><b>The Objection Panel then directed that:</b>                  The Certification Body is directed to reconsider and lower below 80 the score assigned to indicator 1A.3 in light of the concerns expressed by the Objections Panel as to the inadequacy of the information cited in the Report. The Certification Body is directed to prescribe special certification conditions for the fishery that would address the concerns expressed by the Objections Panel</p> <p>Accordingly, the score for this indicator has been lowered to 70 and a condition, Condition 2, has been added to this revision of the final report. The wording of this condition has been agreed with the Objection Panel.</p>			
<p><b>1A.4</b> Is there information on fecundity/ recruitment and factors causing natural mortality?</p>	<p>Biomass surveys are conducted once every two years by the UK and usually once a year by other CCAMLR Parties, notably Russia and Argentina. Results are generally consistent between surveys. There are estimates, but relatively little information on fecundity, and uncertainty about whether all females spawn every year. A maturity ogive is used in the stock assessment.</p> <p>As with most fisheries the main sources of natural mortality are known, but quantitative information is difficult to gauge. (Factors include other fish, seals, &amp; toothed whales with increasing age of Toothfish). However, given the longevity of the species, this is considered to be fairly low. The extent of predation is taken into account in modelling.</p>	<p>Constable et al, 2000                  Constable &amp; de la Mare, 1996. D.Agnew/M. Belchier pers. comm.</p>	<p>16.7%</p>	<p>80</p>
<p><b>60%</b> There is information available on the fecundity, growth and natural mortality.</p>				
<p><b>80%</b> Estimates are available of fecundity at size, growth rates and natural mortality.</p>				
<p><b>100%</b> There is comprehensive and reliable information on the fecundity/recruitment, growth rates and factors causing natural mortality.</p>				

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<b>1A.5</b> Is the age and structure of the stock known?	Sex of the catch is determined by fisheries observers who also take large numbers of otoliths/scales for age determination. An extensive collection of representative data is available but ageing of hard parts is not yet completed. Age structure of population is therefore estimated using a growth model. Information is available describing population structure.	Observer data held by	16.7%	80
<b>60%</b> Population structure is based on some sampling and verification such as hard part rings for this species		CCAMLR		
<b>80%</b> Population structure is based on adequate sampling and verification based on hard-part rings verified for this stock. Ageing errors are estimated and included in stock assessment.		Cassia, 1998		
<b>100%</b> Population structure is well estimated with only insignificant errors.		WG-FSA reports		

<p><b>1A.6</b> Is information collected on the abundance/density of the stock?</p>	<p>This Scoring Indicator is one for which the MSC Objections Panel upheld, or partially upheld, an objection.</p>		16.7%	80
<p><b>60%</b> Either fishery dependent or fishery independent indices are available on the abundance of the stock biomass.</p>	<p>The original text read as follows: There is a demersal fish survey to 400m depth to measure recruitment and to provide an index of the proportion of adult stock to that depth. It is uncertain what proportion of the stock is sampled, although the survey is considered a sufficiently reliable index.</p>			
<p><b>80%</b> Fishery dependent and/or fishery independent indices are available on the abundance of the size/age/sex structure of the stock. Uncertainties reduced so as to allow trends to be determined from indices.</p>	<p>CPUE data from commercial fisheries are used and appear consistent with the survey data.</p>	<p>UK and Russian surveys, results presented in WG-FSA reports Yau et al, 1998</p>		
<p><b>100%</b> Fishery dependent and fishery independent indices are available on the abundance and density of the size/age/sex structure of the stock. Indices are consistent and there is clear evidence that they are proportional to the stock size.</p>	<p>MRAG/BAS hold data for UK vessels. All nationality data held by CCAMLR.</p>			
	<p>The conclusions of the Objection Panel may be summarised as follows: The Assessment Team assigned a score of 90 to indicator 1A.6, which concerns the question whether information is collected “on the abundance/density of the stock”. The Objectors did not directly challenge this score, but their stated concerns regarding surveys and CPUE data leads to the question whether the score for this indicator is too high. On review of the record, it is unclear to the Objections Panel why the indicator merited this relatively high score.</p>			

	<p>Although the surveys are conducted regularly and provide information on recruitment, they only provide an index of some (unknown) proportion of the adult stock. The only index of abundance for older / larger animals appears to be the CPUE data. While these data are standardised to allow trends to be determined, the use of CPUE as an index of abundance is always subject to considerable uncertainty. The decision rule on which catch limit recommendations are based appears to ignore the differences among sexes in terms of biological parameters and gear selectivity... It appears to the Objections Panel that the available information would, at best, justify a score of something near 80.</p> <p>In line with the requirements of the Objection Panel, the score for this indicator has been lowered to 80.</p> <p>However, there are several reasons why longline CPUE is likely to be better than other gears in tracking population trends and hence why a score of 80 is highly conservative. In particular, with other gear types (e.g. trawlers, traps or drop lining), effort is difficult to record as there is often unrecorded searching. Longlines are passive gears laid over significant areas. Catches will be dependent on fish density as well as how much fish move, bait, hook size etc. It is then possible to precisely link fish density to longline catch per hook under a wide range of circumstances (see Medley, 1989; Interaction between longline and purse seine in the south-west Pacific tuna fishery, PhD Thesis, London University). A significant advantage of CPUE is the quantity of data provided compared to fishery independent surveys. Selectivity could be checked using scientific longline and/or gillnet surveys. Standardised commercial longline CPUE is therefore considered a suitable index.</p>			
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	<p>Also, with regard to the decision rule, some evidence would be expected from the available data had females been more vulnerable to fishing, e.g. a higher preponderance of females in the catches for example. The feedback system is designed to take into account these and other uncertainties to which all fisheries are subject.</p> <p>Recommendation 2 applies.</p>			
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INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>1B There should be sufficient information on fisheries to allow effects on the target stock to be evaluated</i>			<b>16.7%</b>	<b>83.5</b>
<p><b>1B.1</b> Is fishery related mortality recorded/ estimated (including landings, discards and incidental mortality)?</p> <p><b>60%</b> Sufficient information is available to allow accurate estimates to be made of landings broken down as required by the population model. Estimates of discards and incidental mortality are available.</p> <p><b>80%</b> Landings are accurately recorded. Discards and incidental mortality are well estimated.</p> <p><b>100%</b> Landings, discards and incidental mortality are accurately recorded.</p>	<p>All CCAMLR catches in area 48.3 (landings and discards) are accurately recorded on CCAMLR forms, checked by observers, and included in TAC. Conversion factors are provided by observers and fishery. All data held by CCAMLR.</p> <p>IUU catch biomass estimates are included in stock assessments, but there is a lack of transparency in acquisition of CCAMLR IUU data.</p> <p>The records from the legal fishery are very good, but CCAMLR estimates of catches for the IUU fishery are considered to be unclear and possibly uncertain. As a result of this uncertainty, and at the request of the assessment team, recent research by MRAG gives quantitative estimates of IUU catches using a statistically rigorous method. Methods used are transparent and based upon observational data. Results represent a much improved treatment of this problem (see Annex A). These new estimates are not yet incorporated in stock assessment but are to be proposed to CCAMLR. This is an approach supported by the assessment team. New estimates confirm that IUU fishing does not represent a large proportion of the total catch in area 48.3</p>	<p>D. Agnew/I Everson, pers. comm.</p> <p>CCAMLR 2000</p> <p>MRAG 2002.</p>	43.7%	80

<b>1B.2 Is fishing effort recorded/ estimated?</b>	CPUE is recorded for long-lines (per number of hooks set) and verified by observers. Independent observers are present on all licensed vessels.	D. Agnew/I Everson, pers. Comm.	6.8%	80
60% Data are available which can be used to estimate fishing effort.		MRAG summary 2000		
80% Accurate estimates of fishing effort can be made. The relationship between the fishing effort measure and fishing mortality has been established.		Obs.		
100% Comprehensive records are kept of fishing effort, recorded at sub-annual intervals at an appropriate degree of spatial resolution.	VMS (vessel monitoring system) is mandatory and GSGSSI insists on the presentation of VMS data for the year prior to the date of licensing.			
<b>1B.3 Are fishing methods and gear types known throughout the fishery?</b>	Fishing methods are only long-line (Spanish type and Mustad autoline) (the developing pot fishery is not assessed here). Methods are verified by independent fishery observers.	D. Agnew pers. comm. and MRAG summary 2000	6.1%	100
60% Main fishing methods are known for the fishery.		GSGSSI 2000, 2001		
80% Main fishing methods are known and information is available on the geographical areas of use.				
100% All fishing methods employed in the fishery are known. In-situ observations are made of fishing practices.	IUU estimates are based on the reasonable assumption that the same methods and gear types are used			
<b>1B.4 Is selectivity known for the fishery?</b>	There are two long line types (Spanish type and Mustad autoline), the other main variant being hook size which is constant for each vessel. Size and sex of catch is recorded and checked by Fishery Observers. Size composition of population varies with depth, so constant size-dependent catchability of hook selects different portion of available stock with depth.	CCAMLR 2000	23.1%	90
60% Main methods and gear types are known and some information is available on selectivity.				
80% Selectivities of gear types are well estimated by size, sex and maturity.				
100% Full selectivities have been accurately estimated for all gears, locations and times of fishing.				

<b>1.B5</b> Are other fisheries in the area that are not subject to certification identified?	All other licensed fisheries are identified, principally icefish, crab, krill, squid.	D. Agnew/I Everson, pers. Comm.	20.3%	80
<b>60%</b> There is some information relating to other fisheries in the area that are not subject to certification, although these are not fully identified. These fisheries are accounted for in the stock assessments.	IUU fishing is taken into account in the stock assessment. New methods of estimating IUU activity provide improved estimates over those previously available.  Catch data is held by CCAMLR. By-catch is monitored in other fisheries and is known to be negligible. Bycatch of any species (monitored by observers) is counted against the TAC for that species under the CCAMLR system. An experimental pot fishery for <i>D. eleginoides</i> is under development and also managed within CCAMLR management regulations.	CCAMLR 2000, 2001 MRAG 2002.		
<b>80%</b> The main fisheries not subject to certification are identified. They are included in the stock assessments.				
<b>100%</b> All fisheries in the area that are not subject to certification are identified and monitored.				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>1C Appropriate reference levels should be developed for the stock</i>			<b>16.7%</b>	<b>91.7</b>
<b>1C.1</b> Are there appropriate limit and precautionary reference points?	The reference points are based on a precautionary approach and conform to the CCAMLR standard. The biological basis for the level of risk aversion and depletion level are not tightly tied to the biology of this species, but are conservative compared to the standard practice in fisheries.	Constable et al, 2000 Constable & de la Mare, 1996. D.Agnew pers. comm.	83.3%	90
<b>60%</b> Limit and precautionary reference points have been chosen and are justified based on standard international practice.				
<b>80%</b> Limit and precautionary reference points are justified based on stock biology (e.g. a stock-recruitment relationship).				
<b>100%</b> Limit and precautionary reference points are justified based on stock biology and statistical simulations.				

<b>1C.2</b> Do reference points meet acceptable international standards?	The model used has been reviewed thoroughly and approved by the international management organisation CCAMLR. It is based upon a standard population model used in assessment of many stocks by CCAMLR and other agencies.	CCAMLR 2000	16.7%	100
<b>60%</b> Reference points recognise appropriate international standards and are being developed to meet these.				
<b>80%</b> Reference points recognise, and are in line with, acceptable international standards.				
<b>100%</b> Reference points meet or exceed international standards.				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE		
<i>1D There should be a well-defined and effective harvest strategy to manage the target stock</i>			<b>Weight</b> <b>16.7%</b>	<b>Score</b> <b>95.0</b>
<b>1D.1</b> Is there a mechanism in place to contain harvest as required?	All vessels operating within the GSGSSI Maritime Zone are licensed by the GSGSSI. The number of licensed vessels is determined on an annual basis to control fishing pressure. This is considered an effective measure, IUU – a variety of surveillance and enforcement methods are in place. The measures have not eliminated IUU fishing although it has been deterred greatly. There is evidence that control and surveillance activities are continuing to improve. New information suggests that the current management regime has now reduced IUU fishing to very low levels. Indeed, as at April 2002, no IUU fishing had been detected since December 2000 despite increased surveillance. It is clearly important, however, that such surveillance continues.	MRAG summary 2000  Agnew, pers. Comm.  Observer reports  Obs  MRAG 2002	33.3%	100
<b>60%</b> Mechanisms to reduce harvest exist but do not fully contain harvest, or have not been tested.				
<b>80%</b> Mechanisms are in place to reduce harvest as and when required to maintain, or allow the target stock to return to, productive levels.				
<b>100%</b> Mechanisms are in place to reduce harvest as and when required to maintain (or allow the target stock to return to) productive levels. Measures to demonstrate effectiveness are in place.				
The fishery is closed by CCAMLR on a proactive basis when the TAC is forecast to have been met. GSGSSI can also close the fishery independently of CCAMLR if it is considered that the TAC has been met.				

<b>1D.2</b> Are clear, tested, decision rules set out?	Clear documented harvest control rules are in place and are applied annually in CCAMLR advice on TACs. Their efficiency has been tested in simulations, but they have not been in place long enough for field validation of their effectiveness to be assessed here.	e.g. WG-FSA 2000 4.147	33.3%	100
<b>60%</b> It can be demonstrated that decision making, though not documented, is logical and appropriate. Rules have not been tested.				
<b>80%</b> Clear decision making rules exist, are fully documented, but have not been fully tested Decision rules are reconciled with reference points.				
<b>100%</b> Clear, documented and tested decision rules are in place and have been fully reconciled with reference points.				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE		
<b>1D.3</b> Are appropriate management tools specified to implement decisions in terms of input and/or output controls?	<p>Effective measures are in place to adjust the numbers of licenses in response to changes in stock status. IUU –Current levels of surveillance and enforcement appears to be effective in addressing IUU fishing</p> <p>However, there inevitably remains a degree of uncertainty around the amount of IUU fishing taking place and future IUU fishing may be dependent upon conditions outside Area 48.3 (increased enforcement elsewhere, relative changes in stock status etc)</p> <p>Achievement of the TAC is estimated by CCAMLR on the basis of ongoing catch reports during the season, and measures to close fishery annually as TAC is achieved are effective at stopping licensed fishery.</p> <p>Overall, measures to control both IUU fishing and compliance with TAC have both been shown to be effective.</p>	<p>GSGSSI records CCAMLR reported catch and effort</p> <p>MRAG summary 2000</p> <p>SCSSI Env. Management Plan.</p>	33.3%	85
<b>60%</b> Management tools exist to implement decisions of input and/or output controls although these are not developed for the specific fishery, or management tools are not fully developed, but are specifically related to the fishery. Some evidence exists to show that tools can be effective.				
<b>80%</b> Management tools have been specified to implement decisions of input and/or output controls. These are generic although some attempt has been made to relate them to the specific fishery OR tools are lacking in some details but are specifically related to the fishery. Evidence exists to show clearly that tools are effective.				
<b>100%</b> Management tools, appropriate to the species and fishery, have been specified to implement decisions of input and/or output controls. Evidence exists to show clearly that tools fully achieve their objectives.				

