

THE AUSTRALIA MACKEREL ICEFISH FISHERY

Heard Island and McDonald Islands
2010 MSC Surveillance Visit Report

Certificate Number: **SCS-MFCP-F-0016**



Scientific Certification Systems
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General Information

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Surveillance Team	SCS	Sabine Daume, Ph.D. (Lead Assessor) Sandy Morison (Assessor) Chris Wilcox, Ph.D. (Assessor) Mary Lack (Assessor)
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Preface

All facts in this report were provided to SCS by Austral Fisheries Pty. Ltd. However, the interpretation, opinions, and assertions made in this report as to the compliance of the fishery with MSC requirements are the sole responsibility of Scientific Certification Systems, Inc.

General background about the fishery

The Heard Island and McDonald Islands (HIMI) Mackerel Icefish Fishery is a small fishery in Australian Antarctic waters, the subantarctic region around Heard Island and McDonald Islands, with a maximum number of vessels accessing the fishery at any one time restricted to three and an annually determined total allowable catch (TAC) that has varied between 100 and 1,800 tonnes. The fishery uses both midwater and benthic trawling. Trawl nets are limited to a minimum mesh size of 90 mm when targeting mackerel icefish to enable juvenile fish to escape the net. The minimum legal total length is 240 mm. There is a move-on rule so that, should more than 10% by number of any catch greater than 100 kg be less than the minimum size, vessels must fish at least 5 nm away from the location of that trawl for at least five days.

The HIMI Mackerel Icefish Fishery is located in waters that are not only in the Australian EEZ, but also fall under the jurisdiction of the Commission on the Conservation of Antarctic Marine Living Resources (CCAMLR). The fishery is therefore managed by the Australian Fisheries Management Authority (AFMA) in accordance with the *Fisheries Management Act 1991*, and by the Australian Antarctic Division (AAD) in accordance with the *Antarctic Marine Living Resources Conservation Act 1981* through which Australia's obligations under CCAMLR are implemented. All aspects of the fishery management system including research, surveys, stock assessments, harvest strategies and management controls are controlled by these two organizations. The HIMI Mackerel Icefish Fishery is also subject to elements of the *Environment Protection and Biodiversity Conservation Act 1999*.

Scientists of the AAD undertake stock assessments each year as part of their core work. Upon completion of assessments, findings are reviewed by the Sub Antarctic Resource Assessment Group (SARAG). The assessments are then submitted to the CCAMLR Working Group on Fish Stock Assessment (WGFSa), where they are open to international scrutiny and discussion.

WGFSa then recommends to the Commission, via the CCAMLR Scientific Committee, a TAC for CCAMLR Statistical Division 58.5.2, in which the HIMI fishery is located. Once approved by CCAMLR, TACs and other measures for the coming season are then set out in CCAMLR Conservation Measures.

CCAMLR-agreed TACs are then considered by the Sub-Antarctic Fisheries Management Advisory Committee (SouthMAC) before the AFMA Commission formally sets the TAC (at or below the level set by CCAMLR) with the fishing season subsequently commencing on 1 December.

Assessment process

General context

The HIMI Mackerel Icefish Fishery was originally certified on 31 March 2006 by Scientific Certification Systems, Inc. The requirements of the Marine Stewardship Council (MSC) are that each certified fishery must undergo, at a minimum, an annual surveillance to ensure the basis of certification is still in place and that the fishery is meeting any conditional requirements from the original certification.

An announcement of the surveillance site visit was published on the MSC website on 27th April 2010 and opportunity was provided to stakeholders to meet with or submit information on the fishery to the assessment team. No stakeholder representation or comments were received for the 4th Annual Assessment, though some stakeholders and scientists were present for the Re-Assessment meetings of the HIMI Mackerel Icefish Fishery which occurred the following day. Attendees are summarized in Table 1 of this document.

Methodology

The surveillance audit was carried out in accordance with the Marine Stewardship Council (MSC) Fisheries Certification Methodology (FCM) Version 6. Should a fishery fail the surveillance audit, and cannot address identified deficiencies in a reasonable period of time, then the use of the certificate and the MSC logo can be revoked by the certifier.

The issues for the certifier are whether the fishery has sufficiently acted on the required conditions set forth in the original certification report, and whether a random check on the performance of the fishery verifies continued compliance with the MSC standards.

The annual surveillance audit process is comprised of four general parts:

1. The certification body provides questions around areas of inquiry to determine if the fishery is maintaining the level of management observed during the original certification. In addition, the surveillance team requires that the client provide evidence that the fishery management system has taken the necessary actions to meet all conditions placed on the fishery during the initial certification assessment or any previous surveillance audits.
2. The surveillance/assessment team meets with the client fishery to allow the client to present the information gathered in answer to the questions asked by the surveillance team. The surveillance team can then ask questions about the information provided to ensure its full understanding of how well the fishery management system is functioning and if the fishery management system is continuing to meet the MSC standards.
3. The surveillance team presents its findings to the client fishery at the end of the site visit. The results outline the assessment team's understanding of the information

presented and its conclusion regarding the fishery management system's continued compliance with MSC standards. Where indicated, the surveillance team may provide the client fishery with additional time to supplement the information provided if the surveillance team finds that there are still issues requiring clarification.

4. Where appropriate, the client fishery submits final information to the surveillance/assessment team for consideration in the surveillance findings and report. The surveillance team then reviews the final information and submits a final report to the client fishery and the MSC for posting on the MSC website. If there are continued compliance concerns, these are presented as non-conformances that require further action and audits as specified in the surveillance report.

Surveillance Team

A new assessment team was introduced for the 4th annual surveillance audit. The same team also started the re-assessment of the fishery this year under the Default assessment tree of the new Fisheries Assessment Methodology (FAM v.2, 2009). As outlined below the combined expertise of the team members covers each aspect of the 3 MSC principles. In addition and to fulfill the requirements of the Fisheries Certification Methodology (section 6.3) team members are clearly experienced and comparably qualified to the original assessment team.

Dr. Sabine Daume, Scientific Certification Systems

Dr Daume led the audit. Sabine is responsible for leading SCS's Sustainable Seafood Certification program, which includes both fishery and chain of custody certification under the auspices of the Marine Stewardship Council (MSC), using the MSC methodology and standards. Dr. Daume has been involved and/ or lead numerous pre and full assessments, including the West Australia Rock Lobster fishery, Mexican Spiny Rock Lobster Fishery, Mexican Sardine fishery, Australian Icefish fishery, the Australian Lakes & Coroong fishery and the North Pacific Halibut fishery and the North Pacific Sablefish (Black Cod) fishery. Dr. Daume is a marine biologist with special expertise in the biology and ecology of exploited marine resources. She has over 10 years experience working closely with the fishing and aquaculture industry in Australia. In her role as the Senior Research Scientist at the Department of Fisheries in Western Australia, she lead research projects related to fishery and fisheries habitats of temperate and tropical invertebrate species.

Alexander "Sandy" Morison, Consultant, Morison Aquatic Sciences

Sandy was the Principle 1 expert for this audit. He is a consultant for Morison Aquatic Sciences, a private consulting firm specializing in fisheries and aquatic sciences. Sandy has over 10 years experience in senior research positions for state and national organizations in Australia and over 25 years experience working in fishery science and assessment at state, national and international levels. This includes commercial and recreational fisheries in freshwater, estuarine and marine habitats. He has chaired a wide range fishery assessment groups ranging from small inshore fisheries to large

multinational offshore fisheries and has experience with invertebrate, chondrichthyan and teleost fisheries. He has particular expertise with fish age and growth and has been involved in the development and implementation of harvest strategies for several fisheries. Sandy has participated as part of a team undertaking Marine Stewardship Council pre-assessment for Australian Commonwealth-managed fisheries.

Dr. Chris Wilcox, Senior Research Scientist CSIRO

Dr Wilcox was responsible for Principle 2. He leads a team working on the spatial ecology of pelagic fisheries, and has worked extensively on fisheries bycatch issues in Australia. Chris holds a PhD in ecology and conservation biology from the University of California. His research focus has been on the dynamics of exploited systems, and the design of policy tools to increase the sustainability of human activities. Historically his work has covered a wide array of topics including population dynamics, animal movement, modeling of species distributions, ecological community structure, predator prey dynamics, marine reserve design and management, and development of environmental policy.

Mary Lack, Consultant, Shellack Pty Ltd:

Mary was the Principle 3 expert for this audit. She has qualifications in agricultural and resource economics and has over 25 years experience in Australian and international fisheries management. She has been the Director of Shellack Pty Ltd, a consulting company, based in Canberra Australia, specializing in fisheries management and trade and working with government, non-government and intergovernmental organizations for the past 10 years. Prior to that Mary worked in various senior fisheries management roles in the Australian Government. During that time she has developed strong skills in fisheries management, domestic and international fisheries governance and fisheries trade analysis. In recent years her work has focused on sustainability and governance issues in Australian fisheries and in regional fisheries management organizations. Mary has also worked extensively on analyses of illegal, unreported and unregulated (IUU) fishing. Mary has recent experience in MSC assessments having been involved in pre-assessments of a number of Australian fisheries.