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<i>1E There should be a robust assessment of the stock</i>			<b>16.7%</b>	<b>84.5</b>
<b>1E.1</b> Are assessment models used?	General yield model used is generic in structure although it uses species specific information in model formulations, and some stock-specific data in parameter estimation and risk evaluation. Data from the fishery are approaching a level sufficient to support use of an age-structured model which better captures the biology of the species and makes better use of the available data.	Constable et al, 2000	20%	85
<b>60%</b> Robust assessment models are used. These are generic and do not account for specific characteristics of either the biology of the species or the nature of the fishery.				
<b>80%</b> Assessment models are used. Major criteria are related to the species and/or the fishery, but there are some areas of the assessment that are generic.				
<b>100%</b> Assessment models are used and capture all major features appropriate to the biology of the species and the nature of the fishery.				
<b>1E.2</b> Does the assessment take into account major uncertainties in data and have assumptions been evaluated?	The model is constantly updated based on latest data and scientific information to reduce uncertainties. Uncertainties are taken into account through Monte Carlo simulation of recruitment and demographic parameters, and are fully reflected in yield estimates. The model does not take into account uncertainties in some aspects of population structure (eg age structure, sex structure) nor losses of catch to whales (although this latter issue is being investigated).  The model also uses a single best estimate for IUU catch. New estimates are available but are not yet used in the stock assessment	Constable and de la Mare, 1996 Constable et al 2000 Agnew pers comm.  MRAG 2002	20%	85
<b>60%</b> Major uncertainties are identified. Some attempt has been made to account for these in the assessment.				
<b>80%</b> The assessment takes into account major uncertainties in the data and functional relationships. The most important assumptions have been evaluated.				
<b>100%</b> The assessment takes into account all significant uncertainties in the data, functional relationships and evaluates the assumptions.				

<p><b>1E.3</b> Are uncertainties and assumptions reflected in management advice?</p>	<p>The TAC reflects CCAMLR precautionary policy, and involves risk averse choices derived from the quantified uncertainty in future stock trajectory. An exception is that decision rules do not take into account potential future IUU fishing in excess of advised TACs, which increases the risk of overfishing even if the licensed fishery is within the estimated yield.</p> <p>However, the seriousness of this depends on the magnitude of future IUU fishing within area 48.3. Improved estimates of IUU activity provide increased confidence on extent of this. Nevertheless, the decision rule does not take existence of IUU into account.</p> <p>The effects of excluding IUU catch from the TAC is not additive over time as each year's assessment takes account of the estimated IUU fishing that has occurred in the previous assessment period, and the impact of past IUU fishing on the stock. Therefore the problem only applies to the sustainability of the annual TAC, not the long-term future stock trajectory.</p> <p>This issue is addressed by Certification Condition 6</p>	<p>Constable et al, 2000 D. Agnew pers comm</p>	<p>20%</p>	<p>77.5</p>
<p><b>60%</b> Major uncertainties are recognised and are reported in management advice.</p>				
<p><b>80%</b> Major uncertainties and assumptions are taken into account in management advice through the decision rules.</p>				
<p><b>100%</b> All uncertainties and assumptions are taken into account and reflected in the management advice.</p>	<p>MRAG 2002</p>			

<b>1E.4</b> Does the assessment evaluate current stock status relative to reference points?	The assessment evaluates stock status relative to reference points.  It is noted, however, that the stock status is not reported in a fully transparent and readily accessible way. This information could be directly reported as part of the current assessment. Its absence in the stock summary from the Stock Assessment Working Group does not affect the decision rule or management controls (TAC), which are reported, and appear to be calculated consistently.	D. Agnew/I Everson, pers. comm. Constable and de la Mare, 1996 Constable et al 2000	20%	90
<b>60%</b> Some attempt is made to estimate the stock status relative to reference points.				
<b>80%</b> The assessment makes an approximated evaluation of the stock status relative to the reference points.				
<b>100%</b> The assessment makes a reliable probabilistic evaluation of the stock status relative to the reference points.				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE		
<b>1E.5</b> Does the assessment include the consequences of current harvest strategies?	Past harvests and future constant harvests are included in the assessment.  The decision rules include the consequences of the TAC set by the management authority, but their effectiveness have only been tested with simulations, so it is not known if the method of including the consequences of current harvest is fully reliable. There has been no retrospective analysis to test the effectiveness of the harvest strategy. A sufficient time series of data may now be available for this to be done.  GSGSSI is now committed to funding a two year programme to validate current assessment methods, investigate new methods and investigate the effects of new decision rules for this fishery.	Constable and de la Mare, 1996 Constable et al 2000  D Agnew pers. comm.	20%	85
<b>60%</b> The assessment makes a crude approximation of the consequences of current harvest strategies.				
<b>80%</b> The assessment makes a robust approximation of the consequences of current harvest strategies.				
<b>100%</b> The assessment includes the consequences of current harvest strategies and forecasts future consequences of these.				

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<i>IF The stock(s) should be at appropriate precautionary reference level(s)</i>			<b>16.7%</b>	<b>100</b>
<b>1F.1</b> Is the stock(s) at or above reference levels? <b>60%</b> The stock is close to the limit reference levels. <b>80%</b> The stock is above the precautionary reference levels <b>100%</b> The stock is significantly and consistently above appropriate reference levels.	Yes. Current assessments estimate the stock to be well above the reference level, and the harvest strategy is designed to ensure that this remains the case; see 1E.4 Reference levels are recognised to be precautionary and the harvest level rules ensure that the harvest is reduced before precautionary levels are exceeded.	Constable and de la Mare, 1996 Constable et al 2000	100%	100
<b>1F.2</b> If the stock is below the precautionary reference point, is rebuilding specified in the decision rule being implemented? <b>60%</b> Rebuilding measures exist and are fully implemented. Measures have not been tested. <b>80%</b> Appropriate rebuilding measures are being implemented. Measures have been tested and can be shown to be rebuilding the stock. <b>100%</b> Additional measures are being implemented to prevent problems in the future.	Not Applicable	-	N/A	N/A

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE		
<b>Principle 2: 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.</b>			<b>Overall Score 81.4</b>	
<i>2A There should be adequate determination of ecosystem factors relevant to the geographical scale and life-history strategy of the target species</i>			<b>Weight 19%</b>	<b>Score 82.3</b>
<p><b>2A.1</b> Are the nature and distribution of habitats relevant to the fishing operations known?</p> <p><b>60%</b> Some information exists but may not be comprehensive or up to date. The distribution of fishing operations is mapped.</p> <p><b>80%</b> Nature and distribution of all main habitats are known in moderate detail. Information is recent. The distribution of fishing operations is monitored.</p> <p><b>100%</b> The nature and the distribution of all habitats relevant to the fishing operations are known in detail. Information is recent.</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer’s concerns and additional commentary are presented below.</p> <p>The original text read as follows: Benthic habitats are poorly described due to the depths at which fishing occurs, and there is a lack of research on benthic communities in SGSSI waters. The areas of fishing activity are monitored accurately by observers.</p> <p>Fishing masters are known to target hard substrate.</p> <p>This issue is addressed by Recommendation 3.</p> <p>Peer Review comments were: Kevin Stokes: For category A, the one score that falls below 80% is 2A.1, relating to knowledge of habitats. The nature of the fishery (long-lining) is such that habitat interaction (including damage) is unlikely (although it is noted at 2D.1 that some entanglement in coral has occurred). It is not surprising therefore that there is also little information on habitat despite the fact that targeting on hard substrates has been described.</p>	<p>D. Agnew/I Everson/M Belchier, pers. comm.</p> <p>Observer reports</p>	<p>7.0%</p>	<p>70</p>

	<p>The low score (70%) is probably reasonable, but only in conjunction with the low weight (as used). It is notable that the habitat factor enters in at 2A.1, 2D.1, 2E.1 and 2E.4; as such, the real weight given to this issue is greater than would appear from any one Indicator.</p> <p>Further explanation on this point by the assessment team is presented below.</p> <p>Knowledge of the location of areas of complex benthic habitat (particularly biogenic features), and areas of fishing activity, is seen as an appropriate precautionary measure to be taken by the fishery. This issue is now addressed by Condition 10.</p> <p>Although interactions of the fishery with benthic habitat are likely to be limited in extent and significance, some impacts have been reported. Raising of the allocated score is therefore not considered appropriate by the assessment team.</p>			
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<p><b>2A.2</b> Is information available on non-target species affected by the fishery?</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer's concerns and additional commentary are presented below.</p>		60%	85
<p><b>60%</b> The main non-target species have been identified.</p>				
<p><b>80%</b> Information is available on the main non-target species affected by the fishery including their distribution and/or ecology.</p>				
<p><b>100%</b> Information is available on all non-target species affected by the fishery including the distribution and ecology.</p>	<p>The original text read as follows:</p> <p>By-catch of fish, birds and mammals by all licensed vessels is recorded by CCAMLR observers. No data are available for by-catch by IUU vessels. CCAMLR makes annual estimates of bird bycatch for both licensed and IUU fishing in Area 48.3, based on observer records and numbers of hooks set (licensed vessels) and trade statistics (IUU fishing). IUU estimates are improved by new developments.</p> <p>UK makes annual reports to CCAMLR of fishing gear found associated with seabirds at Bird Island, South Georgia. British Antarctic Survey collects demographic and foraging ecology data from South Georgia seabirds affected by longlining. Bird records are well kept and their ecology well documented. Populations from which the birds come is not fully known, however. In terms of fish by-catch, the long-line fishery affects primarily skates, rays and grenadiers. Information is available on general distribution and ecology of these species, but not population sizes. New programmes of research are now underway to investigate this matter further.</p>	<p>Roberts, 2000; Woehler &amp; Croxall, 1997; Woehler et al., ms.; Latest British Antarctic Survey annual report</p> <p>MRAG 2002</p> <p>Agnew et al 1999b</p> <p>D Agnew pers. comm.</p>		

	<p><b>Peer Review comments were:</b></p> <p>Euan Dunn: The <b>scoring guidelines</b> highlight ‘<i>distribution and ecology</i>’ but do not make any specific mention of <i>population/stock size</i> as a key element of the ‘information available’, and I would regard this as a serious omission (although it is alluded to in the <b>Comments</b> on rajids). <b>Comments</b> should make reference to <b>condition 4</b> which requires reference points to interpret the effects of by-catch on rajid populations, and to establish the biological basis of mitigation measures for rajids.</p> <p>Further explanation on this point by the assessment team is presented below.</p> <p>This indicator seeks to establish knowledge of those non-target species which interact with the fishery in question (the amount of bycatch and the population impacts of it are important considerations, but are addressed fully in other indicators). Specifically, this knowledge is required to include the general biology/ecology of the species concerned. In terms of by-catch species, Indicator 2B.1 seeks to evaluate knowledge on the <i>amount</i> of by-catch taken, and indicators 2E.3 and 2E.5 seek to establish the <i>significance</i> of this by-catch in terms of ecosystem structure and function, diversity and productivity. Determination of significance is then in part dependent upon the knowledge of species biology and ecology asked for here. The indicators therefore build in a logical sequence of knowledge of receptor – fishery impact – significance.</p>			
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	<p>Knowledge of population/stock sizes is therefore an issue for these later indicators. As a point of procedure, Conditions can only be raised if an Indicator attains a score of less than 80.</p> <p>This indicator attained a score of 85. Indicator 2E.5, however, scored less than 80 and it is at this point that compliance with Condition 4 (relating to rajid by-catch) is required.</p> <p>There is no dispute of the facts presented in relation to this indicator and so the assessment team have confirmed the original score.</p>			
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INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	8.8%	75
<p><b>2A.3</b> Is information available on the position and importance of the target species within the food web?</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer's concerns and additional commentary are presented below.</p> <p>The original text read as follows:</p> <p>General information on prey items is known, primarily squid, krill and smaller fish. Predators are believed to be larger fish, seal and toothed whales with increasing size of toothfish.</p> <p>There is little information available on prey species targeted by fish below the size at which toothfish are recruited to the fishery.</p> <p>The role of toothfish in the overall energy flow of the shelf seas ecosystem is not quantified .</p> <p>Peer Review comments were: Edith Fanta: The score seems to be more 60 than 80, because there is little information available on prey species targeted by fish below the size at which toothfish are recruited to the fishery, and there is no quantitative estimation of the role of toothfish in the overall energy flow of the shelf seas ecosystem. Only information on these two items will make sure the impact of <i>D. eleginoides</i> on the foodweb.</p>	<p>D. Agnew/I Everson, pers. comm. Garcia de la Rosa et al 1997</p>	8.8%	75
<p><b>60%</b> Key food/prey items are known.</p>				
<p><b>80%</b> Information is available on the position and general importance of target species in the environment at key life stages.</p>				
<p><b>100%</b> Quantitative information is available on the position and importance of the target species within the food web at key life stages.</p>				

	<p>This was also a point raised by the <a href="#">Objection Panel who wrote:</a></p> <p>“Another area that needs more emphasis in the weighting is the effect of the toothfish on overall ecosystem functioning. As DeVries says in his comments “our knowledge of the deep-water habitat is relatively limited.” As well there is little knowledge as to where the toothfish fits into the big picture, especially in a quantitative sense.”</p> <p>The <a href="#">Moody Marine Governing Board</a> also raised a concern over this area, and made a recommendation that:</p> <p>“greater consideration be given in research programmes to identifying the ecosystem relations of toothfish and the overall impacts of toothfish fishing”.</p> <p><a href="#">Further explanation on this point by the assessment team is presented below.</a></p> <p>As noted in the scoring commentary, there is information on the position and general importance of toothfish at the (key) stage of recruiting into the fishery. Moreover, although energy flows have not been quantified for this ecosystem, it is not necessary to fully quantify ecosystem energy flows for information to be available on the “<i>general importance</i>” of a top predator in a marine food web. While this was considered to meet, at a minimum, the 80 level, the concerns of a peer reviewer, Objection Panel and Governing Board are noted.</p> <p>Accordingly, to accommodate these concerns, the score for this indicator has been lowered to 75.</p> <p>This therefore requires the setting of a condition in order for the fishery to meet the minimum level required within an appropriate timescale. An additional Condition, Condition 9, has therefore been set.</p>			
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<p><b>2A.4</b> Is there information on the potential for the ecosystem to recover from fishery related impacts?</p>	<p>British Antarctic Survey collects demographic and foraging ecology data for South Georgia seabirds affected by longlining. Data are made available to CCAMLR and SCAR for analysis and modelling purposes. There is some evidence of albatross recovery once fishery mortalities have been reduced.</p>	<p>Woehler &amp; Croxall, 1997; Woehler et al., ms.; Latest BAS ann rep</p>	<p>24.2%</p>	<p>80</p>
<p><b>60%</b> Key elements of the functioning of the ecosystem, relevant to the fishery, are identified.</p>	<p>There is evidence that depleted fish stocks could be very slow to recover, based on the experience of marbled rock cod in this area and general information on recovery of high-latitude and deep-water long-lived species.</p>	<p>ICES 2001 (advice to EU on deepwater species</p>		
<p><b>80%</b> The main elements of the functioning of the ecosystem, relevant to the fishery, have been documented and are understood.</p>	<p>Although not considered a major impact of this fishery, benthic recovery would be expected to be slow</p>	<p>D. Agnew/I Everson, pers. comm.</p>		
<p><b>100%</b> Detailed information is available on the potential for affected elements of the ecosystem to recover from fishery related impacts.</p>	<p>By-catch of fish from the long-line fishery is recorded routinely. Fish by-catch in the fishery involves mainly rays (Rajidae) and grenadiers (Macrouridae).. Ongoing work on the biology of both skates/rays and macrourids is undertaken as part of the British Antarctic Survey Science Plan for South Georgia, and further research on rays is underway through the observer programme operated by Imperial College, London. As part of these programmes, information has been published on distribution and aging in rays, and on identification, ageing and general biology of macrourids, while ongoing work includes a PhD study on the effects of ray by-catch on populations, with the aim of producing a draft shark IPOA (International Plan of Action). Global literature gives information on skate and ray recovery potential.</p>	<p>Agnew, Taylor &amp; Everson, 1999 D Agnew pers comm</p>		

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>2B General risk factors should be adequately determined</i>			<b>19.0%</b>	<b>81.5</b>
<p><b>2B.1</b> Is information available on the nature and extent of the by-catch (capture of non-target species)?</p> <p><b>60%</b> Qualitative information is available on significant by-catch species.</p> <p><b>80%</b> Quantitative information is available on significant by-catch.</p> <p><b>100%</b> Accurate records are kept on the nature and extent of all by-catch species including species size and sex composition.</p>	<p>See also 2A.2.</p> <p>The licensed fishery has very good records, based on observer data. Observer coverage includes the entire licensed fleet, and compliance is believed to be improving because the CCAMLR black list is taken into account when licencing.</p> <p>IUU fishing – annual estimates of by catch of birds are made by CCAMLR but are highly uncertain. CCAMLR range of estimates include historical worst cases performance of the licenced fleet. New studies on IUU, however, improve and quantify estimates of bird by-catch and are more clearly derived. The previous degree of uncertainty is therefore much reduced.</p> <p>Fish by-catch (e.g. skates, rays, grenadiers) is monitored by observers, this includes both landed and encountered (i.e. those knocked off the snood before landing). The landed (on the boat) catch of rays in 2002 was 13.3 tons and the landed catch of grenadiers was 2.8 tons. The effects of this by-catch on ecosystem structure and function are considered by the assessment team as being unlikely to be significant, but populations of these are not well known, which is of potential concern principally for rays, but also grenadiers. However, by-catch rates for rays in South Georgia are reported to be low in relation to other fisheries in the Southern Ocean. This information should be extrapolated with IUU fishing estimates within 48.3 to include catches by IUU vessels.</p>	<p>Observer data</p> <p>CCAMLR records</p> <p>MRAG 2002</p>	55.5%	80

<b>2B.2</b> Is information available on the extent and impacts of discard (the proportion of the catch not landed)?	<p>There is negligible intentional discard of the target species, the hook sizes used mean almost all toothfish retained by the gear used are of the desired size range.</p> <p>For the licensed fishery and IUU, estimates of non-target species discard is equivalent to by-catch, these not being landed.</p> <p>Issues of bird discard are considered elsewhere.</p> <p>The extent of IUU discard, and the consequences of this, are not known, but new improved estimates of IUU activity now allow the implications of this to be better estimated.</p>	MRAG 2002	16.6%	80
<b>60%</b> Information is available of the extent of discarding, including a species list.				
<b>80%</b> Information is available to allow estimates of discard to be calculated and interpreted.				
<b>100%</b> Accurate information is available on the extent of all discards, and consequences of these, or the entire catch is landed.				

<b>2B.3</b> Is there information on any unobserved fishing mortality?	<p>CCAMLR require reporting of predation on hooked fish (by counting heads remaining). Long-lines are known to be targeted by Orca, to a much lesser extent by sperm whale and, to lesser extent still, by seals. The extent of this mortality, however, can only be gauged when heads remain. Observer data is considered adequate to provide accurate estimates. This source of fish loss is actively avoided by fishermen and hence is small, although it is not counted against the TAC.</p>	Observer reports and pers. comm.	19.5%	85
<b>60%</b> Areas of potential unobserved fishing mortality are identified but no further information is available.				
<b>80%</b> Information from existing work has allowed estimates of unobserved fishing mortality to be made.				
<b>100%</b> Research has been carried out on unobserved fishing mortality allowing accurate estimates to be made (or it is known that significant unobserved mortality does not occur).	This would apply equally to IUU fishing.			

<b>2B.4</b> Are the effects of supply and use of bait known?	<p>Two main types of bait are used: squid from south west Atlantic and horse mackerel from the Namibian coast. All are stored frozen, but thawed prior to use.</p> <p>Introduction of exotic species is therefore not an issue. The SW Atlantic squid fishery is monitored by Imperial College (Renewable Resources Assessment Group) and Falklands Fisheries Department.</p> <p>Full effects on horse mackerel fishery are not known. However, the Namibian fishery is not thought to be poorly managed and is highly productive. The impacts of supply to this fishery are therefore not considered significant.</p>	Agnew, pers comm	5.4%	90	
<b>60%</b> Types of bait, extent of use and sources of supply are known.					Observer records of bait
<b>80%</b> There is adequate knowledge of the use of bait including sources and amounts and there is sufficient information to indicate that collection of bait does not cause significant conservation problems.					
<b>100%</b> All significant impacts of the supply and use of bait are known.					

<p><b>2B.5</b> Are the potential and significance of introduced/relocated species known?</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer’s concerns and additional commentary are presented below.</p> <p>The original text read as follows:</p> <p>The fishery is north of 60° S. If it was south of this latitude, the use of bait would be contrary to the Antarctic Treaty’s Environmental Protocol, Annex II. However, all bait is stored frozen, and this is an open ocean fishery, so the potential introduction of species through the use of bait is not considered to be problematic. The same would apply to IUU fishers.</p> <p>Peer Review comments were: Edith Fanta: The score could be 100 if only frozen bait is used. Is there no record about that?</p> <p>Further explanation on this point by the assessment team is presented below.</p> <p>It is acknowledged that bait is transported frozen (usually at around –20C) and is thawed only prior to setting. No other routes of introduced or relocated species were apparent. The fishery would not score 100 as there is no information that this issue is monitored and this monitoring subsequently recorded. However, as the significance of the fishery in introducing species to the area is considered low, a higher score has been considered appropriate by the assessment team. The score is therefore raised from 80 to 90. We would also point out the low weighting applied to this Scoring Indicator.</p>	<p>Agnew, pers comm Observer records of bait</p>	<p>3.0%</p>	<p>90</p>
<p><b>60%</b> There is recognition of potential sources of introduced/relocated species.</p>				
<p><b>80%</b> Potential routes and significance of introduced/relocated species directly related to the fishery are known.</p>				
<p><b>100%</b> Potential routes and significance of introduced/relocated species directly related to the fishery are known and monitored. Records are kept.</p>				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<p>2C The fishery should be conducted in a manner which does not have unacceptable impacts on recognised protected, endangered or threatened species</p>			<p><b>19.0%</b></p>	<p><b>79.0</b></p>
<p><b>2C.1</b> Is there information on the presence and populations of protected species?</p> <p><b>60%</b> Ther main protected species directly related to the fishery are known and there is a program in place to identify other protected, threatened and endangered species directly related to the fishery.</p> <p><b>80%</b> Protected, threatened and endangered species directly related to the fishery have been identified.</p> <p><b>100%</b> There is knowledge of all populations of protected species directly or indirectly related to the fishery including an assessment of temporal variability. The type and distribution of critical habitats have been identified.</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer’s concerns and additional commentary are presented below.</p> <p>The original text read as follows:</p> <p>British Antarctic Survey collects demographic and foraging ecology and at-sea distributional data for South Georgia seabirds affected by longlining. Data are published and made available to CCAMLR and SCAR for analysis and modelling purposes. Conservation status of “Red Data” species affected by longlining is given in terms of IUCN Categories of Threat. There are records of foraging range, breeding areas, and post-fledging dispersal.</p> <p>Routine monitoring of whale populations is carried out by the International Whaling Commission. CCAMLR monitors dependent predators. Records show no cetacean and one seal mortality in whole southern ocean. No mortality has been recorded in 48.3.</p> <p>Peer Review comments were: Euan Dunn: Comments note that BAS collects various data for SG birds affected by longlining but, as Indicator 2A.2 points out, the ‘Populations from which the [caught] birds come is not fully known...’. Given this hiatus, the score of 95% is excessive.</p>	<p>Robertson &amp; Gales 1998; BirdLife International 2000</p> <p>Agnew 1997 SC CCAMLR reports</p>	<p>12.8%</p>	<p>95</p>

	<p>Further explanation on this point by the assessment team is presented below.</p> <p>As discussed under Indicator 2A.2 above, this first Indicator seeks to establish the extent of <i>knowledge</i> of rare species present within the area of the fishery under assessment, rather than the impacts of the fishery or the significance of such impacts. The issue of effects of longlining on populations of caught birds is therefore an issue for Indicator 3C.3.</p> <p>In terms of what is practically achievable for this 'fishery', the knowledge of populations of rare species within the area of the fishery was considered by the assessment team to be very good. The existing score of 95 is therefore still considered to be appropriate.</p>			
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<p><b>2C.2</b> Are interactions of the fishery with such species adequately determined?</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer's concerns and additional commentary are presented below.</p>		27.6%	80
<p><b>60%</b> The main interactions directly related to the fishery are known.</p>	<p>The original text read as follows:</p>			
<p><b>80%</b> Quantitative estimates are made of the effects of interactions directly related to the fishery.</p>	<p>The CCAMLR <i>ad hoc</i> Working Group on Incidental Mortality arising from Fishing (WG-IMAF) analyses seabird mortality data annually. The Bird Biology Subcommittee of the Scientific Committee on Antarctic Research (SCAR) analyses population status and trends of affected seabirds at CCAMLR's request, at four-yearly intervals. This utilises modelling approaches where long-term data sets exist. UK makes annual reports to CCAMLR of fishing gear found associated with seabirds at Bird Island, South Georgia. Reliable, quantitative estimates are made of direct impacts. Indirect impacts of reducing seabird populations are available, but are much more uncertain than direct effects.</p>	<p>Woehler &amp; Croxall, 1997; Roberts, 2000; SC-CAMLR 2000; Woehler et al., ms.</p>		
<p><b>100%</b> Reliable quantitative estimates are made of the interactions of all populations directly related to the fishery, and qualitative information is available on indirect impacts.</p>	<p>Seals are monitored by CCAMLR's Ecosystem Monitoring Programme.</p> <p>IUU – interactions are estimated quantitatively by CCAMLR but with associated uncertainty on the extent of IUU. Recent work in relation to Area 48.3 has expanded on these previous estimates and considerably reduced this uncertainty</p>	<p>BAS Annual Report SC report 2000</p>		
		<p>MRAG 2002</p>		