Surveillance Meetings

The surveillance audit for 2010 comprised:

1. An exchange of information indicating to the client the areas of inquiry by SCS for the surveillance audit.
2. A meeting on the 24 May 2010 in Hobart, Tasmania, Australia was conducted with Martin Exel of Austral Fisheries Pty. Ltd. Meetings with research and management personnel were conducted on the 25th of May 2010. The discussion included a review of ongoing activities associated with the Conditions placed on the fishery.
3. Necessary documents were sent by the client to SCS prior and after the meeting in May 2010.

Table 1: 4th Annual Assessment Meeting Attendees and Organizations

4th Annual Assessment Meeting Attendees	Organization	Method of Presence
Dr. Sabine Daume	SCS	In-person
Mary Lack	SCS	In-person
Sandy Morison	SCS	In-person
Dr. Chris Wilcox	SCS	In-person
Martin Exel	Austral Ltd Pty	In-person
Dr. Dirk Welsford	AAD	In-person
Dr. Malcolm Haddon	CSIRO	In-person
Peter Trott	WWF	In-person
Dennis Snowden	AFMA	Conference line
Trysh Stone	AFMA	Conference line
Matt Daniel	AFMA	Conference line
Dr. Ross Daley	CSIRO	In-person
Dr. Cathy Bulman	CSIRO	In-person

Results

General discussion

This is the 4th Annual Surveillance Report (2010) prepared by SCS to meet the requirements of the MSC for annual audits of certified fisheries.

It is SCS's view that Australia's Heard Island and McDonald Islands Mackerel Icefish Fishery continues to meet the standards of the MSC and comply with the 'Requirements for Continued Certification.' SCS recommends the continued use of the MSC certificate through to the Reassessment audit with no additional corrective action requests other than those from the original assessment.

The section below provides the general information about the status of the stock, the ecosystem impacts from fishing, and management arrangements for this reporting period.

Following, in tabulated format, are the original assessment scoring guideposts and scoring commentary for each condition. The score and requirements for each original condition are sets out below. The conditions identify the areas in which the fishery was determined to perform below the level required by the MSC standard during the initial assessment. The Action Plan produced by the client, outlining the stages involved in addressing the conditions raised, follows below for each original condition.

According to the terms of the Action Plan, the client has provided the following information on the work undertaken since the last Surveillance Audit in 2009:

AFMA. 2009a. Residual risk assessment of the level 2 ecological risk assessment species results: report for the Heard Island and McDonald Islands demersal trawl sub-

- fishery. Australian Fisheries Management Authority. July 2009. Canberra, Australia.
- AFMA. 2009b. Annual Status Report, Heard Island and Mc Donald Islands Fishery. Australian Fisheries Management Authority. July 2009. Canberra, Australia.
- AFMA. 2009c. Ecological risk management report for the Heard Island and McDonald Islands Fishery, demersal trawl sub-fishery. Australian Fisheries Management Authority. December 2009. Canberra, Australia.
- AFMA. 2009d. Ecological risk management report for the Heard Island and Mc Donald Islands Fishery, midwater trawl sub-fishery. Australian Fisheries Management Authority. December 2009. Canberra, Australia.
- AFMA. 2009e. Management Advisory Committees. [*Fisheries Management Paper No. 1*](#). Australian Fisheries Management Authority. June 2009. Canberra, Australia.
- AFMA. 2009f. Residual risk assessment of the level 2 ecological risk assessment species results: report for the Heard Island and McDonald midwater trawl sub-fishery. July 2009. Australian Fisheries Management Authority. Canberra, Australia.
- CCAMLR. 2008. [*Fishery Report: *Chamsocephalus gunnari* Heard Island \(Division 58.5.2\)*](#). Convention on the Conservation of Antarctic Marine Living Resources. Kingston, Tasmania, Australia.
- CCAMLR. 2009a. [*Report of the Twenty-Eight Meeting, Hobart, Australia, 26 October – 6 November, 2009*](#). Convention on the Conservation of Antarctic Marine Living Resources.
- CCAMLR. 2009b. Report on the key outcomes of the twenty-eighth meeting of the Commission for the Conservation of Antarctic Marine Living Resources. Convention on the Conservation of Antarctic Marine Living Resources XXVIII Attachment A. 26 Oct—6 Nov 2009. Kingston, Tasmania, Australia.
- Daley R, Bulman C, Stevenson D, Hobday A, Sporcic M, and Fuller M. 2007. Ecological risk assessment for the effects of fishing: report for the demersal trawl sub-fishery of the Heard and McDonald Islands fishery. Report for the Australian Fisheries Management Authority, Canberra, Australia.
- Duhamel G and Hautecoeur M. 2009. Biomass, abundance and distribution of fish in the Kerguelen Island EEZ (CCAMLR statistical division 58.5.1). Convention on the Conservation of Antarctic Marine Living Resources Science. 16:1-32.
- Gunn J. 2009. Demersal fishing interactions with marine benthos in the Australian EEZ of the Southern Ocean: an assessment of the vulnerability of benthic habitats to damage by demersal gears. Progress report to the project advisory committee. December 2009.
- Hibberd T. 2009. Accuracy of benthic invertebrate by-catch identification by observers operating in the Heard Island and McDonald Islands Patagonian toothfish longline fishery. Australian Antarctic Division, Department of the Environment, Water, Heritage and the Arts. Kingston, Tasmania, Australia.
- Meyer L, Constable A, Williams R. 2000. Conservation of marine habitats in the region of Heard Island and McDonald Islands. Final report on stage 1 to Environment Australia. Australian Antarctic Division. Kingston, Tasmania, Australia.: 1-80.
- Nowara GB. 2009. Report on a random stratified trawl survey to estimate distribution and abundance of *Dissostichus eleginoides* and *Chamsocephalus gunnari* in the Heard Island region (division 58.5.2) for 2008 and 2009. Australia Antarctic Division,

Department of the Environment, Water, Heritage and the Arts. Kingston, Tasmania, Australia.

- Nowara GB, Welsford DC, Lamb T, Gasco N, Pruvost P, Duhamel G. 2009. Distribution and abundance of skates on the Kerguelen Plateau (CCAMLR division 58.5.1 and 58.5.2). Australian Government Antarctic Division. Kingston, Tasmania, Australia. WG-FSA-09/43. Agenda Item No 6.2.
- Program Concarneau 2010. The Kerguelen Plateau, Marine ecosystem and fisheries. 1st International Science Symposium on the Kerguelen Plateau in Concarneau, France, 14-16 April 2010.
- SARAG. 2009. Minutes. 25 March 2009. Sub-Antarctic Resource group. SARAG 34: 1-9.
- SARAG. 2009. Minutes. 21 September 2009. Sub-Antarctic Resource group. SARAG 36: 1-8.
- SARAG. 2009. Minutes. 23 November 2009. Sub-Antarctic Resource group. SARAG 37: 1-9.
- SARAG. 2010. Minutes. 16 March 2010. Sub-Antarctic Resource group. SARAG 38: 1-10.
- SouthMAC.2009. [Sub-Antarctic Fisheries Management Advisory Committee \(SouthMAC\) Minutes, SouthMAC 28, 25 November 2009.](#)
- Welsford D. 2009. Preliminary Assessment of Mackerel Icefish, *Champsocephalus gunnari*, in the vicinity of Heard Island and McDonald Island (Division 58.5.2) based on a survey in April 2009, using the generalized yield model. Department of the Environment, Water, Heritage and the Arts. Australian Antarctic Division, Kingston, Tasmania, Australia.
- Zhou S, Fuller M, Smith T. 2009. Rapid quantitative risk assessment for fish species in seven Commonwealth fisheries. Australian Fisheries Management Authority. Canberra, Australia. Chapter 8: 49-106.

This progress has been evaluated by SCS in terms of the intent of the original conditions and the original scoring indicator, guideposts and commentary as well as the commitments made in the Action Plan.

When the Condition has been judged to have been met, a re-evaluation of the scoring allocated to the relevant Performance Indicator(s) in the original MSC assessment has been included within the report.

Stock Status

The monitoring and assessment to determine the status of the stock are still being conducted consistent with what was provided to the assessment team in the original assessment and the status of the stock remains consistent with pre-determined reference points.

The indicators in the original assessment that cover monitoring were 1.1.2.1, and 1.1.2.2, 1.1.2.3, 1.1.2.4, 1.1.2.6, 1.1.2.8, and 1.3.1. The performance indicators associated with

understanding the status of the stock were 1.1.3.1, 1.1.3.2, 1.1.4.1, 1.1.4.2, 1.1.5.1, and 1.1.5.2. The performance indicator associated with assessing the harvest strategy was 1.1.6.1 (see below).

The catch limit for mackerel icefish in Division 58.5.2 was reassessed, and a TAC of 1658 tonnes was agreed for recommendation for the 2009/10 fishing season (**Table 2**). As seen in the survey in 2008, younger cohorts are present at low densities, and are contributing just under 2% of the surveyed biomass combined (Welsford 2009). There is no evidence of any substantial 1+ recruitment resulting from spawning activity by the 4+ cohort present in 2008, with very low densities of fish below 20 cm. According to Welsford (2009) this result and prior observations indicate that the population and the fishery will be dominated by the fully recruited 3+ cohort for the next season. This cohort is now mature, and a cohort resulting from spawning activity may be detected in the 2009/10 survey.