	<p><a href="#">Peer Review comments were:</a></p> <p>Euan Dunn: Comments note that recent work in relation to Area 48.3 has expanded on previous CCAMLR estimates of IUU fishing and considerably reduced uncertainty on the extent of IUU. This is true but it is important not to run too far ahead and we must attach proportionate weight to the new model of IUU catches. My evaluation indicates that the model is indeed a step in the right direction but the robustness of estimates and precision could improve quite considerably with further development of the model. In addition, we do not know the level of hook discarding with fish heads nor adequately understand the impact of this on seabird populations. Taking these factors into account, 80% is an over-generous score.</p> <p><a href="#">Further explanation on this point by the assessment team is presented below.</a></p> <p>In relation to the scoring indicators applied to this Indicator, quantitative estimates <b>are</b> made of interactions related to the fishery. For the licensed fishery, these are extremely reliable. For the IUU fishery, the new model provides <b>estimates</b>. Dr Dunn suggests a number of refinements of the model but recognises that “none...suggest that the model as presented underestimates IUU fishing and if anything it may tend to do the opposite”.</p> <p>Also, for hooks (an indirect impact?), amounts of discarded gear is recorded, rather than estimated.</p> <p>Against the scoring indicators, therefore, the comments made would suggest a lowering from the 100, more than the 80 guidepost. The score of 80 reflects the conservative approach adopted by the assessment team and is considered appropriate. Indeed, a case could be made to increase this score to 85 or 90.</p>			
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<p><b>2C.3</b> Do interactions pose an unacceptable risk to such species?</p>	<p>This Scoring Indicator is one for which specific concerns were raised by two of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer's concerns and additional commentary are presented below.</p>		59.5%	75
<p><b>60%</b> Known effects are within acceptable limits of national and international legislative requirements.</p>	<p>The original text read as follows:</p>			
<p><b>80%</b> Critical interactions are well estimated and do not threaten protected species.</p>	<p>Seabird mortality from longline fishing has been assessed globally and specifically for the South Georgia fishery. Conservation status of affected seabirds has been assessed in terms of IUCN Categories of Threat.</p>	<p>Brothers et al., 1999; Robertson &amp; Gales 1998; BirdLife International 2000</p>		
<p><b>100%</b> It is known that the direct and indirect effects of fishing on threatened and endangered species are within acceptable limits.</p>	<p>CCAMLR bird bycatch estimates are bounded by lower and upper bounds. The lowest bound is the best by-catch rate from 1997, the upper bound, the worst by catch rate from 1997. These are split for summer/winter ratios.</p>	<p>BAS Annual Report</p>		
	<p>However, if by-catch were predominantly in summer, (through IUU fishing) this could significantly affect populations. IUU fishery therefore represented a significant level of uncertainty. Accordingly, at the request of this assessment team, IUU has been separately estimated within 48.3. These improved estimates of IUU fishing have increased the level of certainty on the extent of IUU fishing in 48.3, which is estimated to now be at very low levels, However, based on the IUCN categories of threat, any and all interactions still threaten protected species. The score allocated here reflects the current effort and ongoing improvement in estimation and control of IUU fishing.</p>	<p>WG-FSA WG-IMALF 2000 7.149</p>		

	<p>Currently, total (global) seabird mortality levels are unsustainable, any contribution to this mortality (through IUU fishing or as a by-catch of the licensed fishery) must therefore be considered, in the strictest sense, a threat to protected species. However, mortality associated with the licensed fishery is considered to be to be negligible and control of IUU fishing to be the relevant management goal.</p> <p>See also 2C.1</p> <p><b>Peer Review comments were:</b></p> <p>Edith Fanta: The score should be less than 60, if we consider all countries, including the pirate ones, involved in <i>Dissostichus</i> fisheries. As in the South Georgia fishery there is, unfortunately, still IUU fishing, there is still no control over bird by catch. It is certainly not zero. Considering the risk for the species of birds that are captured, this incidental bird catch is not within acceptable limits, because some species are in the IUCN list of Threatened species. However, I believe that, as soon as the South Georgia Government has total control over the fishery in the region, and no more IUU fishing occurs, the problem will be totally reversible. I believe that, if the methods that are recommended by the CCAMLR conservation measures are fully applied, the incidental capture of birds will be totally, or close to totally avoided</p> <p>Euan Dunn: The 100% scoring guideline is that <i>‘It is known that the direct and indirect effects of fishing on threatened and endangered species are within acceptable limits’</i>, which assumes quantitative knowledge. However this is at odds with the 100% scoring guideline for Indicator 2C.2 whose criteria require only <i>‘qualitative information’</i> to be <i>‘available on indirect impacts’</i>.</p>			
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	<p>Further explanation on this point by the assessment team is presented below.</p> <p>Re Dr Fanta’s comments. Dr Fanta states that “The score should be less than 60 if we consider all countries, including the pirate ones, involved in <i>Dissostichus</i> fisheries.” This is clearly a wide ranging comment and not specifically directed at the South Georgia fishery. Dr Fanta goes on to say “as soon as...no more IUU fishing occurs, the problem will be totally reversible” and “if the methods that are recommended by the CCAMLR conservation measures are fully applied, the incidental capture of birds will be totally, or close to totally avoided”. The result of the IUU modelling (also acknowledged by the Objection Panel) is that IUU fishing within subarea 48.3 was negligible over the period evaluated and the assessment team found that enforcement and compliance with conservation measures within the licensed fishery was good.</p> <p>Although not taken into account here for scoring purposes, the latest (unconfirmed) information from the fishery is that in the last fishing season (2003) bird deaths were the lowest ever recorded, (2 petrels, 0.0003 birds per 1000 hooks), compliance with conservation measures within the fishery is virtually total and IUU fishing has been negligible, or absent, for the last two years. CCAMLR further states that this level of catches has a negligible effect on the populations of birds affected.</p> <p>The fishery seems therefore to be moving increasingly towards the 80+ level.</p>			
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	<p>Re Dr Dunn's comments. The 100 guidepost for Indicator 2C.2 require reliable quantitative estimates of direct effects (which would be expected to comprise the major impact) and qualitative information on indirect impacts (which may often be unquantifiable). The 100 guidepost for this Indicator requires evaluation of all available information and assessment as to their combined impact and acceptability.</p> <p>On this basis, we consider our score of 75 for this indicator to be appropriate and precautionary and the condition raised (Condition 3) to be appropriate.</p>			
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INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>2D There should be adequate knowledge of the effects of gear-use on the receiving ecosystem and extent and type of gear losses</i>			<b>4.8%</b>	<b>82.5</b>
<p><b>2D.1</b> Is there adequate knowledge of the physical impacts on habitat due to use of gear?</p> <p><b>60%</b> Main impacts of gear use on the habitat are identified including extent and location of use. Habitat perturbations appear sustainable.</p> <p><b>80%</b> All impacts of gear use on the habitat are identified including extent and location of use and estimates of habitat recovery times.</p> <p><b>100%</b> The physical impacts on the habitat due to use of gear have been studied and quantified, including details of any irreversible changes.</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer’s concerns and additional commentary are presented below.</p> <p>The original text read as follows:</p> <p>Observer reports indicate somewhat restricted fishing areas, and a preference by fishing masters/skippers for areas of hard substrate. Some entanglement in coral is reported. A preliminary assessment by MRAG suggests minimal likely importance as only static gear is used. Vulnerabilities of benthic habitats to static gear are generally not thought to be high, but the issue has not been studied in SGSSI waters. These areas are thought not to have been previously impacted widely by mobile gears, although there was some impact during earlier fisheries for icefish in shallow (&lt;300m) waters.</p> <p>Peer Review comments were:</p> <p>Edith Fanta: The score should be 60. There is effectively not a study on the impact of bottom long lines on the seabed fauna and flora. One knows that, considering the extension of the area, this impact is, possibly, negligible. However, depending on the intensity of fishing effort in small fishing units, the frequency of fishing, the extension of lines, this may reduce the local biota considerably. This may imply in reduction or effects on those organisms that depend on this biota for feeding, and have secondary or tertiary consequences to the other links of the food chain.</p>	<p>Observer Reports</p> <p>D Agnew, Unpublished study, pers. Comm.</p>	16.7%	65

	<p>Further explanation on this point by the assessment team is presented below.</p> <p>It is regularly the case that where information is lacking, it is because it is reasonably considered a low priority. This one such case, as raised by Kevin Stokes in his comments under Indicator 2A.1.</p> <p>The analysis carried out to inform the assessment (Agnew pers. comm.) estimated the overall benthic impact of longline hooks and weights combined from a typical season in which 14 vessels fished for 100 days each, which was calculated at less than 1 km<sup>2</sup>, or about 0.001% of the overall area of fishable seabed. Therefore, fishing areas are known, and are known to comprise only a modest portion of the total benthic area, which supports the view that habitat impacts, to the extent they occur, are sustainable.</p> <p>Also, general information on impacts of static gear is available and has been considered. The peer reviewer acknowledges this in the observation that “One knows that, considering the extension of the area, this impact is, possibly, negligible.” To extrapolate from impacts that are, at most, local and minor to “secondary or tertiary consequences to the other links of the food chain” is considered a tenuous basis for concluding that the score should be a minimum pass.</p> <p>Clearly, then, the score lies between 60 and 80 and the assessment team originally adopted a score of 70 because there is substantial information about the extent and location of gear use, and there is general knowledge of the very long recovery times for cold water corals. To accommodate Dr Fanta’s comments, however, we have lowered this score to 65.</p> <p>Condition 10 applies.</p>			
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<p><b>2D.2</b> Is there adequate knowledge of gear lost during fishing operations?</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer's concerns and additional commentary are presented below.</p>		83.3%	80
<p><b>60%</b> Some recording of gear losses takes place.</p>	<p>The original text read as follows:</p>			
<p><b>80%</b> There is knowledge of the type, quantity and location of gear lost during fishing operations. Estimates made show that losses do not cause unacceptable effects on the ecosystem.</p>	<p>There is a very high degree of information from observers on loss of lines from the legal fishery. Lost gear (hooked and baited long lines or baited pots) is recorded and verified by Observers. Also, gear is marked according to vessel.</p>	<p>Roberts, 2000; SC-CAMLR 2000</p>		
<p><b>100%</b> There is detailed knowledge of the type, quantity and location of gear types lost during fishing operations. The impact of gear loss on target and non-target species has been measured and shown to have negligible effects on habitats, ecosystems or species of concern.</p>	<p>However, hooks lost in cut-away entanglements and in discarded fish heads are not always recorded by CCAMLR observers and are rarely quantified. Such discarded hooks and lines are sometimes swallowed by seabirds, especially albatrosses and taken to breeding sites where may be regurgitated to chicks.</p>	<p>Agnew pers comm Observer data, reports, and workshop</p>		
	<p>We note current proposals to determine the extent of this issue and that the extent of hook loss in offal may vary considerably between vessels.</p>	<p>D Agnew pers comm</p>		
	<p>The same degree of loss would be expected from the IUU fishery.</p>			

	<p><a href="#">Peer Review comments were:</a></p> <p>Euan Dunn: The score (85%) is very high considering that hooks lost in cut-away entanglements and discarded fish heads is '<i>rarely quantified</i>' by observers and is likely to have a higher impact on seabirds (though this impact is not adequately known) than loss of lines from the legal fishery. Moreover, the score is higher than the 80% scoring guideline which requires '<i>Estimates made show that losses [of gear] do not cause unacceptable effects on the ecosystem.</i>' I suggest that this score should reflect the 60% guidepost (= '<i>Some recording of gear losses takes place</i>') until such time as (1) the incidence of hooks discarded in this way is properly monitored, and (2) removal of hooks from fish heads prior to discarding becomes a CCAMLR conservation measure (as recommended by WG-IMALF 2000-2001).</p> <p><a href="#">Further explanation on this point by the assessment team is presented below.</a></p> <p>This Indicator considers two issues: the loss of hooked and baited long lines (for which the fishery would attain a score between 80 and 100) and the discard of hooks in fish heads (which are now required to be removed under Conservation Measure 25-02 (2002)), for which the fishery would score between 60 and 80. The concerns of Dr Dunn are noted, however, and the assessment team have adopted a combined revised score of 80. This revision does not take account of the recently adopted conservation measure which is expected to increase the score in future.</p>			
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<b>2D.3</b> Is there any information on extent and significance of ghost fishing?	Amphipod predation of lost bait is reportedly extremely rapid (hours) indicating that a short duration of ghost fishing is likely. Hence this criterion is not considered important to this fishery.	Agnew pers comm	N/A	N/a
<b>60%</b> The effects of ghost fishing has been estimated in some way, for example from experiments.				
<b>80%</b> Records of ghost fishing exists and estimates are made of the extent and significance of the impacts to target and non-target species.				
<b>100%</b> Records are kept of the extent of ghost fishing on target and non-target species. Estimates of impacts are made.				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>2E Assessments of impacts associated with the fishery should include the significance and risk of each impact, and show no unacceptable impacts on the ecosystem structure and/or function, on habitats or on the populations of associated species?</i>			<b>19.0%</b>	<b>75.7</b>
<b>2E.1</b> Have all the significant effects of the fishery on the ecosystem been identified?	<p>This Scoring Indicator is one for which specific concerns were raised by two of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer’s concerns and additional commentary are presented below.</p> <p>The original text read as follows:</p> <p>Impacts on bird by-catch are clearly identified. Impacts on fish by-catch are identified although studied less well than for birds.</p> <p>Impacts related to IUU fishery are now much better estimated and the significance of these impacts on affected species are accordingly also better estimated.</p> <p>Disturbance of benthic habitats is poorly studied and there are possible effects on cold water corals, although static gear would be expected to have far less damaging effects than trawl gear.</p> <p>Effects of seabird mortality are regularly assessed by British Antarctic Survey, CCAMLR, IUCN and SCAR.</p> <p>Trophodynamic effects are not quantified, but the management objective should result in a standing stock of toothfish large enough to play its role as a predator in the ecosystem.</p>	<p>SC-CAMLR 2000</p> <p>SC CCAMLR reports MRAG summary 2000 MRAG 2002</p>	26.3%	70
<b>60%</b> Main impacts of the fishery on the ecosystem are known				
<b>80%</b> There is a comprehensive evaluation of the effects of the fishery on the ecosystem.				
<b>100%</b> The effects of the fishery on the ecosystem have been identified by appropriate comparative and/or experimental studies.				