As it was anticipated in 2008, catches of *C. gunnari* in 2009 were 4 times above the 3 year average of 1.7 t, and also 5 times above the 2008 catch (Nowara, 2009).

Table 2: TAC for Heard Island and McDonald Islands 2008/2009 and 2009/2010.

	2009/2010 TAC (tonnes)	2008/2009 TAC (tonnes)
Target species		
Patagonian toothfish	2,550	2,500
Mackerel icefish	1,658	102
By-catch species		
Skates and Rays	120	120
<i>Macrourus</i> spp.	360	360
Unicorn icefish	150	150
Grey rockcod	80	80
Each other species	50	50

Source: AFMA (2009)

The approach used to set TACs for mackerel icefish satisfies the agreed decision rules which aim to keep the biomass of the stock greater than or equal to 75% of that which would have been present in the absence of fishing.

Based on the evidence presented, SCS is satisfied that the same level of work, or greater, is still occurring with regard to understanding the status of the stock and setting appropriate harvest limits.

Ecosystem Impacts from Fishing

The fishery management system is still functioning to keep ecosystem based impacts from fishing at acceptable levels.

The indicators in the original assessment that cover ecosystem impacts were 2.1.1.1, 2.1.1.2, 2.1.2.1, 2.1.2.2, 2.1.3.1, 2.1.3.2, 2.1.3.3, 2.1.5.1, 2.1.5.2, 2.1.5.3, 2.2.1.1, 2.2.1.2, 2.2.2.1, 2.2.3.1, 2.2.5.1, and 2.2.5.2 (see below).

Based on the evidence presented, SCS is satisfied that the same level of work, or greater, is still occurring with regard to understanding and managing for acceptable levels of impact in the Australian Mackerel Icefish fishery.

Ecological Risk Assessments were undertaken for the HIMI fishery and reports have been finalized (Daley et al. 2007, AFMA 2009 a,b, f). SARAG considered the level 2 ERA results and the residual risk assessment for each sub-fishery. A rapid level three residual risk assessment was completed for the sub Antarctic fisheries by CSIRO (Zhou et al, 2009). SouthMAC will consider the results in deliberations about ecological risk management requirements.

ERA summary

Ecological risk assessments have been conducted for both the demersal and midwater components of the fishery. The risk assessment process includes up to 5 steps depending on evidence for risk:

- 1.) An initial scoping step, a qualitative analysis to determine species that were affected (level 1),
- 2.) A semi quantitative step to determine whether the effects were likely to represent a risk (level 2),
- 3.) A reanalysis of the semi-quantitative analysis considering current management responses,
- 4.) Then a quantitative analysis to estimate risk.

As a complement to this process, AFMA developed risk management plans that outline the responses underway or to be taken to address the identified risks. In the icefish fishery risk assessments proceeded from scoping through level 2, with reassessment based on management actions. Independently, a level 3 analysis using the SAFE method (Zhou et al. 2009) was undertaken. AFMA prepared a risk management plan based on the scoping through level 2 analysis (AFMA 2009 c, d).

Level 2 risk assessment found 17 species (of 106 considered) at high risk in the midwater trawl. Reconsideration including management measures (step 4 above) reduced the number of high risk species in the midwater trawl sector 1 species (porbeagle shark). This reduction was based on the use of bycatch limits of 50 tonnes for each species, along with move on provisions for high bycatch areas, lack of bottom contact by the gear, and seabird bycatch reduction measures. The level 2 risk assessment for the demersal fishery included both the icefish and toothfish fisheries. This assessment identified 52 species as high risk, of which three species, all skates, remained after management measures were considered (step 4 above).

The level 3 risk assessment for the icefish fishery again includes icefish in the midwater sector, and lumps toothfish and icefish in the demersal sector. The demersal assessment included 61 non-target species. Three species of skates came up with fishing mortalities that could be of concern. The midwater sector assessment covered 22 non-target species, non of which were identified as being of concern and warranting further investigation.

Bycatch

Bycatch limits are still in effect in the icefish fishery. The Statutory Fishing Rights requires specific bycatch limits be enforced for all gear types combined (see Table 1).

The catches of skates species in 2009 estimated by the random stratified trawl surveys for both toothfish and icefish are double those in 2008 and also twice the 3 year average for *B. eatonii* and *B. irrasa*. Catches are similar for *B. murrayi* to the 3 year average catches (Nowara, 2009).

Benthic Impacts

The FRDC (Fisheries Research and Development Corporation) funded project on 'Demersal fishing interactions with marine benthos in the Australian EEZ of the Southern Ocean: an assessment of the vulnerability of benthic habitats to damage by demersal gears' is progressing on schedule and all milestones have been met. A progress report for this project was provided to SCS (Gunn 2009).

Food web interactions

Studies are underway by CCAMLR and AFMA/AAD investigating food web interactions in the fishery. A series of papers were presented at the 1st International Science Symposium on the Kerguelen Plateau in Concarneau, France, 14-16 April 2010 (Program Concarneau 2010). However, formal publications are not expected to be available before the end of the year.

Management

The HIMI Mackerel Icefish Fishery continues to be conducted in accordance with local, national and international laws and standards. The institutional and operational frameworks in which the management system operates are consistent with the responsible and sustainable use of the resource.

The indicators in the original assessment that cover the management framework were 3.1.1.1 and 3.1.1.2, 3.1.2.2 and 3.1.2.3, 3.1.3.1 and 3.1.3.2, 3.1.4.1-3.1.4.3. Management measures were assessed against indicators 3.2.1.1-3.2.1.10, 3.2.2.1 – 3.2.2.4 and 3.2.3.1. Operation of the fishery was assessed against indicators 3.3.1.1, 3.3.1.2, 3.3.2.1-3.3.2.4, 3.3.3.1 and 3.3.3.2. The monitoring and performance evaluation framework was assessed against 3.4.1.1, 3.4.1.2, 3.4.2.1, 3.4.2.2 and 3.4.3.1-3.4.3.3.

The only significant change in the institutional framework for the fishery since the last surveillance audit has been that, from 1 July 2009, AFMA operates as a commission rather than as a statutory authority. This change has not materially affected AFMA's responsibilities or day-to-day operations in respect of the HIMI Mackerel Icefish Fishery.

Some changes are being made to the main legislative instrument for management of the fishery, the *Heard Island and McDonald Islands Fishery Management Plan 2002*, in order to update some aspects of the Plan and to allow for an increased number of vessels to operate under the Plan. The number of trawl vessels, the gear used to target mackerel icefish, will however, remain capped at three. The Cost Recovery Impact Statement (CRIS), which attributes management costs between industry and Government, is also under review and the outcomes of this review will need to be considered in the context of indicator 3.2.1.5 when the revised CRIS is available.

SCS was provided with progress reports in relation to the research work on benthic impacts, required under Indicator 3.2.1.7, and is satisfied that this work is being progressed despite being unavoidably delayed by around 12 months. Work on the ecosystem model is yet to be completed. This has been discussed under Ecosystem Impacts above.

Based on the evidence presented, SCS is satisfied that the Fishery continues to meet the requirements of MSC Principle 3 to a high standard and that work to address outstanding issues is progressing satisfactorily.

Conclusions and recommendations

It is SCS's view that the HIMI Mackerel Icefish fishery continues to meet the standards of the MSC and complies with the 'Requirements for Continued Certification'.

SCS finds that the progress being made on meeting conditions in the HIMI Mackerel Icefish fishery is adequate. However, several of the conditions remain open and will be addressed in the reassessment of the fishery (**Table 3**). All but one outstanding condition related to the development of an ecosystem model which has not been completed yet (see below). This judgment was made in accordance with the FCM6.7.4 and TAB D-013, that the factors which prevented the fishery client from meeting the condition has not been in control of the fishery client. The Australian Antarctic Division is in charge of developing this model.

The reassessment of the HIMI Mackerel Icefish fishery will be undertaken using the default assessment tree with the Performance indicators (PI) and Scoring guideposts (SGs) of the new Fishery Assessment Methodology - FAM v2 (2009). All aspects of any conditions that remain open will be specifically addressed and examined against the new SGs. However, there will not necessarily be a direct correspondence between these outstanding conditions and new ones from the reassessment. Where direct correspondence to new conditions is impossible this will be explicitly explained.

In summary, 8 conditions relating to Principle 1 remain open and 1 condition in each of Principle 2 and 3 are still open. Five conditions in Principle 2, 2 conditions in Principle 1 and 1 condition in Principle 3 were closed and rescored by the assessment team.

Table 3: Summary of Condition status and mapping of outstanding issue to Performance Indicators (PIs) of the new Fishery Assessment Methodology - FAM v2 (2009) used for the reassessment of the fishery.

Condition	Indicator	Status of Condition	PI of new FAM v2
1	1.1	Closed	N.A.
2	1.2	Open – On Target, ecological model and Management Strategy Evaluation (MSE) behind target.	1.2.3
3	1.3	Open – On Target, ecological model and MSE behind target.	1.1.2
4	1.4	Open – On Target, ecological model and MSE behind target.	1.2.4
5	1.5	Open – On Target, ecological model and MSE behind target.	1.2.4
6	1.6	Open – On Target, ecological model and MSE behind target.	1.1.1
7	1.7	Open – On Target, ecological model and MSE behind target.	1.1.1
8	1.8	Open – On Target, ecological model and MSE behind target.	1.2.2
9	1.9	Closed	N.A.
10	1.10	Open – On Target, ecological model and MSE behind target.	1.1.1
11	2.1	Closed	N.A.
12	2.2	Closed	N.A.
13	2.3	Closed	N.A.
14	2.4	Closed	N.A.
15	2.5	Open – On Target, food web studies behind target.	2.5.3
16	2.6	Closed	N.A.
17	3.1	Open – On Target, Management Strategy Evaluation (MSE) behind target.	1.2.2
18	3.2	Closed	N.A.

Principle 1 - Status of Previously Raised Conditions

1.1.1.3		
The stock units are well defined for the purposes of conservation, fisheries management and stock assessment.		
SG 60	SG 80	SG 100
Stock units have been defined.	The stock units are well defined. Stock units have been shown to be precautionary for the purposes of conservation, fisheries management and stock assessment.	There is an unambiguous description of each stock unit, including its geographic location.

Revised Score: 80

Condition 1.1: The client should provide evidence to the certification body contracted for surveillance reports that the current stock designations used for the icefish assessments are the best choice for conservation and more precautionary than alternative stock designations. One approach might be a re-assessment under the alternative assumption that there is a single stock for the Indian Ocean region. This could be used to demonstrate that the management strategies that are currently used under the assumption of separate stocks are robust and ultimately more precautionary than alternative assumptions regarding stock structure. Other approaches may also be used, such as evidence from studies designed to further elucidate stock structure/distribution.

Client Action Plan: Austral, on behalf of the HIMI industry, to provide copies of papers, and organize meeting/communication between the certification body for surveillance reports and AAD scientists, to demonstrate that current stock designations for icefish are both more precautionary than alternative designations, and are the best choice for conservation and management of the stocks.

Deadline: December 2007

Progress on Condition 1.1:

The additional paper that was proposed as providing more insight into the stock structure of mackerel icefish (Duhamel and Hautecoeur 2010) has been published and was considered by the assessment team. This paper describes the results of a fishery-independent survey of stocks of fish stocks including *C. gunnari* in the northern part of the Kerguelen Plateau from September to October 2006. In this survey *C. gunnari* was found in shallow waters (<500 m), east of the Kerguelen Islands, with few concentrations in the northern and northeastern limit of the 200 m isobaths. The length-frequency distributions show distinct modes, which are believed to correspond to separate cohorts (age classes), but the distribution of these cohorts was not homogenous within the

surveyed area. The differences in the relative abundance of age classes among areas of the northern part of the Kerguelen Plateau are evidence that these populations comprise separate stocks, but this conclusion is not explicitly drawn by the authors.

The study, therefore, does not directly address the issue of stock structure for *C. gunnari* across the whole of the Kerguelen Plateau but its results confirm the observations from the Australian EEZ that recruitment patterns vary among populations of *C. gunnari* on the Kerguelen Plateau that are separated by a few degrees of latitude or longitude. If combined with the results of the Australian fishery-independent survey undertaken in the same year, it would allow a comparison of the observed length-frequency distributions and inferred year-class strengths from the Australian and French EEZs. This would broaden the comparisons already made from surveys within the Australian EEZ and may strengthen the conclusions drawn from such comparisons that the discrete populations constitute separate stocks from a fishery perspective.

There is yet to be a formal evaluation of the impact on assessment outcomes of other stock structure hypotheses. There is no fishing, however, for Mackerel icefish in any other areas on the Kerguelen Plateau that might reasonably be considered to form part of the same stock so the current approach is highly likely to be sufficiently precautionary. Therefore, additional work to explore the implications of other stock structure hypotheses is now considered unnecessary. If fishing were to commence in other areas the scoring would need to be revisited. Consequently, the information provided is now considered sufficient to regard the stock units as being well defined and that the stock structure hypotheses used in the assessment are appropriate. This is sufficient for achieving a score of 80 on this SG and the condition is therefore considered to be closed.

Status of Condition 1.1: Closed

1.1.2.8		
There is knowledge of environmental influences on stock dynamics.		
SG 60	SG 80	SG 100
Impacts of inter-annual variability in environmental conditions on distribution and availability of fish have been studied.	Impacts of inter-annual variability on stock abundance have been studied and are taken into account in the assessment. Impacts on distribution and availability of fish have been studied and inform the stock assessment process.	Impacts of regime shifts and inter-annual variability in environmental conditions are well understood and incorporated in the assessments.

Score: 79

Condition 1.2: The client should provide evidence that the fishery assessments meet the first bullet point under the 80 scoring guidepost – “Impacts of inter-annual variability on stock abundance have been studied and are taken into account in the assessment”. For example, analyses could be provided that show how the fishery assessments factor in uncertainty in growth, mortality, size at first maturity and fecundity, and the influence of the environment on these variables.

Client Action Plan: A variety of activities by the managing authorities, and with participation by the client, are underway that specifically address this condition.

Specifically, the client will provide to the certification body the finalised ecosystem model currently under development as part of the HIMI Marine ecosystem study undertaken by AAD in 2004.

This model will be used to explore the dynamics of mackerel icefish and its role in the foodwebs of the region. It will also be used to evaluate management strategies for icefish with the aim being to determine an alternative, ecologically sustainable, management strategy.

Such a strategy will identify reference points, assessment methods (including indicators) and harvest rules based on outcomes.

Deadline: A number of relevant reports will be provided along the way to a final completion date of December 2010.

The progress reports are:

1. Annual reports of the AFMA Sub-Antarctic Resources Assessment Group (SARAG)
2. CCAMLR paper (estimated to be available November 2008)
3. SARAG final report estimated to be available by September 2009

The client will provide copies of each study within 30 days of its completion.

If further clarification is requested by the certification body, the client will facilitate a meeting between the certification body, the client, and the management authorities to discuss the outcomes and implications of these studies.

Also, if the planned studies are not going to be completed on time, the client will advise the certification body as to any additional time required. The client notes that it does not have control over the estimated timeframes for completion of the identified work, and can only be responsible for submitting the work upon its completion.

Progress on Condition 1.2:

CCAMLR stock assessment reports continue to be provided annually. These reports, and the minutes of the regular SARAG meetings, demonstrate that the assessment of the fishery takes into account the inter-annual variability in stock abundance that is measured by the annual fishery-independent surveys.

The Client Action Plan describes the development of an ecosystem model and its use for a range of purposes including identifying reference points, assessment methods, harvest rules and evaluating management strategies. The activities are still being undertaken but the timelines for completing them have had to be extended and the work will not be completed in 2010 and may not be completed in 2011. Verbal reports from AAD indicated that the project is regarded as being on track, albeit under a revised timeline with no specific completion date.

There have not been any analyses provided that show how the assessment factors in uncertainty in growth, mortality, size at first maturity and fecundity, and the influence of the environment on these variables, as was required in the condition. Nevertheless,

factors such as fecundity and environment are factored into the assessment as their influence is directly measured by the annual surveys, even if the causal links are not well understood. Potential variability in growth, mortality and size at first maturity, however, are still considered to be potentially important uncertainties in the assessment.

SCS’s determination is that there has not yet been sufficient progress on this condition to allow it to be closed and that the remaining aspects of this condition would be re-examined during the full reassessment of the fishery using the revised PISGs specified in the latest FAMv2 (2009). The assessment team will expect a timeline and completion date for the ecosystem modeling work in the client action plan of the new condition.

Status of Condition 1.2: Open – on target however the ecosystem model and Management Strategy Evaluation (MSE) is behind target and will not be completed before the end of this certification (31 March 2011).

1.1.3.1		
Limit Reference Points (LRPs) or operational equivalents have been set.		
SG 60	SG 80	SG 100
LRPs for target stocks have been chosen and are justified based on standard international practice.	LRPs for target stocks are justified based on stock biology and take into account available knowledge of fishery impacts on non-target species and the ecosystem.	LRPs for target stocks are justified based on biology, uncertainty, variability, data limitations, knowledge of ecosystem impacts, and statistical simulations of these factors.

Score: 75

Condition 1.3: The client should provide evidence that a comprehensive review has been or is being undertaken regarding appropriate Limit Reference Points for the icefish fishery. Evidence should be provided that the LRPs used meet the AFMA requirements (are appropriate for maintaining both ecologically viable stocks of the target species and an ecologically sustainable fishery), are appropriate for the biology of the icefish stock and takes into account available knowledge of fishery impacts on non-target species and the ecosystem, and ensure with high probability that the spawning biomass of the icefish stock does not fall below a specified minimum level and that fishing mortality does not exceed a specified maximum level. The results of this review should be published.

Client Action Plan: The client will, as under Condition 1.2, deliver to the certification body the results of work being conducted by the managing authorities to develop a new model that incorporates ecosystem functions more fully into the assessment of icefish. In addition, the client will provide the results of the Management Strategy Evaluation work that will result from using the model to demonstrate the applicability of the chosen Limit Reference Points being used for ecologically sustainable management of the icefish fishery in the HIMI region.