	<p><a href="#">Peer Review comments were:</a></p> <p>Edith Fanta: The score should be 60. Main impacts of the fishery are known, but the evaluation is still not comprehensive, if we consider the whole of the ecosystem. We have to consider that there is IUU fishery and that this may impact the environment in an uncontrollable way, and also that there is poor information on the impact of such fishery on the benthic fauna and flora.</p> <p>Euan Dunn: The score allocated (75%) is close to the 80% scoring guideline that '<i>There is a comprehensive evaluation of the effects of the fishery on the ecosystem</i>'. This is ambitious, given that an ecosystem model for the fishery has not been developed (Recommendation 2 for certification is designed to remedy this). Given this, and that the impact of (notably) discharging fish heads with hooks remains to be evaluated, I would regard 60% as a more appropriate guidepost (= '<i>Main impacts of the fishery on the ecosystem are known</i>'.)</p> <p><a href="#">Further explanation on this point by the assessment team is presented below.</a></p> <p>As described for Indicators 2A.2 and 2C.1, this first Indicator seeks to establish essentially the amount of information available. Also, in applying the MSC standard, we look for information from a variety of sources rather than a single documented source.</p> <p>With these points in mind, and in relation to the scoring guideposts set for this Indicator, the assessment team were not satisfied that a comprehensive evaluation had been carried out and so a score of less than 80 was originally considered appropriate.</p>			
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	<p>However, the actions that have been taken by CCAMLR/GSGSSI have led to the identification (in many cases demonstrated by the adoption of appropriate conservation measures) of all likely direct sources of impact of the fishery on the ecosystem. Even without the aid of an ecosystem model, at least many of the potential indirect effects can be identified from the fairly complete knowledge of the direct effects (by applying the same reasoning that would be used to build an ecosystem model). Indirect effects that cannot be inferred logically from the direct ones which have been identified in the CCAMLR/GSGSSI work could still exist, but they would also have to be biologically “significant” in order to justify a score as low as 60%.</p> <p>In relation to the issues identified by the peer reviewers:          IUU fishing – has been identified as a significant effect          Benthic impacts – have not been well studied as discussed elsewhere.          Trophic effects are recognised as being addressed through management objectives          Discard of fish hooks has been recognised and has begun to be addressed.</p> <p>The assessment team still consider that the identification of fishery-related impacts goes some way past the 60 guidepost but, recognising the concerns raised by the peer reviewers, has reduced this score from 75 to 70.</p> <p>Conditions 4, 8, 9 and 10 refer.</p>			
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<p><b>2E.2</b> Does the removal of target stocks have unacceptable impacts on ecosystem structure and function?</p>	<p>CCAMLR adopts a precautionary approach to ecosystem management, considered to preclude unacceptable impacts. There is knowledge of the amount of stock taken, and the management system adjusts annually to both licensed and estimated IUU catch, to keep the population above CCAMLR objective limits.</p> <p>However, the absence of a specific ecosystem model prevents quantitative estimate of effects.</p> <p>This is addressed in Recommendation 2.</p>	<p>Agnew pers comm Constable et al, 2000 SC-CCAMLR reports and FSA-WG reports</p>	<p>7.3%</p>	<p>80</p>
<p><b>60%</b> The removal of target stocks may have unacceptable impacts on ecological systems (applying the precautionary approach where necessary). A program is in development to reduce these to acceptable, defined limits.</p>				
<p><b>80%</b> Some information is available on consequences of current levels of removal of target species. These suggest no unacceptable impacts of the fishery on ecological systems within major fishing areas.</p>				
<p><b>100%</b> The ecological consequences of current levels of removal of target stocks has been quantified and documented to be within acceptable, pre-determined, limits.</p>				

<p><b>2E.3</b> Does the removal of non-target stocks have unacceptable impacts on ecosystem structure and function?</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer’s concerns and additional commentary are presented below.</p>		7.3%	80
<p><b>60%</b> The removal of non-target stocks may have unacceptable impacts on ecological systems (applying the precautionary approach where necessary). A program is in development to reduce these to acceptable, defined limits.</p>	<p>The original text read as follows:</p>			
<p><b>80%</b> Some information is available on consequences of current levels of removal of non-target species. These suggest no unacceptable impacts of the fishery on ecological systems within major fishing areas.</p>	<p>Reductions in population sizes of affected seabirds at South Georgia are reported by British Antarctic Survey. Mitigation measures in place in licensed fisheries are thought adequate to keep mortality levels very low during setting and hauling. Where individual seabird populations are reduced to levels of unacceptable risk to the species, this is an undesirable effect on biological diversity (an ecosystem structural property).</p>	<p>Roberts, 2000; SC-CAMLR 2000</p>		
<p><b>100%</b> The ecological consequences of current levels of removal of non-target stocks has been quantified and documented to be within acceptable, pre-determined, limits.</p>	<p>Further reduction in number of lost hooks in discarded fish heads is desirable and the extent of this is now being determined. Seabird mortality by the IUU fishery has recently been estimated by MRAG and the results of this estimation considered here. Mortality may be particularly high if IUU fishing takes place in summer breeding months with day-light setting. The report on IUU fishing to inform this assessment, however, states that, for operational and concealment reasons, many IUU vessels also set at night.</p>	<p>Agnew pers comm MRAG 2002</p>		
	<p>Fish by-catch is recorded but the effects on ecosystem structure and function are unlikely to be important. Populations are not well known, which is of potential concern principally for rays, but also grenadiers. By-catch rates for rays in South Georgia are reported to be low in relation to other fisheries in southern ocean and mitigation measures are in place to reduce this by-catch</p>	<p>Agnew et al 1999, 2000.</p>		

	<p><b>Peer Review comments were:</b></p> <p>Euan Dunn: Comments state (1) that the extent of hook discarding in fish heads is <i>now</i> [my italics] being determined. Is this true, given that CCAMLR observers rarely quantify this and that condition 7 proposes monitoring precisely this as a condition for continuing certification? (2) <i>'Fish by-catch is recorded but the effects on ecosystem structure and function are unlikely to be important'</i>. This appears at odds with Comments in 2E.5, namely that <i>'rays are known to be susceptible even in productive ecosystems. The fragility of this ecosystem... makes this a considerable concern.'</i> Given these queries, the score of 80% is generous and the current state of play more closely reflects the 60% guidepost.</p> <p><b>Further explanation on this point by the assessment team is presented below.</b></p> <p>The issue of hook loss in discarded heads has been mentioned here for completeness but is not significant in relation to the scoring of this indicator (<i>removal of non-target stocks</i>), and is considered more fully elsewhere.</p> <p>The recorded by-catch rates and measures in place to minimise fish by-catch were considered by the assessment team to be sufficient to suggest that impacts would not be unacceptable. We do, however, seek reassurance on this issue, hence the raising of Condition 4, with particular attention to species whose life-histories suggest that they can support relatively low rates of bycatch mortality.</p> <p>On balance, therefore, the assessment team consider the score allocated to this indicator to be appropriate.</p>			
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SG Toothfish Scoring Table v2 The Licensed Patagonian Toothfish Longline Fishery of South Georgia

<b>2E.4</b> Does the fishery have unacceptable impacts on habitat structure?	Use of static gear (see 2E.1) and monitoring of what is brought up in gear suggests impact is small, but there is no monitoring by benthic surveys or underwater camera records.		12.7%	75
<b>60%</b> There is no evidence that the fishery is having unacceptable impacts, although the issue has not been directly studied.				
<b>80%</b> No unacceptable impacts of the fishery on habitat structure within major fishing areas have been demonstrated.				
<b>100%</b> Effects on habitat structure are documented and are within acceptable tested/justified limits.	This issue is addressed through Recommendation 3.			

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	46.5%	75
<p><b>2E.5</b> Is associated biological diversity and productivity affected to unacceptable levels?</p> <p><b>60%</b> There is no evidence that the fishery is having unacceptable impacts, although the issue has not been directly studied.</p> <p><b>80%</b> The effects of the fishery on biological diversity and productivity have been considered and no unacceptable impacts have been found.</p> <p><b>100%</b>. The effects of the fishery on biological diversity and productivity have been quantified and are within acceptable tested/justified limits</p>	<p>This Scoring Indicator was one for which specific concerns were raised by two of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer’s concerns and additional commentary are presented below.</p> <p>The original text read as follows:</p> <p>Reductions in population sizes of affected seabirds at South Georgia reported by British Antarctic Survey, in some cases, are unacceptably great. Mitigation measures in place in licensed fisheries are thought adequate to keep mortality low during setting and hauling, but reduction in numbers of lost hooks in discarded fish heads is desirable. In the case of hooks lost in offal, we note that studies are now underway to address this issue.</p> <p>Recent calculations of the extent of IUU fishing within Area 48.3 greatly improve on previous estimates. The extent of IUU fishing reported, and calculated, is now much reduced and with greater confidence in the results obtained. It is, however, essential that current levels of surveillance and enforcement be maintained</p> <p>Despite the absence of confirmatory information from an ecosystem model, no elements of the fishery would be expected to affect productivity.</p>	<p>Roberts, 2000; SC-CAMLR 2000</p> <p>MRAG 2002</p>		

	<p>Susceptibility of rajids to fishing impacts is not studied here, although impact reduction measures are in place. However, rays are known to be susceptible even in productive ecosystems. The fragility of this ecosystem (lack of buffering to perturbations) makes this a considerable concern. We note current measures to further determine the significance of effects on rajid populations. By-catch by IUU vessels should also be considered based on current estimates of IUU fishing activity.</p> <p><a href="#">Peer Review comments were:</a></p> <p>Edith Fanta: The score should be 60. This is because there is no assessment of the impact of <i>D. eleginoides</i> fishery on Rajiidae, neither in the regulated nor in the IUU fishery.</p> <p>Euan Dunn: The scoring guidelines do not fully describe the breadth of options in the actual situation. The existing guidelines assume that <i>all</i> the potential effects have been studied/quantified. In the case of this fishery, however, not all of the impacts have been fully studied (i.e. the impact on rajids needs to be evaluated, likewise the impact of jettisoning fish heads containing embedded hooks). This being so, the allocated score (75%) is inevitably subjective and does not necessarily reflect reality.</p>			
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	<p>Comments: (1) begin with the statement that ‘<i>reductions in population sizes of affected seabirds at SG reported by BAS, in some cases, are unacceptably great.</i>’ It is confusing to have comments in some cases confined to interactions between seabirds and the toothfish fishery in the SGMZ alone (which is the correct terms of reference for this evaluation), and in others (as here) the presumed effects mainly of longline fisheries <i>outside</i> the SGMZ and Subarea 48.3;</p> <p>(2) state that ‘<i>studies are now underway</i>’ to address the issue of hooks lost in offal. Is this true? – if so, this initiative is not mentioned in the Certification Report;</p> <p>3) third para which begins ‘Despite confirmatory information from an ecosystem model...’ should presumably read ‘Despite lack of confirmatory information from an ecosystem model....’.</p> <p><a href="#">Further explanation on this point by the assessment team is presented below.</a></p> <p>This indicator considers a range of issues, with a different level of performance against each. The score allocated on some issues would therefore be over 80, because some impacts on biodiversity, such as on seabird populations have been evaluated directly, and found to be sustainable for this fishery. For others, the score would be below 80, but still above 60, because at least some aspects of impacts on the more vulnerable components of local biodiversity, such as rajids, are being monitored through the by-catch species composition, which would detect significant relative changes in population abundance (and more focused studies are required in Condition 4).</p> <p>Studies of hook discard were carried out in 2002 but, due to difficulties in estimating the number of hooks being discarded, GSGSSI pressed for a prohibition on discarding which was inserted in a CCAMLR conservation measure in 2002 and strengthened in 2003.</p>			
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	<p>The eventual score (as mentioned by Euan Dunn) requires judging the weight of evidence on many different effects on biodiversity and productivity. The issues of rajid by-catch and discarded hooks prevent the fishery from attaining a score of 80 or more, but these are being addressed and are not the most significant sources of impact on diversity or productivity. The assessment team therefore considers the original score of 75 to be appropriate.</p> <p>Conditions 3, 4, 8, 9 and 10 refer.</p>			
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INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>2F Strategies should be developed within the fisheries management system to address and restrain any significant impacts of the fishery on the ecosystem</i>			<b>19.0%</b>	<b>88.3</b>
<b>2F.1</b> Are levels of acceptable impact determined and reviewed?	<p>CCAMLR Ecosystem and Monitoring (EMM) and IMAF Working Groups assess population trends and impacts on seabirds from longlining annually, recommending mitigation measures to keep impacts low. CCAMLR and GSGSSI check compliance with CCAMLR mitigation measures from observer reports and by at-sea patrols and inspections, and GSGSSI rewards compliance when issuing licenses in subsequent years. IUU fishing vessels are assumed to practice no mitigation. Levels of acceptable impacts are identified and reviewed for seabirds. Some estimates of acceptable catches are available for rajids – there is a daily catch ceiling above which boats must stop fishing and move to different grounds, but the scientific basis for bycatch ceilings is not defined. GSGSSI has a programme of investigating the effects of fish by-catch, implemented by MRAG/BAS. This is currently being extended, specifically for rajids.</p> <p>Use of static gear is expected to have much lower impacts on the seabed than trawl gear.</p>	SC-CAMLR 2000	33.3%	80
<b>60%</b> There is sufficient information to determine acceptable impacts for main target and non-target species and habitats.		Agnew pers. comm Ashford & Croxall, 1998 CCAMLR?		
<b>80%</b> Levels of acceptable impacts (e.g biological reference points) for key aspects of the ecosystem within main fishing areas have been estimated and are regularly reviewed.		WG-IMALF 2000		
<b>100%</b> Levels of acceptable impact for key populations (such as of indicator species) and habitats have been estimated and are subject to frequent review.				

<p><b>2F.2</b> Are management objectives set in terms of impact identification and avoidance/reduction?</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer's concerns and additional commentary are presented below.</p>	<p>CCAMLR conservation measures D Agnew pers comm GSGSSI 2000, 2001</p>	<p>33.3%</p>	<p>90</p>
<p><b>60%</b> Limited management systems exist in terms of impact identification and avoidance/reduction.</p>	<p>The original text read as follows:</p>			
<p><b>80%</b> Management objectives are set to detect and reduce impacts. These are designed to adequately protect key aspects of the ecosystem within main fishing areas.</p>	<p>See 2F.1. Overall ecosystem objectives are set by CCAMLR, and translated into operational objectives for this fishery. Some objectives are set for skate and ray by-catch, but are being developed further.</p>			
<p><b>100%</b> Tested management objectives are set to detect and reduce impacts These are designed to adequately protect ecosystems, habitats and populations of target and non-target species.</p>	<p>Numerous objectives are set in terms of bird impact avoidance, although there are problems associated with trying to protect migratory bird populations. Control of IUU is clearly a high priority. Important objectives of both CCAMLR and GSGSSI are minimisation of IUU.</p> <p><b>Peer Review comments were:</b> Edith Fanta: The score should be 80. Key aspects of the ecosystem are protected if we are talking about the regulated fishery and do not take into consideration the skates and rays bycatch. However, the last is important because they might be vulnerable to extensive fishing activities, by both, the regulated and the unregulated fishery. The last one impacts also on birds. This is why I believe that there are management objectives set to reduce in part, but not to avoid the impacts.</p>			

	<p>Further explanation on this point by the assessment team is presented below.</p> <p>There are a range of objectives operating in this fishery including objectives for by-catches of skates and rays and for rates of IUU fishing. Most of these are tested and are specifically designed to protect the ecosystem. The assessment team has considered deficiencies in objectives for rajids in reducing the score to 90 and, in line with scoring throughout, consider this to be a conservative and precautionary score.</p>			
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<p><b>2F.3</b> Are management measures in place to modify fishery practices in light of the identification of unacceptable impacts?</p>	<p>This Scoring Indicator is one for which a specific concern was raised by one of the peer reviewers. Accordingly, in line with the requirements of the MSC Objections Panel, the original text, the peer reviewer's concerns and additional commentary are presented below.</p> <p>The original text read as follows:</p> <p>CCAMLR Ecosystem and Monitoring (EMM) and IMAF Working Groups assess population trends and impacts on seabirds from longlining annually, recommending mitigation measures to keep impact levels low. CCAMLR and GSGSSI check compliance with CCAMLR mitigation measures from observer reports and by at-sea patrols and inspections, and GSGSSI rewards compliance when issuing licenses in subsequent years. This control is being strengthened via VMS checks on vessels when applying for licences and stringent licence conditions (for example the track record in compliance is considered for the fishing company and not just vessel). Recent modifications to licencing and surveillance are seen as positive moves.</p> <p>Monitoring of IUU and measures to eliminate it are in place. New records of IUU activity in 48.3 show increased success in controlling IUU, but we are aware that this may be affected by activities outside of Area 48.3.</p> <p>It is not demonstrated that measures to protect skates and rays are fully effective, but we note new and ongoing research targeted at improving understanding of this situation.</p>	<p>SC-CAMLR 2000</p> <p>CCAMLR Conservation measures</p> <p>MRAG 2002</p> <p>Agnew pers. comm</p>	<p>33.3%</p>	<p>95</p>
<p><b>60%</b> A mechanism exists for the modification of fishing practices in light of the identification of unacceptable impacts, but the effectiveness of this mechanism are not fully demonstrated.</p>				
<p><b>80%</b> Effective management measures are in place to modify fishery practices in light of the identification of unacceptable impacts.</p>				
<p><b>100%</b> Monitoring programs are in place within the management system to allow modification of fishery practices in light of the identification of unacceptable impacts. Objectives and limits for environmental change are used to guide operational practices. It is demonstrated that these are effective.</p>				

	<p><a href="#">Peer Review comments were:</a></p> <p>Edith Fanta: The score is not 100 only because of IUU. With IUU it drops to 80. Besides that, there is also the problem of the development of some new practices in order to avoid the possibly significant by catch of Rajiidae.</p> <p><a href="#">Further explanation on this point by the assessment team is presented below.</a></p> <p>Management measures are in place, and their effectiveness has been demonstrated, this includes measures to prevent IUU fishing which, for a number of years, has been considered negligible. The issue of IUU fishing would, therefore, attain a high score for this Indicator. We agree on possible deficiencies in measures to protect rajids and this led to the original score being 95. This score is therefore still considered to be appropriate.</p>			
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INDICATORS	COMMENTS	AUDIT TRACE REFERENCE		
<b>Principle 3:</b> <b>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.</b>			<b>Overall Score</b> <b>90.3</b>	
<i>3A The fishery has a management system with clear lines of responsibility</i>			<b>Weight</b> <b>14.3%</b>	<b>Score</b> <b>86.9</b>
<b>3A.1</b> Are organisations with management responsibility clearly defined including areas of responsibility and interactions? <b>60%</b> Organisations with management responsibility are known. Responsibilities and interactions are to be determined. <b>80%</b> Organisations with management responsibility have been defined including key areas of responsibility and interaction.	Responsibility for developing and promulgating the management plan for the fishery within SGSSI clearly lies with Government of the Territories of SGSSI. The Management Plan (Ordinance) specifies clearly the authorities and responsibilities of the Commissioner, Director of Fisheries, and Officers. The role of CCAMLR with regard to the catch certification system is less clear, because implementation is at the level of member states. Obligations of member states to enforce all provisions of catch certification scheme and assess penalties for non-compliance are not clearly specified. Fishing under flags of convenience and trans-shipping in ports of states not signatories to CCAMLR create opportunities for fishing with few or no lines of responsibility. Overall management lines are clear. Opportunity to change flag state makes lines of responsibility weaker, but this is addressed in SG licencing arrangements.. Details of responsibility of organisations (SG, UK Govt, EU, CCAMLR, Flag states) are not always very clear.	GSGSSI Fisheries (Conservation and Management) Ordinance 2000;  Agnew, in press.	18.4%	85
<b>100%</b> Organisations with management responsibility are clearly defined including all areas of responsibility and interaction.				

<p><b>3A.2</b> Does the management system contain clear short and long-term objectives?</p>	<p>The Environmental Management Plan for South Georgia contains clear and specific long-term goals for fisheries in the area, and for the ecosystem. The CCAMLR Convention contains clear and explicit conservation objectives, and associated principles, for individual species and the ecosystem. Short Term goals for SGSSI are implicit not explicit; Short-term goals for CCAMLR are reflected in quantitative annual TACs advised to comply with long-term objectives. Research objectives include by-catch reduction. No time-specific targets are set for IUU control or by-catch reduction.</p>	<p>Environmental Management Plan for South Georgia (section 3.2). CCAMLR Convention – Introductory paragraph on website.</p>	<p>18.4%</p>	<p>90</p>
<p><b>60%</b> Short and long-term resource and environment objectives are implicit within the management system.</p>				
<p><b>80%</b> The management system contains short and long-term resource and environment objectives.</p>				
<p><b>100%</b> The management system contains clear short and long-term resource and environment objectives that can be measured by performance indicators.</p>				



<b>3A.3</b> Do operational procedures exist for meeting objectives?	Detailed operational procedures exist for:	a) SGSSI Fisheries Ordinance 2000	19.5%	90
60% Operational procedures exist which are applied to the meeting of objectives.	a) Management of South Georgia Fisheries (reasonably well proven)	b) Constable et al 2000 & refs therein; CCAMLR		
80% Transparent operational procedures are applied to the meeting of objectives. These procedures can be shown to support the objectives.	b) Management of harvesting activities within CCAMLR jurisdiction (some uncertainty exists about effectiveness)	Observers manual, CCAMLR conservation		
100% Operational procedures are transparent and clearly applied. There is a feedback mechanism testing effective application.	c) Catch monitoring system (largely unproven for this fishery. Some accusations of loopholes)	measures (listing on website)		
	There is an annual analysis of efficacy, and feedback on control, of the legal fishery	c) [c] CCAMLR		
	For the IUU fishery, CCAMLR inform GSGSSI on control of IUU fishing. Control measures implemented by GSGSSI (utilising advice from MRAG) include the use of two patrol vessels, although these are shared with the Falkland islands. This equates to one patrol vessel active for half of each year.	Conservation measures		
	However, it is noted that GSGSSI did not access the CCAMLR website listing licenced vessels in the fishery. This is now reported to have been rectified.	170/XIX; Resolution 14/XIX; Resolution 15/XIX. & Agnew in press		
		D. Agnew, pers comm		

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE		
<b>3A.4</b> Are there procedures for measuring performance relative to the objectives?	CCAMLR has a tested system for measuring performance of resource management actions relative to objectives for target species and the ecosystem. There are good performance measures relative to objectives. GSGSSI relies on CCAMLR (policy body) for feedback on management performance. Responsibility for review of performance within GSGSSI, where objectives are not necessarily the same as objectives of CCAMLR, is not explicitly stated anywhere but the relationship with MRAG gives the possibility for such a performance measure function to be served. GSGSSI does monitor observer records and can close the fishery before CCAMLR request closure.	CCAMLR website entry Kock 2000 Agnew, 1997.	7.8%	90
<b>60%</b> Operational procedures exist which can be used to measure performance relative to the objectives.				
<b>80%</b> There are procedures used for measuring performance relative to the objectives.				
<b>100%</b> Tested procedures are used for regular measurement of performance relative to the objectives.				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE		
<b>3A.5</b> Do objectives and operational procedures follow the precautionary approach?	Many of the individual Conservation measures of CCAMLR explicitly refer to application of a precautionary approach, and are intended to increase the margin of safety when uncertainty is high. Catch	CCAMLR Conservation Measures	20.7%	85
<b>60%</b> Some objectives and procedures implement a precautionary approach.				
<b>80%</b> Key objectives and procedures explicitly implement a precautionary approach.				

<p><b>100%</b> All objectives and procedures explicitly implement a precautionary approach.</p>	<p>reporting, observer reports, and the annual assessment cycle monitor effectiveness of precautionary measures. The need for compliance by non-signatories and the opportunity to "opt out" of provisions may weaken effectiveness.</p> <p>CCAMLR objectives and risk averse decision making are considered adequate and can react correctively in the following year for estimated amount of IUU fishing. Risk aversion increases as uncertainty increases.</p> <p>GSGSSI only licence vessels with a high compliance with CCAMLR.</p> <p>Clear written feedback to stakeholders on performance may improve compliance.</p> <p>It was considered that without better/realistic estimates of the IUU, the TAC is not sufficiently risk averse. These improved estimates are now available and should be included in TAC allocations. The precautionary approach would be further strengthened by improved risk analysis for toothfish and relevant elements of the ecosystem</p>			
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<p><b>3A.6</b> Does the system include a consultative process including affected parties?</p>	<p>For management measures based on GSGSSI there is little opportunity for consultation.</p>	<p>CCAMLR Rules of Procedure (Basic Documents – Part 3, December 2000)</p>	<p>6.9%</p>	<p>85</p>
<p><b>60%</b> The system includes a consultative process including main stakeholders within the fishery, some stakeholders are excluded.</p>	<p>For CCAMLR Conservation Measures, all signatory countries must reach consensus, so there is a significant opportunity (often a requirement) to consult with signatory governments and their industries. The opportunity exists for consultation with non-signatory states, e.g. when there is a sighting of a non-member vessel or over the CDS (the latter including, for example Mauritius and Namibia).</p>	<p>CCAMLR Report of the Eighteenth Meeting of the Commission - CCAMLR XVIII</p>	<p>6.9%</p>	<p>85</p>
<p><b>80%</b> The system includes a consultative process including all key stakeholders.</p>	<p>Consultation mechanisms of member states with their industries are highly variable and poorly documented. Environmental NGO's and other stakeholders are allowed observatory and participatory role in CCAMLR (Scientific Committee). This is a key element of the system.</p>	<p>D Agnew pers comm</p>	<p>6.9%</p>	<p>85</p>
<p><b>100%</b> The system includes a consultative process including all affected stakeholders.</p>	<p>The GSGSSI licensing process, as reviewed in May 2001 lacked transparency. It is noted, however, that the degree of transparency surrounding this process is now increasing with a statement of fishery licence policy and increased dialogue with boat owners. The licensing system is now reported to be completely transparent.</p>	<p>D Agnew pers comm</p>	<p>6.9%</p>	<p>85</p>

<p><b>3A.7</b> Is there an appropriate mechanism for the resolution of disputes within the system?</p>	<p>For SGSSI operations, appeal mechanisms are specified in Fisheries Ordinances. the appeal mechanisms are not applicable to all forms of disputes, but are typical of enforcement systems.</p>	<p>CCAMLR Rules of Procedure (Basic Documents – Part 3, December 2000)</p>	<p>8.2%</p>	<p>80</p>
<p><b>60%</b> A program is being developed to allow for resolution of disputes within the system, but has not been tested.</p>	<p>Within CCAMLR there are extensive measures for resolution of disputes among member states. These include the ability of parties formally to file disputes for resolution.</p>			
<p><b>80%</b> There is an appropriate mechanism for the resolution of disputes within the system.</p>	<p>There are few mechanisms for resolution of disputes with non-members of CCAMLR. There is substantial external criticism of effectiveness of mechanisms to resolve disputes between CCAMLR and non-member states.</p>			
<p><b>100%</b> There is an appropriate and tested mechanism for the resolution of disputes within the system.</p>	<p>GSGSSI give clear guidance to licensing requirements, but there is little opportunity to dispute licensing arrangements. GSGSSI explains verbally reason for non-licensing. The only formal appeal mechanism is through legal means. Again, though it is noted that the degree of transparency surrounding this process is now increasing with a statement of fishery licence policy and increased dialogue with boat owners.</p>			

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>3B The management system has a clear legal basis?</i>			<b>14.3%</b>	<b>96.6</b>
<b>3B.1</b> Is the fishery consistent with International Conventions and Agreements?	The legal fishery is regulated completely within the CCAMLR Convention. Many elements of fishery management have been evaluated at a number of Meetings of the Standing Committee on Observation and Inspection.  Fundamental to the MSC Standard is the compliance of	Annual Reports from SCOI to the Commission. Annex V, CCAMLR Report of the Eighteenth Meeting of the Commission - CCAMLR XVIII	32.0%	100
<b>60%</b> An evaluation is being undertaken to show compliance with relevant international agreements. There is no evidence that the fishery is not consistent with agreements.				
<b>80%</b> An evaluation has been undertaken and fishing appears to comply with international agreements.				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE
<p><b>100%</b> An evaluation has been undertaken which clearly shows that the management system is compliant with all relevant international agreements.</p>	<p>the fishery with international and national legislation relevant to fishery management. It was therefore key to the assessment fishery that the fishery be in full compliance with any conservation measures, resolutions or decisions of the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) relevant to its functioning.</p> <p>The conclusion of the assessment was that the UK does not exempt South Georgia from any such conservation measures, resolutions or decisions. In particular, it is noted that CCAMLR allows for the implementation of national conservation measures within waters adjacent to islands within the CCAMLR area over which the existence of state sovereignty is recognised (Statement by the Chairman of the CCAMLR, 1980).</p> <p>South Georgia and the South Sandwich Islands are subject to an on-going sovereignty dispute between the UK and Argentina. Whilst we acknowledge the dispute over which state has sovereignty, the existence of sovereignty by some state, and the acknowledgement by CCAMLR of a states ability to implement National measures within adjacent waters, seems clear. The assessment therefore considered both CCAMLR management measures and measures implemented by the relevant authority in South Georgia, as established by the Chairman of the CCAMLR, 1980.</p> <p>The illegal fishery is operating in direct violation of relevant international agreements. IUU fishing is therefore clearly not compliant with CCAMLR and GSGSSI requirements. Control methods for combating IUU – monitoring, arrest, legal penalties etc – are, however, consistent with international conventions and agreements.</p>	<p>CCAMLR Observer reports with regard to compliance.</p>

<b>3B.2</b> Is the fishery consistent with national legislation?	The legal fishery is completely consistent with the SGSSI ordinances. The IUU fishery is non-compliant with SGSSI ordinances, but control of IUU fishing is consistent with requirements.	SGSSI Fishery Ordinance. CCAMLR Observer reports with regard to compliance of the legal fishery	32.0%	100
<b>60%</b> An evaluation is being undertaken to show compliance with relevant national agreements. There is no evidence that the fishery is not consistent with national legislation.				
<b>80%</b> An evaluation has been undertaken and fishing appears to comply with national legislation.				
<b>100%</b> An evaluation has been undertaken which clearly shows that the management system is compliant with all relevant national legislation.				