Deadline: Same as for Condition 1.2

Progress on Condition 1.3: As indicated in the previous Condition for 1.1.2.8, the work being conducted by AAD scientists in conjunction with CCAMLR and AFMA is set to review stock dynamics, including food web interactions and then review and, where necessary, revise harvest control rules.

As indicated under the progress for Condition 1.2 the timelines for completing the proposed work have had to be extended but verbal reports from AAD indicated that the project is regarded as being on track under a revised timeline, but will not be completed by the end of 2010.

SCS’s determination is that there has not yet been sufficient progress on this condition to allow it to be closed and that the requirements specified in Condition 1.3 would be re-examined during the full re-assessment of the fishery using the revised PISGs specified in the latest FAM v. 2 (2009).

Status of Condition 1.3: Open – as Condition 1.2

1.1.3.2		
Target Reference Points (TRPs) or operational equivalents have been set.		
SG 60	SG 80	SG 100
TRPs for target stocks have been chosen and are justified based on standard international practice.	TRPs for target stocks are justified based on stock biology and take into account available knowledge of fishery impacts on non-target species and the ecosystem.	TRPs for target stocks are justified based on biology, uncertainty, variability, data limitations, knowledge of ecosystem impacts, and statistical simulations of these factors.

Score: 75

Condition 1.4:

1. A review should be provided about what target reference points, which are based on the biology of the icefish stock and take into account available knowledge of fishery impacts on non-target species and the ecosystem, should be specified for the icefish fishery. The analysis should examine how target reference points considered are more precautionary than the corresponding limit reference points and how they ensure with high probability that the spawning biomass of the icefish stock does not fall below a specified minimum level and that fishing mortality does not exceed a specified maximum level.
2. The review provided should discuss how the target reference points used or proposed for use by AFMA for the icefish fishery compare with those specified or applied by CCAMLR.

Client Action Plan:

1. The review required will be provided through the MSE work being undertaken, as outlined in Conditions 1.2 and 1.3 above.

In addition, the client will provide evidence to the certification body that the Target Reference Points are and will continue to be more precautionary than the Limit Reference Points.

2. The AFMA reference points currently used for the icefish fishery are those reference points specified and used by CCAMLR, as shown in all CCAMLR documentation including WGFS reports, Scientific Committee recommendations, and Commission Conservation Measures adopted.

The client will also provide details on how any changes to these reference points will be incorporated by CCAMLR and AFMA in future.

Deadline: Same as for Condition 1.2

Progress on Condition 1.4: Again, the stipulation for this Condition is to review the TRP for mackerel icefish and then discuss how the AFMA reference point relates to the CCAMLR proposed TRP

The Commonwealth Fisheries Harvest Strategy Policy (DAFF 2007) indicates that it is Australian Government Policy to support catch level decisions taken by international management bodies such as CCAMLR. The TRP reported by AFMA (AFMA 2009) is the same as that used by CCAMLR and AFMA has always set the TAC for mackerel icefish in accord with CCAMLR decisions. This answers in part the second part of the Condition. However, it does not answer how well these account for the stock biology, including food web dynamics.

SCS notes, however, that one of the two Biological Reference Points still specified by AFMA (AFMA 2009), and considered by the assessment team to be a LRP, is inappropriate for mackerel icefish:

“..the probability that spawning biomass will fall below 20% of the pre exploitation level over the two year projection period must not exceed 0.1.”

As noted in the original mackerel icefish assessment report (SCS 2006) de la Mare et al. (1998) had shown that the probability of the spawning stock falling below 20% of the median unexploited stock level was about 0.5, even in the absence of a fishery due to the highly variable recruitment. De la Mare et al. (1998) had also suggested that an appropriate objective would be to ensure that the probability that, over a specified period, the spawning stock might fall below the 20% level was not increased by fishing by more than 0.05. This alternative LRP was examined when evaluating precautionary constant catch limits over a 20 year projection period, but proposed the currently applied 75% escapement objective as the basis for evaluating short term projections following

abundance surveys. This issue will be revisited as part of the full re-assessment of the fishery.

The studies in progress by AAD, AFMA, and CCAMLR (as previously described) are designed to fully review the stock dynamics of mackerel icefish as well as review the harvest control rules – and all of this to include food web dynamics.

When completed, it is anticipated by the client that these reports will answer the Condition directly. As indicated under the progress for Condition 1.2, however, the timelines for completing the proposed work have had to be extended but verbal reports from AAD indicated that the project is regarded as being on track under a revised timeline, but will not be completed by the end of 2010.

SCS’s determination is that there has not yet been sufficient progress on this condition to allow it to be closed and that the requirements specified in Condition 1.4 would be re-examined during the full re-assessment of the fishery using the revised PISGs specified in the latest FAM v2 (2009).

Status of Condition 1.4: Open – as Condition 1.2

1.1.4.2		
Stock assessment methods are statistically rigorous, major uncertainties have been considered and assumptions have been evaluated.		
SG 60	SG 80	SG 100
Sensitivity analyses have been conducted.	The assessment uses parameter estimation procedures that take account of observation and process uncertainty and are recognized to comply with accepted standards of statistical analysis. The assessment takes into account major uncertainties in the data and functional relationships. The robustness of the management advice to sensitivities in the assessment has been investigated.	The assessment method has been simulation tested and the results show that major outputs of management interest meet required levels of precision and accuracy. The assessment addresses all statistically significant uncertainties in the data and functional relationships and evaluates the assumptions in terms of scope, direction and bias relative to management-related quantities. There is a comprehensive evaluation of sensitivities to assumptions, parameters and data for key outputs of interest such as stock abundance.

Score: 79

Condition 1.5: The approach that is used in determining the recommended TAC should be investigated relative to uncertainty in the estimate of natural mortality, the imprecision in the estimates of the parameters of the mixture of components of the length composition data and the uncertainty in the parameters of the growth curve, and alternative stock structures. There should be an explicit report demonstrating the precautionary nature of the approach and how additional information on these parameters is being incorporated.

Client Action Plan: The client will provide the certification body with the same information as in Condition 1.2 and 1.3. In addition, the client will ensure that the information includes a review of the methods for setting the TAC. The finalisation of the report on Management Strategy Evaluation will explicitly deal with the precautionary nature of the approach and how additional information on the parameters is being incorporated.

Deadline: December 2010

Progress on Condition 1.5: The Condition for this indicator requires a review of the TAC setting process to see how sensitive it is to the known uncertainties in stock dynamics.

As indicated earlier, the studies underway by AAD, AFMA, and CCAMLR will fully review stock dynamics, food web interactions, and the harvest control rules that utilizes this information. As indicated under the progress for Condition 1.2, however, the timelines for completing the proposed work have had to be extended but verbal reports from AAD indicated that the project is regarded as being on track under a revised timeline, but will not be completed by the end of 2010.

A review of the TAC setting process cannot be completed until these studies are finished, so there is nothing to review at this time.

SCS's determination is that there has not yet been sufficient progress on this condition to allow it to be closed and that the requirements specified in Condition 1.5 would be re-examined during the full re-assessment of the fishery using the revised PISGs specified in the latest FAM v2 (2009).

Status of Condition 1.5: Open – as condition 1.2

1.1.5.1		
Current stock sizes are above associated limit reference points.		
SG 60	SG 80	SG 100
Stock assessments show that there is a reasonable chance that the stock is at or above the LRP.	Stock assessments show that there is a greater than 80% probability that the stock is above the LRP.	Stock assessments show the stock to be above the LRP with greater than 90% probability.

Score: 75

Condition 1.6: Meet Condition 1.3. In meeting Condition 1.3, ensure that there is an assessment that shows the probability that the current spawning biomass lies above the chosen limit reference point for the icefish stocks at HIMI. This report should be reviewed by AFMA, AAD, and CCAMLR.

Client Action Plan: The client will provide the same information as submitted under Conditions 1.2, 1.3, 1.4 and 1.5. Again, it is anticipated that the MSE report in 2008/09 will specifically address the relationship between survey indicators of Spawning Stock Biomass, and the actual (modelled) level of SSB, and how well the management strategies perform against the survey results and indicators.

Deadline: December 2010

Progress on Condition 1.6: The Condition for this indicator requires a review of the stock status.

As indicated earlier, the studies underway by AAD, AFMA, and CCAMLR will fully review stock dynamics, food web interactions, and the harvest control rules that utilize this information. As indicated under the progress for Condition 1.2, however, the timelines for completing the proposed work have had to be extended but verbal reports from AAD indicated that the project is regarded as being on track under a revised timeline, but will not be completed by the end of 2010.

SCS’s determination is that there has not yet been sufficient progress on this condition to allow it to be closed and that the requirements specified in Condition 1.6 would be re-examined during the full re-assessment of the fishery using the revised PISGs specified in the latest FAM v2 (2009).

Status of Condition 1.6: Open – as condition 1.2

1.1.5.2		
Current exploitation rates are below associated limit reference points.		
SG 60	SG 80	SG 100
Stock assessments show that there is a reasonable chance that the current exploitation rate is at or below the LRP.	Stock assessments show that there is a greater than 80% probability that the current exploitation rate is below the LRP.	Stock assessments show the current exploitation rate to be below the LRP with greater than 90% probability.

Score: 79

Condition 1.7: Meet Condition 1.3. In addition, show with what probability subsequent survey estimates of the biomass of the residual spawning stock exceeded the levels predicted over recent years.