<b>3B.3</b> Does the system observe the legal and customary rights of people dependent upon fishing?	There are no indigenous inhabitants of SGSSI. No settlers were historically dependent on this new fishery, as Falkland Islanders historically were only associated with the whaling stations on South Georgia.	Information about South Georgia Island	4.0%	95
<b>60%</b> The customary and legal rights of the people dependent upon fishing are known and no major conflicts have been recorded.				
<b>80%</b> The system observes the legal and customary rights of people dependent upon fishing but does not necessarily have a formal codified system.	Legal rights of fishers are observed by the system. It is not codified.			
<b>100%</b> The system observes all legal and customary rights of people dependent upon fishing under a formal codified system.				

<b>3B.4</b> Are fishers aware of legal requirements?	Fishing can only be conducted with a licence obtained in advance from the SGSSI Fisheries office of the Director of Fisheries. Obtaining a licence ensures a high degree of familiarity with the legal requirements of the fishery, including a CCAMLR Observer. Observer Reports indicate that the intent to comply with the legal regulations is generally good, and often excellent.	SGSSI Ordinances; Observer reports and SCOI Annual Reports.	32.0%	90
60% Fishers are aware of some, but not all, requirements.	Participants in the IUU fishery are reported to operate in ways that suggest high awareness of the legal requirements, but an active desire to avoid compliance. The Catch documentation scheme, although being seen as a positive move, is still considered to be too new to have a demonstrated level of awareness of its legal (to member states) requirements, among those involved in post-harvest trade.	IUU fishery information – ASCO (and others)		
80% Fishers are aware of legal requirements upon them and are kept up to date with new developments.	Skippers are given a copy of legal requirements in their own language. There is no formal code of conduct beyond CCAMLR requirements. CCAMLR has produced stickers, posters, seabird mitigation booklet etc informing on mitigation measures. There is no evidence of this being fully communicated to licensed vessels.	Catch Documentation Program – CCAMLR Conservation measures 170/XIX; Resolution 14/XIX; Resolution 15/XIX Agnew in press		
100% All fishers are aware of legal requirements. There is an effective code of conduct, incorporating legal requirements, that is fully supported by the fishers.				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>3C The management system operates in a manner appropriate to the objectives of the fishery</i>			<b>14.3%</b>	<b>93.3</b>
<b>3C.1</b> Does the system include subsidies that contribute to unsustainable fishing? <b>60%</b> A number of subsidies exist that contribute to unsustainable fishing. These are short-term and are in the process of being removed. <b>80%</b> The system includes no subsidies that contribute to unsustainable fishing. <b>100%</b> The system contains no subsidies that could contribute to unsustainable fishing	No direct subsidies are known to contribute specifically to fishing for toothfish. However, the fishery is made up of vessels from many nations. Direct and indirect subsidies almost certainly exist to varying degrees in the individual states, but would be very difficult to track, particularly because vessels may re-flag when participating in this fishery.	Pers. Obs./Comm.	11.7%	95

<p><b>3C.2</b> Does the system include economic/social incentives that contribute to sustainable fishing?</p>	<p>[a]The management system for the legal fishery includes stiff penalties for violations, and rewards compliant fishers with continued opportunities to gain licenses and access. Licencing procedures are considered very strong and effective in rewarding compliance in licenced companies</p>	<p>[a] Conservation Measures 118/XVII; 147/XIX; 193/XIX SGSSI Fisheries Ordinance [b] CCAMLR Conservation measures 170/XIX; Resolution 14/XIX; Resolution 15/XIX Agnew in press.</p>	<p>61.4%</p>	<p>90</p>
<p><b>60%</b> A program is being developed to promote sustainable fishing practices.</p>	<p>[b] The catch documentation system has economic incentives to reward compliance and deter trade in IUU harvested toothfish, but this is considered too new to have yet had a measurable impact</p>	<p>GSGSSI bias awards to good practice, including willingness to take part in research, but there is no formally codified or publicised system making this clear to prospective stakeholders.</p>		
<p><b>80%</b> The system has some economic and social incentives that contribute to sustainable fishing.</p>				
<p><b>100%</b> The system has established economic and social incentives that contribute to sustainable fishing. No subsidies are offered for purchase of vessels or vessels targeting fully exploited or depleted resources (by FAO definitions)</p>				

<p><b>3C.3</b> Is the system consistent with the cultural context, scale and intensity of the fishery?</p>	<p>The high-seas cultural fisheries context was historically not conservation-based. Nor were participants resident and dependent on the single resources as a diet staple. The remaining IUU fishery indicates that the “take-and-run” culture is still present in this region, although the fisheries management plan for the legal fishery is hoping to achieve, among other things, a change in culture in this relatively new fishery.</p> <p>It is considered that the system is appropriate to the size and intensity of the fishery.</p>	<p>Environmental Management Plan for South Georgia. Stakeholder response from ASOC.</p>	<p>26.8%</p>	<p>100</p>
<p><b>60%</b> Inconsistencies arise in some key areas but a programme is in place to address these.</p>				
<p><b>80%</b> The system is consistent with key elements of the cultural context, scale and intensity of the fishery.</p>				
<p><b>100%</b> The system is entirely consistent with the cultural context, scale and intensity of the fishery.</p>				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>3D The management system includes measures to achieve objectives for the target stock</i>			<b>14.3%</b>	<b>90.0</b>
<b>3D.1</b> Are the resource and effects of the fishery monitored?	<p>The fishery is closely monitored with daily catch reporting, and inspections of trans-shipments or at any port calls. Observers ensure monitoring is accurate, and add biological sampling of catches</p> <p>CCAMLR supports research surveys at regular intervals to allow fishery-independent evaluation of impact of catches on stock size and productivity. Record keeping is complete and reliable, observer reports are made available to GSGSSI.</p> <p>Licensed fishery is closely and effectively monitored on target species and by-catch.</p> <p>IUU fishing is not considered here as IUU fishers are not being considered for certification, The consequences of IUU fishing have been considered elsewhere.</p>	<p>SCOI Reports SGSSI Fisheries Ordinance. Conservation Measure 196/XIX</p> <p>Report of Working Group on Fish Stock Assessments [SC-CAMLR-XIX/4. CCAMLR website – Fisheries Monitoring and Data</p>	42.9%	100
<b>60%</b> A monitoring programme is in place which addresses some aspects of resource and effects and which can be extended.				
<b>80%</b> A monitoring programme is in place which addresses all key aspects of resource and effects at appropriate intervals and results are recorded.				
<b>100%</b> The resource and effects of the fishery are closely monitored over appropriate geographical areas and time periods. Full records are kept of monitoring results and these are made available to relevant research and management bodies.				

<p><b>3D.2</b> Are results evaluated against precautionary target and limit reference points?</p>	<p>The standard assessment model is used to set biological reference points. A Monte Carlo procedure is used to account for some uncertainty in stock status and dynamics.</p>	<p>Reports of CCAMLR Working Group on Fish Stock Assessment [SC-CAMLR-XIX/4 and others.].</p>	<p>14.3%</p>	<p>90</p>
<p><b>60%</b> Target, precautionary and limit reference points exist and some level of evaluation is possible.</p>				
<p><b>80%</b> Results of monitoring are regularly interpreted in relation to precautionary, target and limit reference points</p>	<p>It is considered that the inclusion of target reference points in the management system would contribute to sustainability of the fishery as well as being of economic benefit, Lack of targets leads to the lowered score awarded here</p>			
<p><b>100%</b> Results of monitoring are quantitatively evaluated against precautionary, target and limit reference points on a regular basis.</p>				

<p><b>3D.3</b> Do procedures exist for reductions in harvest in light of monitoring results.</p>	<p>The TAC for the legal fishery is set annually, in response to analytical assessments that use the most up to date data available. There is an effective catch monitoring system, which gives the ability to close the fishery on notice of a day or less. The system ensures that if the TAC is reduced, the catch of the legal fishery is effectively reduced. Rebuilding targets have not been set for this stock, so there are no provisions which would ensure recovery to a particular size within a specified time frame. There is instead heavy reliance on the success of the decision rule.</p>	<p>[a]CCAMLR Conservation Measure 196/XIX CCAMLR Annual Reports CAMLX XVIII and others</p>	<p>42.9%</p>	<p>80</p>
<p><b>60%</b> Practical procedures exist to reduce harvest. Programmes to link these with monitoring results are underway.</p>	<p>There is no practical procedure to reduce harvest if stock, and hence revenue, decrease such that surveillance and enforcement costs cannot be met. It is noted that no recovery plan is in place and it is considered that the management plan should include for recovery as avoidance of stock depletion cannot be guaranteed.</p>	<p>[b]Reports of CCAMLR Working Group on Fish Stock Assessment [SC-CAMLX-XIX/4 and others.]. [c] SGSSI Fishing Ordinance</p>		
<p><b>80%</b> Practical procedures exist to reduce harvest in the light of monitoring results and provide for stock recovery to specified levels.</p>				
<p><b>100%</b> Practical procedures exist to reduce harvest in light of monitoring results and provide for stock recovery to specified levels within specified time frames.</p>				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>3E The management system includes measures to achieve objectives for the affected ecosystem</i>			<b>14.3%</b>	<b>83.2</b>
<p><b>3E.1</b> Are measures in place to address (avoid or minimise) significant environmental impacts?</p> <p><b>60%</b> Significant environmental impacts are known and measures are being applied to reduce key impacts.</p> <p><b>80%</b> Environmental impacts are known. Measures are being applied to minimise all significant ones and there is evidence that the measures are working.</p>	<p>Licensed vessels are required to follow CCAMLR and GSGSSI mitigation measures to reduce seabird mortality, including a closed summer season (during breeding), night-setting, use of approved streamer lines and strategic offal discharge. As a consequence of generally good compliance, bird mortality during setting and hauling has been very low in the last two years and is currently not considered to be of conservation concern in the legal fishery.</p> <p>However, more information is required on effects of lost hooks and by IUU fishery which is assumed not to practice any mitigation measures that would reduce seabird mortality. It is noted that measures to determine hook loss in offal are being implemented and that IUU fishers may set at night to reduce observation and for</p>	<p>SC-CAMLR 1999; SC-CAMLR 2000 (para. 7.149)</p> <p>D Agnew pers comm</p>	31.1%	80

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE
<p><b>100%</b> Measures are in place to avoid all significant environmental impacts and are subject to monitoring and periodic review.</p>	<p>operational reasons.</p> <p>There is some bycatch of skates and other species in the longline fishery. Observer records indicate that these by catches are generally small. Reports of high bycatch necessitate through regulation a change in fishing grounds. This measure was previously implemented within the SGSSI maritime zone and is now a CCAMLR conservation measure. The biological basis for the measures proposed should, however, be established. This may be included in new studies of rajid by-catch. Toothfish are a major predator in the Southern Oceans. The secondary tropho-dynamic consequences of reducing the abundance of toothfish as a predator are unknown. However, in many other systems, abundance of large predatory fish have had to be reduced by a much greater amount before detectable tropho-dynamic effects have been unambiguously demonstrated. The conservative management objective should, however, result in a standing stock of toothfish large enough to play its role as a predator in the ecosystem.</p> <p>There are some gaps in knowledge on ecosystem vulnerability – for example, the impact of the by catch of rays and skates has not been tested, but is subject to new and ongoing research.</p>	<p>Observer reports and SCOI reports. Effects evaluated in Reports of Working Group on Fish Stock Assessments [ex. SC-CAMLR-XIX/4.</p>

<p><b>3E.2</b> Do fishing operations implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning or nursery areas?</p>	<p>Longline fisheries have relatively little effect on marine habitats. Based on global experience, some damage to complex biogenic structures by longlines is likely from line dragging etc. However the damage is expected to be relatively small and local at the effort levels allowed under current TACs. Trawling is specifically not allowed.</p>	<p>General descriptions of fishery in CCAMLR Commission Reports XVIII and previous.</p>	<p>10.1%</p>	<p>95</p>
<p><b>60%</b> Fishing operations use measures that significantly reduce major impacts on habitat, especially in critical or sensitive zones such as spawning or nursery areas.</p>				
<p><b>80%</b> There is evidence that fishing operations are effective in avoiding significant adverse effects on the environment, especially in critical or sensitive zones such as spawning or nursery areas.</p>				
<p><b>100%</b> There is direct evidence that fishing operations implement appropriate methods to avoid significant adverse impacts on all habitats,</p>				

<p><b>3E.3</b> Are no take zones appropriate and, if so, are these established?</p>	<p>No take zones might be appropriate, but only as part of a suite of management measures which would still feature controls on catch, effort, and gear.</p>	<p>Environmental Management Plan for South Georgia.</p>	<p>4.5%</p>	<p>90</p>
<p><b>60%</b> Suitability of no take zones has been reviewed against objective biological criteria but, if appropriate, there are no plans to implement the results.</p>	<p>Some areas of the SGSSI zone are closed to all fishing for the protection of marine mammals and seabirds and these are being monitored</p>			
<p><b>80%</b> Suitability of no take zones has been reviewed and these have been or are currently being implemented if and where appropriate.</p>	<p>No areas are closed specifically for protection of the target species, however - but to this point the need or value is not established. TAC implementation is considered sufficient on the basis of current knowledge. It is noted that the species concerned would not necessarily benefit from the establishment of no take zones. Nearshore exclusion zones have been implemented.</p>			
<p><b>100%</b> No take zones are established if and where appropriate and, if implemented, the consequences are being monitored.</p>				