Client Action Plan: Meet condition 1.3, as outlined above. Include the feedback mechanisms described in review of the management measures being evaluated under the MSE outlined above. Determine if the assessment needs to encompass a time series of surveys as part of the MSE work.

Deadline: December 2010

Progress on Condition 1.7: The Condition for this indicator requires a review of the stock status as in 1.1.5.1.

The studies underway by AAD, AFMA, and CCAMLR are addressing this issue by reviewing the status of the stock and the applicability of the harvest control rules.

In addition, a study of age specific mortality rates is being conducted and will be delivered to the assessment team once completed.

As indicated under the progress for Condition 1.2, however, the timelines for completing the proposed work have had to be extended but verbal reports from AAD indicated that the project is regarded as being on track under a revised timeline. However the project will not be completed by the end of 2010.

SCS's determination is that there has not yet been sufficient progress on this condition to allow it to be closed and that the requirements specified in Condition 1.7 would be re-examined during the full reassessment of the fishery using the revised PISGs specified in the latest FAM v2 (2009)

Status of Condition 1.7: Open – as condition 1.2

1.1.6.1		
Clear, well-tested, precautionary harvest control rules have been established and tested and shown to be effective in meeting management objectives.		
SG 60	SG 80	SG 100
There is an explicit, well-documented control rule that is effective in achieving the objectives with respect to limit reference points. The control rule is being applied. Decisions about catch limits generally follow the agreed strategy.	The harvest control rule has been simulation tested and shown to be effective with respect to the uncertainty concerning the biology of the stock and the uncertainties associated with stock assessment. Decisions about catch limits follow the agreed strategy.	The harvest control rule has been thoroughly simulation tested and shown to be effective when taking into account ecological interactions, predator-prey relationships, and regime shifts. The agreed harvest strategy is applied without exception.

Score: 79

Condition 1.8: Carry out appropriate simulation testing to consider the harvest strategy in relation to the characteristics of the icefish stock to evaluate the robustness of the reference points and the fishery management model.

Client Action Plan: The client will provide the same information as required under Conditions 1.2 and 1.3 as it will answer the question about the appropriate management strategy, under the MSE approach being taken for condition 1.2 above.

Deadline: December 2010

Progress on Condition 1.8: The Condition for this indicator requires simulation testing of the harvest strategy to evaluate the robustness of the reference points.

The studies underway by AAD, AFMA, and CCAMLR are addressing this issue by reviewing the status of the stock and the applicability of the harvest control rules. The outcomes of these studies will be made available to SCS as completed.

As indicated under the progress for Condition 1.2, however, the timelines for completing the proposed work have had to be extended but verbal reports from AAD indicated that the project is regarded as being on track under a revised timeline, but will not be completed by the end of 2010.

SCS’s determination is that there has not yet been sufficient progress on this condition to allow it to be closed and that the requirements specified in Condition 1.8 would be re-examined during the full re-assessment of the fishery using the revised PISGs specified in the latest FAM v2 (2009).

Status of Condition 1.8: Open – as condition 1.2

1.2.1		
There is a well-defined and effective strategy, and a specific recovery plan in place, to promote recovery of the target stock within a reasonable time frame.		
SG 60	SG 80	SG 100
A recovery plan exists that clearly identifies the conditions under which it will be invoked, identifies a time frame for recovery that is appropriate to the biology of the species, and specifies appropriate controls on the level of exploitation that, at face value, are likely to achieve recovery within the specified time period.	There is a well-defined precautionary trigger that initiates the recovery strategy. If the recovery strategy allows the fishery to continue operating, but with a reduced level of allowable catch, the fishery-dependent data will be used to monitor the response of the stock. There are comprehensive and pre-agreed management responses to ensure recovery of the depleted stock within a specified and appropriate time frame. Through simulation testing, it has been demonstrated that the recovery plan has a high probability of achieving successful recovery.	The strategy requires that regular fishery independent monitoring of stock is implemented to monitor progress of the recovery plan. The strategy requires that the management response is modified if monitoring demonstrates significant departure of the stock from the expected recovery trajectory.

Revised Score: 80

Condition 1.9: The client only needs to develop and abide by a condition for this indicator if it plans to begin fishing in areas previously described as depleted (i.e. Pike, Discovery, and Shell Banks). Before commercial harvesting is permitted to recommence on these populations/stocks, the fishery management system would have to:

1. Provide an explicit specification of the conditions that require that the recovery strategy is invoked.
2. Specify precisely how the harvest is to be controlled as the stock recovers, the time period expected for recovery, and the conditions that signal that the stock has recovered.
3. Provide a simulation study that demonstrates that there is a high probability that the stock will recover if the recovery strategy is invoked.

Client Action Plan: The client will submit to the certification body information that shows how assessments will be done before areas now closed to fishing are opened for future fishing. The specific information to be submitted includes:

Completion of food web model to determine likelihood of food depletion in recovery phase given natural variation in stock abundances

Where stock depletion is evident, maintain commercial harvest levels at zero, and maintain annual surveys of population(s) for assessment purposes

MSE work to be completed to derive appropriate indicators for recovery and options for harvesting regimes, where applicable.

Deadline: Annual reports to SARAG (September each year)

- CCAMLR paper November 2008
- SARAG final report by September 2009

Progress on Condition 1.9: The Condition for this indicator is only applicable if fishing is to begin in areas now closed to fishing. There are currently no plans to fish in currently closed areas. However, in compliance with the MSC requirements, the client had agreed to provide the background necessary to meet the Condition.

The assessment team has been provided with a detailed verbal description of the steps that would need to be followed before there could be any re-commencement of fishing in the currently closed areas, including on the Pike, Discovery and Shell Banks whose stocks of mackerel iceshake have previously been described as depleted. This process would involve surveys to determine the current stock size, a formal assessment, and the agreement of all domestic and international agencies involved in the assessment and management of CCAMLR fisheries. This process would therefore include all the requirements specified in Condition 1.9.

There are still no new fishing areas under consideration and there is an agreed and comprehensive process that would need to be followed before there could be any re-commencement of fishing on stocks of mackerel iceshake that have previously been described as depleted. SCS is therefore satisfied that this Condition has been met and considers it to be closed. SCS rescored this indicator at 80

Status of Condition 1.9: Closed

1.3.2		
Data and stock assessment indicate no changes in structure that would alter reproductive capacity.		
SG 60	SG 80	SG 100
Trends in age, sex, genetic structure, recruitment, and spawning stock are examined and found to be consistent with those trends that would be the expected response of the population to the levels of exploitation experienced by the stock.	The extent to which trends in age, sex, genetic structure, recruitment and spawning stock might deviate from the expected trends, allowing for both natural variability and uncertainty, has been specified. The values of the variables remain within these specified, acceptable ranges.	Data and assessments indicate that recruitment and spawning stocks are at robust levels for all genetically identified stocks of the target species.

Score: 79

Condition 1.10: Estimate the expected changes in size and age at maturity, age composition, and fecundity and establish a routine comparison of observed data with these expected values to ensure that unexpected changes might be detected.

Client Action Plan: Identify suitable indicators and estimate changes in parameters identified, as part of the MSE program identified in Condition 1.2

Deadline: Same as for Condition 1.2

Progress on Condition 1.10: Studies on food web dynamics are underway by AFMA, AAD and CCAMLR. These studies will be made available as soon as possible. As indicated under the progress for Condition 1.2, however, the timelines for completing the proposed work have had to be extended but verbal reports from AAD indicated that the project is regarded as being on track under a revised timeline, but will not be completed by the end of 2010. It was previously reported that the client had already engaged in discussions with AAD and AFMA regarding the need for better data on age composition, age at maturity, and fecundity.

SCS’s determination is that there has not yet been sufficient progress on this condition to allow it to be closed and that the requirements specified in Condition 1.10 would be re-examined during the full re-assessment of the fishery using the revised PISGs specified in the latest FAM v2 (2009).

Status of Condition 1.10: Open – as condition 1.2

Principle 2 - Status of Previously Raised Conditions

2.1.3.1		
The ecological risks and potential ecological impacts of the fishery.		
SG 60	SG 80	SG 100
The potential effects of the fishery have been determined by internal fishery analysis The potential impacts of the fishery are	The potential effects of the fishery have been determined by detailed, scientifically defensible and peer reviewed analysis of risks using existing data, and based on comparative studies between fished and non-fished but otherwise comparable ecosystems, considering space and time scales that are relevant to the scale of the fishery	The potential effects of the fishery have been determined by detailed, comprehensive, scientific and peer reviewed analysis of risks based on comparative studies between fished and non-fished but otherwise comparable ecosystems, across large space and time scales, and using precautionary threshold levels of effect of the fishery for a broad range of ecological attributes/indicators. The potential impacts of the fishery are established

<p>established in consultation with a limited range of stakeholders and experts, and based on literature data from other fisheries or regions</p>	<p>The potential impacts of the fishery are established in consultation with stakeholders and a range of relevant experts Causes and effects in the fishery are broadly known and include the range of habitats in the fishery and use ecologically relevant attributes and statistically robust designs. A program of research targeting the main ecological risks posed by the fishery is underway</p>	<p>in consultation with stakeholders and a range of relevant experts Causes and effects in the fishery are well known, comprehensive across habitats and regions and use ecologically relevant attributes and statistically robust designs. There are ongoing research programs designed to assess impacts, and include space and time across a range of scales up to the scale of the fishery. The impact-detection designs include and control for the effects of factors outside the fishery in determining fishery impacts.</p>
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Revised Score: 80

Condition 2.1: The fishery must complete a comprehensive scientifically robust assessment of the ecological risks of the fishery (such as the one started by CSIRO), including potential impacts on benthic systems, key land-based marine predators, and sharks, skates and rays, that is already underway. The report should be sure to include the range of stakeholder views/inputs and meet peer review standards for scientific assessments.

Client Action Plan for Condition 2.1:

1. Upon completion of Ecological Risk Assessment (ERA) project by CSIRO for AFMA, identifying potential impacts of the fishery on the ecosystem and ecologically related species, the client will submit this to the certification body within 30 days of its completion, along with any peer reviews or commentaries on this report.
2. Seek funding for benthic habitat impact study from FRDC and other research providers.
3. Conclude report on benthic habitat impacts of the icefish fishery.

Deadline: Completion dates are:

1. ERA report due for completion and presentation to SARAG meetings in 2007.
2. Initial funding approval July 2006
3. Milestone reports on benthic study annually at SARAG; final report Sept 2010.

Again, if the planned studies are not going to be completed on time, the client will advise the certification body as to any additional time required. The client notes it does not have control over the estimated timelines for completion of the identified work, and can only be responsible for providing the work upon its completion.

Progress on Condition 2.1: To meet the 80 scoring guideposts, the fishery was required to complete the ERA identified during the assessment process.

An ERA draft report was provided in November 2006. The final report on the ERA, along with associated management plans was provided to the committee for the 2010 surveillance. While the benthic impacts studies have not been completed, they are not specified in the condition.

Status of Condition 2.1: Closed.

Condition 2.2 (Also for Indicator 2.1.3.1): Should any risks identified under the risk assessment be rated as moderate or high, the fishery would have to provide data and/or information showing what measures are being taken to mitigate the risks and analyses of why the measures are sufficient.

Client Action Plan:

1. Participate fully with AFMA and other government agencies to achieve appropriate management responses to identified risks, and mitigation measures required (or to be developed).
2. Submit to the certification body evidence showing what measures are being taken by the managing authorities.

Deadline: Timelines for submission of information are:

- Strategic review of HIMI fishery due for completion in 2010
- Annual reports of SARAG and SouthMAC
- ERA report final Sept 2007

Progress on Condition 2.2: AFMA has developed Risk Management Plans for both the demersal and the midwater sectors in the fishery. Quantitative risk assessments for the fishery also indicate that none of the non-target species are being caught at levels that are likely to represent a significant threat to those species.

Status of Condition 2.2: Closed.

2.1.3.3		
The potential for ecosystems, habitats and species that may be affected by the fishery to recover from any fishery impacts, or to have impacts mitigated.		
SG 60	SG 80	SG 100
resilience to fishery impacts and recovery potential have been estimated for the main bycatch species and habitats research projects are underway to improve estimates of impacts and the recovery potential for bycatch species, dependent species or habitats	adequate estimates of resilience to fishery impacts and recovery potential have been determined for the main bycatch species and habitats research projects, including modelling and field measurements, are underway to improve estimates of impacts and the recovery potential for dependent species that may be potentially affected by the fishery, either through removal of target species, bycatch or habitat impacts models and estimates of resilience and recovery potential take account of important aspects of ecosystem dynamics, environmental uncertainty and other factors external to the fishery	robust estimates of resilience to fishery impacts and recovery potential have been determined for all the documented bycatch and major potentially affected dependent species by removal of the target species, bycatch or habitat impacts research projects, including modelling and field measurements, are underway to improve estimates of impacts and the recovery potential for the most important impacts models and estimates of resilience and recovery potential take full account of ecosystem dynamics, environmental uncertainty and other factors external to the fishery

	areas closed to fishing are used to provide support for addressing the fishery impacts.	closed areas (permanent no-take reserves) are used to provide adequate offset for otherwise unavoidable impacts of the fisher.
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Revised Score: 80

Condition 2.3: Conditions 2.1 and 2.2 apply.

Client Action Plan: Same as for Conditions 2.1 and 2.2 above.

Progress on Condition 2.3: Same as for Conditions 2.1 and 2.2 above.

ERA and ERMs have been developed to cover species impacted by the fishery. Studies of benthic impacts and ecosystem dynamics are underway. ERA methods are based on identifying levels of impact that could impair recovery, and as such meet the intent of this condition.

Status of Condition 2.3: Closed.

2.1.5.1		
The impact of the removal of the target species or other direct fishery activities on ecosystems, habitats, associated or dependent species, or on biological productivity of the region.		
SG 60	SG 80	SG 100
<ul style="list-style-type: none"> • some direct impacts of the fishery through removal of the target species have been identified • existing evidence does not suggest that impacts are exceeding limits • there is a fishery-independent monitoring program of some impacts • an ongoing program of research is designed to model and evaluate a range of the potential impacts and to explore mitigation measures 	<ul style="list-style-type: none"> • the important direct impacts of the fishery resulting from removal of the target species have been identified • the main impacts on ecosystems, habitats, productivity and ecologically associated or dependent species are generally within the agreed limits, and other existing evidence does not suggest other impacts are exceeding limits • there is a fishery-independent monitoring program that provides robust data on the levels of the main impacts, with frequent reporting to fishery managers • an ongoing program of research is designed to model and evaluate a range of the potential impacts and to further develop mitigation measures • key impacts of the fishery that 	<ul style="list-style-type: none"> • all the likely impacts of the fishery resulting from removal of the target species are identified and quantified • the ecological impacts on ecosystems, habitats, productivity and ecologically associated or dependent species are always maintained within the agreed limits • there is a fishery-independent monitoring program that provides robust data on the levels of all the important impacts, with high intensity reporting to fishery managers • an ongoing program of research is designed to model and evaluate all impacts, to develop predictive cause-effect models, and to improve mitigation measures • key impacts of the fishery that may be unavoidable through gear or

	may be unavoidable through gear or deployment modifications are mitigated on a precautionary basis through the use of closed areas (no-take reserves) on a regional basis.	deployment modifications are mitigated on a precautionary basis through the use of closed areas (no-take reserves) on a regional basis.
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Revised Score: 80

Condition 2.4: Conditions 2.1 and 2.2 apply.

Client Action Plan: Same as for Conditions 2.1 and 2.2 above.

Progress on Condition 2.4: Same as for Conditions 2.1 and 2.2 above. All issues of the scoring guidepost 80 related to this performance indicator have been met, based on either management arrangements (establishment of MPAs in the region, ongoing comprehensive observer program), via ongoing research programs (benthic impacts and ecosystem structure and response), or via the recent ERA and ERM process.

Status of Condition 2.4: Closed.

2.2.1.2		
The functional roles and importance of the target species in the trophic network of any threatened, protected, or 'icon' species in the region.		
SG 60	SG 80	SG 100
<ul style="list-style-type: none"> • The key prey, predators and competing species are broadly understood • There is a basic knowledge of feeding relationships of some of the main threatened, protected, or 'icon' species • Research is being designed to study foodwebs in the region and trophic requirements of some of the threatened, protected, or 'icon' species 	<ul style="list-style-type: none"> • The basic structure of the regional foodwebs have been determined • There is a good basic knowledge of the trophic relationships and requirements of the main threatened, protected, or 'icon' species • The trophic role of the target species at each of its main life stages is broadly understood in relation to the trophic requirements of the main threatened, protected, or 'icon' species. • There is an ongoing research program designed to evaluate the natural dynamics and productivity in regional foodwebs, and to model and assess the impacts of the fishery on the trophic requirements of the main threatened, protected, or 'icon' species. 	<ul style="list-style-type: none"> • The structure of the regional foodwebs is well understood • There is a good quantitative knowledge of the trophic relationships and requirements of the threatened, protected, or 'icon' species • The trophic role of the target species is well known at each of its main life stages in relation to the trophic requirements of the threatened, protected, or 'icon' species. • There is a range of ongoing research programs designed to evaluate the natural dynamics and productivity in regional foodwebs, and to model and assess the impacts of the fishery on the trophic requirements of the threatened, protected, or 'icon' species.

Score: 75

Condition 2.5: The client should provide evidence that AAD research on the trophic role of icefish in predator diets either has been or is being conducted. The AAD research should be properly peer reviewed and published. Once available, this information should be used in Condition 2.1.

Client Action Plan: Trophic interaction research started in 2004 to be completed, with full review by peer-reviewed journals, SARAG and CCAMLR.

Use information for Condition 2.1 above.

Deadline: Timelines for submission of information are:

- Annual reports to SARAG on progress
- CCAMLR paper October 2008
- SARAG final report Sept 2009

Progress on Condition 2.5: SCS was provided with the draft ERA report and the preliminary residual risk assessments. This meets part of the condition.

Studies underway by CCAMLR and AFMA/AAD are looking at the food web interactions in the fishery. A series of papers were presented at the 1st International Science Symposium on the Kerguelen Plateau in Concarneau, France, 14-16 April 2010. However, formal publications are not expected to be available before the end of the year.