<p><b>3E.4</b> Do measures include avoidance of impacts on non-target species and inadvertent impacts upon target species?</p>	<p>Licensed vessels are required to follow CCAMLR and GSGSSI mitigation measures to reduce seabird mortality, including a closed summer season (during breeding), night-setting, use of approved streamer lines, bait defrosting, appropriate line weightings, and strategic offal discharge. As a consequence of generally good compliance, bird mortality during setting and hauling has been very low in the last two years and is currently not considered to be of conservation concern. Strategies are now underway, to provide more information on the effects of lost hooks and of IUU fishery (which is assumed not to practice any mitigation measures that would reduce seabird mortality, although night setting may take place).</p> <p>Effectiveness of measures re skates and rays are not fully understood or monitored, but are the subject of an ongoing research programme.</p>	<p>SC-CAMLR 1999; SC-CAMLR 2000</p>	<p>34.4%</p>	<p>85</p>
<p><b>60%</b> Measures have been implemented that are intended to reduce the major impacts on non target species and inadvertent impacts on target species but their effectiveness is not known.</p>				
<p><b>80%</b> Measures have been implemented to reduce the major impacts on non target species and inadvertent impacts on target species and there is some evidence that they are having the desired effect.</p>				
<p><b>100%</b> Measures have been implemented to reduce the major impacts on non target species and inadvertent impacts on target species, and their effectiveness is clearly demonstrated.</p>				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE		
<p><b>3E.5</b> Do measures exist to reduce operational waste</p>	<p>There is specific concern over hook loss in discarded heads - especially given recent figures demonstrating large increases in the amounts of fishing gear associated with nests on South Georgia and cut-free entanglements - which are not considered by CCAMLR. This is now being studied by CCAMLR observers and data obtained should be analysed by CCAMLR annually.</p> <p>It is suggested that this may not be a problem for all vessels, but this is expected to be determined by ongoing studies. It is considered useful for BAS to measure any reductions in hooks in seabird nests related to measures of hook loss.</p> <p>CCAMLR conservation measures prevent use of plastic packaging bands for bait and require that any from other sources (e.g. stored food) are cut before disposal. On-board incinerators are checked as part of inspections.</p> <p>This issue is addressed by Certification Condition 7</p>	<p>Roberts, 2000</p> <p>SGSSI Fisheries Ordinance &amp; Individual Observer Reports</p>	<p>16.6%</p>	<p>75</p>
<p><b>60%</b> Measures are in place to reduce sources of operational waste that are known to have detrimental environmental consequences, but further reductions may be possible.</p>				
<p><b>80%</b> Measures are in place to reduce all sources of operational waste that are known to have detrimental environmental consequences, and there is evidence they are effective.</p>				
<p><b>100%</b> Measures are in place to reduce all sources of operational waste that are known to have detrimental environmental consequences, and there is evidence they are effective and these measures are supported by the fishers</p>				

<p><b>3E.6</b> Does the fishery employ destructive fishing practices (explosives or poisons)?</p>	<p>The fishery does not allow any destructive fishing practices. CCAMLR does not appear to have a Code of Conduct as such, but an extensive set of Conservation Measures and Rules of Procedure function in the same way that a Code of Conduct is intended to function. The fishery is prosecuted by participants from many countries, and some individual member states may have their own codes of conduct.</p>	<p>CCAMLR Scientific Committee Reports SC-CAMLR-XIX and others</p>	<p>3.5%</p>	<p>90</p>
<p><b>60%</b> The fishery does not allow any destructive fishing practices but there is concern that enforcement is inadequate to defer such practices effectively</p>				
<p><b>80%</b> The fishery does not employ any destructive fishing practices and enforcement is considered sufficient to prevent their use.</p>				
<p><b>100%</b> The fishery does not employ any destructive fishing practices. There is a code of conduct for responsible fishing that is fully supported by fishers.</p>				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>3F A research plan should be in place, in line with the management system, to address information needs</i>			<b>14.3%</b>	<b>96.7</b>
<p><b>3F.1</b> Have key research areas requiring further information been identified?</p> <p><b>60%</b> Some major areas requiring further research have been identified.</p> <p><b>80%</b> Key areas requiring further research have been identified.</p> <p><b>100%</b> A comprehensive review of information requirements has been undertaken.</p>	<p>Key research needs have been identified, and the Scientific Committee of CCAMLR regularly reviews adequacy of information and research needs.</p> <p>British Antarctic Survey conducts ecological and long-term demographic research on affected seabirds at Bird Island, South Georgia, and surveys seabirds elsewhere on South Georgia from time to time.</p> <p>CCAMLR have identified skate and ray and other benthic species of conservation issues. The CCAMLR system allows for the tabling of scientific papers on new issues which can then be addressed. Mechanisms for such measures clearly exist and are seen to be effective.</p>	<p>CCAMLR Scientific Committee Reports SC-CAMLR-XIX and others</p> <p>Latest BAS annual report</p>	33.3%	100

<p><b>3F.2</b> Is research planned/undertaken to meet the specific requirements of the management plan?</p>	<p>British Antarctic Survey conducts ecological and long-term demographic research on affected seabirds at Bird Island, South Georgia, and surveys and counts seabirds elsewhere on South Georgia from time to time.</p>	<p>Latest BAS annual report</p>	<p>33.3%</p>	<p>90</p>
<p><b>60%</b> Research is planned for highest priority information needs but significant gaps remain.</p>	<p>There is a comprehensive plan for research to fill information needs. Because of the high cost and difficult logistics of research in the southern Oceans, effective research programs often take more than one year to plan and implement. However the planning is balanced, well co-ordinated, and the results generally meet the objectives of the planned research.</p>	<p>CCAMLR Scientific Committee Reports SC-CAMLR-XIX and others</p>		
<p><b>80%</b> Research is planned and undertaken to provide necessary scientific support to the plan . There are demonstrable resources to allow implementation of the programme.</p>				
<p><b>100%</b> There is an ongoing, funded, comprehensive and balanced research programme, linking research to the management plan.</p>				

<p><b>3F.3</b> Is relevant research carried out by other organisations taken into consideration?</p>	<p>British Antarctic Survey conducts ecological and long-term demographic research on affected seabirds at Bird Island, South Georgia, and surveys and counts seabirds elsewhere on South Georgia from time to time.</p>	<p>Latest BAS ann rep</p>	<p>33.3%</p>	<p>100</p>
<p><b>60%</b> The management system is aware of research carried out by other organisations. These are not necessarily taken into consideration.</p>	<p>The logistics and geography of the southern Oceans means that almost all research is planned through CCAMLR and implemented by member states with strong co-ordination by CCAMLR. Member states do contribute all domestic research results of relevance to toothfish to CCAMLR. Assessments of this stock shows good use of knowledge from global research and management experience on large, long-lived marine species.</p>	<p>CCAMLR Science Committee Reports SC-CAMLR-XIX and others</p>		
<p><b>80%</b> Appropriate research carried out by other organisations is taken into consideration, although there is not necessarily any proactive co-ordination between organisations.</p>	<p>Research is undertaken directly or identified by members and brought to CCAMLR attention.</p>			
<p><b>100%</b> Relevant research carried out by other organisations is taken into account for management considerations. This research is often co-ordinated with existing research plans of the management system.</p>	<p>Management and research plans considered to be integrated.</p>			

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE	Weight	Score
<i>3G Control measures should be in place to ensure the management system is effectively implemented</i>			<b>14.3%</b>	<b>85.2</b>
<p><b>3G.1</b> Are information, instruction and/or training provided to fishery operatives in the aims and methods of the management system?</p> <p><b>60%</b> Mechanisms exist for the dissemination of information, instruction and training of fishery operatives. These are not necessarily implemented in terms of the aims and methods of the management system.</p> <p><b>80%</b> Information, instruction and training are provided to fishery operatives in the aims and methods of the management system allowing effective management of the system.</p> <p><b>100%</b> Information, instruction and training are provided to fishery operatives in the aims and methods of the management system allowing effective management of the fishery and operatives demonstrate comprehensive knowledge of this information.</p>	<p>Information is made available to all member states, for provision to their fisheries. Licensing requirements mean that, <i>de facto</i>, fishery operatives must familiarise themselves with the aims and methods of the management system. The requirement for 100% observer coverage on the legal fishery means that observers are providing continuing feedback to fishery operatives with regard to activities that are and are not in accord with the aims and methods of fishery management.</p> <p>There is evidence, however, that all fishers are not fully aware of the aims and methods of the system. There is no systematic training programme in place, although individual vessels or countries fishing in the area may have their own training programs. The lack of continuity of these programs limits their value.</p>	<p>SGSSI Fishery Ordinances. Observer and SCOI Reports. Observer interviews.</p>	7.9%	80

<p><b>3G.2</b> Is surveillance and monitoring in place to ensure that requirements of the management system are complied with?</p>	<p>The licensed fishery has surveillance and monitoring procedures that provide high levels of compliance with the management plan, including conservation measures.</p>	<p>a) CCAMLR Reports of SCOI, SGSSI Fishery Ordinance</p>	<p>29.7%</p>	<p>75</p>
<p><b>60%</b> An enforcement system has been implemented, however, its effectiveness and/or compliance pose a risk of failing to achieve conservation objectives.</p>	<p>[a]An effective enforcement and surveillance system at sea has been implemented. The extent of IUU fishing has now been much better estimated.</p>	<p>[b] CCAMLR Conservation Measures 170/XIX; Resolution 14/XIX; Agnew in press</p>		
<p><b>80%</b> An effective enforcement system has been implemented and there is an appropriate degree of control and compliance.</p>	<p>It is recognised however that the fishery within 48.3 is subject to changing circumstances outside 48.3 (e.g. related to the degree of surveillance at other locations). An ongoing demonstrated ability to maintain IUU surveillance and control at least at current levels is therefore considered essential.</p>			
<p><b>100%</b> An effective enforcement system has been implemented and there is a high degree of control and compliance.</p>	<p>[b] The at-sea enforcement has been augmented by a catch documentation system for products in trade. The system is likely to increase effectiveness of total enforcement. It was carefully designed to be consistent with international trade regulations, but remains too new to be evaluated.</p>			
	<p>These issues are addressed by Certification Conditions 2 and 6.</p>			

<p><b>3G.3</b> Can corrective actions be applied in the event of non-compliance?</p>	<p>Strong and effective penalties can be levied for violations of fisheries regulations, including seizure of vessels and/or gear and fines. Recent penalties assessed by courts indicate judicial willingness to exercise the full extent of the law.</p>	<p>News reports SGSSI Fishery Ordinance</p>	<p>29.7%</p>	<p>95</p>
<p><b>60%</b> Mechanisms exist or are being developed which can be implemented or applied to deal with non-compliance.</p>	<p>Enforcement of the catch documentation system is at the discretion of individual states, and the will to enforce is largely untested at this time. However, it appears that many ports are following implementation of CDC.</p>	<p>Report of Working Group on Fish Stock Assessments SC-CAMLR XIX/4</p>		
<p><b>80%</b> There are set measures that can be applied in the event of non-compliance although these may not be included in a formal or codified system.</p>	<p>For the licensed fishery, observers reporting problems can result in appropriate corrective actions. Feedback from vessels to companies on corrective actions could be improved through greater communication between CCAMLR, the management agency and vessel/licence owners.</p>			
<p><b>100%</b> Agreed and tested corrective actions can be applied in the event of non-compliance.</p>				

INDICATORS	COMMENTS	AUDIT TRACE REFERENCE		
<b>3G.4</b> Do fishery operatives assist in the collection of catch, discard and other relevant data?	Daily catch records include requirements to report catch of all species taken with fishing gear. These reports are filled out by fishery operatives. 100% observer coverage gives a high likelihood that daily catch records will be completed accurately, and observer reports indicate compliance is good. Fishery operatives deeply involved in reporting catches and by-catches. (IUU fishing is clearly excluded here as this criterion applies to the management system).	Longline Fishery Logbook Guidance Document.	7.9%	100
<b>60%</b> Fishery operatives are occasionally involved in the collection of catch, discard and other information.		SGSSI Fisheries Ordinance		
<b>80%</b> Fishery operatives are regularly involved in the collection and recording of catch, discard and other information.		Observer reports		
<b>100%</b> Fishery operatives assist significantly in the collection and recording of catch, discard and other information.				

<p><b>3G.5</b> Is the management system subject to internal review?</p>	<p>The CCAMLR system includes provisions for regular and rigorous review of the management plan and performance of the fishery. This is possible at each annual meeting.</p>	<p>CCAMLR Annual Meeting Reports CCAMLR XXVII and XVIII</p>	<p>12.5%</p>	<p>90</p>
<p><b>60%</b> There are mechanisms in place to allow for internal review.</p>	<p>Separate review mechanisms specifically for SGSSI management system are not apparent, but given the dependence of GSGSSI management on CCAMLR advice, the CCAMLR review is an effective review of GSGSSI management, CCAMLR is subject to extensive internal review which is regular, rigorous and frequent.</p>	<p>GSGSSI Ordinances</p>		
<p><b>80%</b> The management system is subject to regular internal review.</p>	<p>There is apparently no review within GSGSSI on effectiveness, although advice taken from consultants provides a <i>de facto</i> internal review. There is also internal civil service review. 1993 ordinances were updated in 2000.</p>			
<p><b>100%</b> The management system is subject to regular and frequent internal review.</p>				

<b>3G.6</b> Is the management system subject to external review?	The review of the fishery by CCAMLR ensures the	CCAMLR Annual Meeting	12.5%	75
60% There are mechanisms in place to allow for external review.	SGSSI management system is subjected to	Reports.		
80% The management system is subject to regular external review.	international review.			
100% The management system is subject to regular and frequent external review.	There are no formal provisions within CCAMLR for			
	external review.			
	GSGSSI has no external review system, but internal			
	reviews by CCAMLR (multi-national review and other			
	stakeholder representation) are considered appropriate			
	in this context.			
	These issues are addressed in Certification Conditions			
	4 and 5			

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