SCS determined that while there has been progress on this condition, it cannot be closed at this time as the underlying studies have not been completed. The remaining aspects of this condition will be re-examined during the full reassessment of the fishery using the revised PISGs specified in the latest FAMv2 (2009). The assessment team will expect a timeline and completion date for the food web study work in the client action plan of the new condition.

Status of Condition 2.5: Open – on target however the food web studies are behind target and will not be completed before the end of this certification (31 March 2011)

2.2.3.1		
The ecological risks and the range of potential ecological impacts of the fishery on any threatened, protected, or 'icon' species.		
SG 60	SG 80	SG 100
<ul style="list-style-type: none"> • The potential effects of the fishery have been determined by internal fishery analysis • The potential impacts of the 	<ul style="list-style-type: none"> • The potential effects of the fishery have been determined by detailed, scientifically defensible and peer reviewed analysis of risks based on existing data, using precautionary threshold levels of effect of the fishery on populations of all threatened, protected, or 'icon' 	<ul style="list-style-type: none"> • The potential effects of the fishery have been determined by detailed, comprehensive, scientific and peer-reviewed analysis of risks, across large space and time scales, and using precautionary threshold levels of effect of the fishery on populations of all the threatened, protected, or 'icon' species.

<p>fishery are established in consultation with a limited range of stakeholders and experts, and based on literature data from other fisheries or regions</p> <ul style="list-style-type: none"> • Resilience to fishery impacts and recovery potential have been estimated for the main threatened, protected, or 'icon' species 	<p>species.</p> <ul style="list-style-type: none"> • Adequate estimates of resilience to fishery impacts and recovery potential have been determined for the main threatened, protected, or 'icon' species • The potential impacts of the fishery are established in consultation with stakeholders and a range of relevant experts • Research projects, including modelling and field measurements, are underway to improve estimates of impacts and recovery potential • Models and estimates of resilience and recovery potential take account of important aspects of environmental uncertainty and other relevant factors external to the fishery • Studies of risks in the fishery are comprehensive across habitats and regions and use statistically robust designs. • Areas closed to fishing are used to provide support for addressing potential fishery impacts on threatened, protected, or 'icon' species. 	<ul style="list-style-type: none"> • Robust estimates of resilience to fishery impacts and recovery potential have been determined for the all the threatened, protected, or 'icon' species • The potential impacts of the fishery are established in consultation with stakeholders and a range of relevant experts • Research projects, including modelling and field measurements, are underway to improve estimates of impacts and the recovery potential for the most important impacts on all the threatened, protected, or 'icon' species • Models and estimates of resilience and recovery potential take full account of ecosystem dynamics, environmental uncertainty and other factors external to the fishery • Studies of causes and effects in the fishery are comprehensive across habitats and regions across a range of scales up to the scale of the fishery, and use a range of species-specific attributes and statistically robust designs • Closed areas (permanent no-take reserves) are used to provide adequate offset for otherwise unavoidable potential impacts of the fishery on threatened, protected, or 'icon' species.
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Revised Score: 80

Condition 2.6: Same as Condition 2.1

Client Action Plan: Same as for Condition 2.1

Progress on Condition 2.6: Same as for Condition 2.1 above. The ERA and ERM have an explicit focus on threatened, protected, and icon species. The impacts to these species have been analyzed based on fisheries observer and independent survey data, using qualitative and quantitative models. While no intensive models were presented for seabird species, which have been impacted on some level by the fishery, bycatch rates appear to be low and the finding of no significant risk in the ERA provides support for the fishery meeting this condition at the 80 level.

Status of Condition 2.6: Closed

Principle 3 - Status of Previously Raised Conditions

3.2.1.4		
The provision within the management system for rebuilding and recovery of depleted stocks.		
SG 60	SG 80	SG 100
The management system has targets for rebuilding and recovery of overfished stocks.	The management system has effective provisions for achieving targets for rebuilding and recovery of overfished stocks within a specified time frame.	The management system sets and has demonstrated a trend toward achieving rebuilding and recovery goals of all over-fished stocks. The management system does not allow fishing on any stock impacted by the fishery that has declined below limit reference points until the fishery can be demonstrated to be significantly above the limits imposed.

Score: 70

Condition 3.1: The management system must be improved to contain criteria for assessing when a stock within the fishery is overfished, the strategies to be adopted when the stock is classified as overfished, and the conditions under which an overfished (stock or) fishery is considered to have recovered. This is considered in more detail under Principle 1. To the extent possible, this condition should be informed by or be coincident with conditions in Principle 1.

Client Action Plan: Same as for Condition 1.2 with the MSE and other projects.

Progress on Condition 3.1:

This condition is to be addressed through the completion of the ecosystem model being developed by AAD (see Condition 1.2). Conduct of the Management Strategy Evaluation (MSE) is contingent upon completion of the model. The MSE will include an evaluation of when the stock is considered depleted and what type of recovery plan may be required for rebuilding. SCS was advised that the model remains under development and that it may be up to two years before the results of the MSE work are available.

SCS's determination is that there has not yet been sufficient progress on this condition to allow it to be closed and that the remaining aspects will be re-examined during the full re-assessment of the fishery against the requirements of the Default Assessment Tree of FAM v2 (2009), which began in May 2010.

Status of Condition 3.1: Open – on target, however the MSE is behind target due to the ecosystem modeling not being finalized (see condition 1.2)

3.2.1.7

The program to prevent, mitigate, or minimize adverse impacts on habitat caused by fishing.

SG 60	SG 80	SG 100
Efforts are made to identify, document, and assess the risks to habitat from fishery impacts.	Specific actions have been taken to restrict fishing gear and fishing practices to prevent, mitigate, or minimize actual or potential impacts on habitat caused by fishing.	<ul style="list-style-type: none">• There is continuing, comprehensive effort to identify, document, and assess the risks to habitat from fishery impacts.• There is a demonstrated pattern of actions to restrict fishing gear and practices to prevent, mitigate, or minimize adverse impacts on habitat and has achieved a demonstrated trend of reductions in adverse habitat impacts from fishing, or has determined that no impacts on habitat result from fishing.

Revised Score: 90

Condition 3.2: Meet Conditions 2.1 and 2.2. In addition, provide evidence to the certifier that there is some process in place to provide an ongoing, although periodic, process to identify, document, assess, reduce and ameliorate risks to habitat resulting from fishing practices. This process should meet requirements set out in the Management Plan.

Client Action Plan:

- Finalise benthic habitat impacts study
- Maintain consistent, appropriate, observer coverage on all operations
- Report annually to SARAG on bycatch species, quantities and profiles for evaluation and risk reduction strategies to be developed
- Maintain shot-by-shot recording of fishing operations including benthic bycatch
- Evaluate alternative fishing methods to reduce risks of habitat damage

The client notes that the process of the Ecological Risk Assessment is an ongoing one. The AFMA requirements for ERA reporting have increased dramatically with a series of recent Ministerial Directions to AFMA that outline major changes in the way Australian fisheries are to be managed. Aside from this, there are also direct requirements under the Environment Protection and Biodiversity Convention Act, which require formal review every 5 years, for any Commonwealth fishery, as well as any fishery in Australia that wishes to export product

Deadline: Timelines for completion are:

- FRDC report final due Sept 2010.
- Annual reports to SARAG
- Mon

Progress on Condition 3.2:

The client has:

- maintained the consistent, appropriate, observer coverage on all operations;

- reported annually to SARAG on bycatch species, quantities and profiles for evaluation and risk reduction strategies to be developed;
- maintained shot-by-shot recording of fishing operations including benthic bycatch;
- continued evaluation of alternative fishing methods to reduce risks of habitat damage; and
- introduced a prohibition on midwater trawling for icefish during peak seabird foraging months, and on daytime midwater trawling at other times

Further, SCS notes that, in addition to the significant areas of the fishery being included in marine protected areas, further restrictions are under consideration through the development of Conservation Zones and that this will potentially provide added protection to habitat types affected by the HIMI Mackerel Icefish Fishery.

The final Ecological Risk Assessments for the demersal and midwater trawl gears used in the HIMI fishery were provided together with the results of a rapid quantitative risk assessment of eight species of chondrichthyans and 59 species of teleosts in the HIMI fishery.

The FRDC-funded study, *Demersal fishing interactions with marine benthos in the Australian EEZ of the Southern Ocean: an assessment of the vulnerability of benthic habitats to impact by demersal gear*, is continuing. A progress report and associated appendices including technical reports on the benthic camera system, a paper on estimation of the swept area of demersal longline based on *in-situ* video footage, a preliminary scientific assessment of the benthic fauna in the HIMI region and a field identification guide for benthic invertebrates in the HIMI region were provided. The project has been unavoidably delayed for 12 months due to the redirection of the research vessel *Aurora Australis* to respond to a medical emergency during the latest scheduled research voyage. The project is now scheduled to be completed by October 2011.

As indicated above, SCS has found that the Client has met Conditions 2.1 and 2.2 as required by this Condition. In addition, SCS finds that the ongoing monitoring and management actions taken by the client, together with the progress made on the benthic impact study are sufficient to meet the Condition in its entirety. SCS has rescored this indicator at 90.

Status of Condition 3.2: Closed

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