



## **MSC Final Report**

### **Macquarie Island Toothfish Fishery**

April 2012

The Fishery Evaluated in this Report:

Species: *Dissostichus eleginoides*  
Geographic Area: Australian territorial waters and EEZ around Macquarie Island  
Fishing Method: Demersal Trawl and Longline  
Fishery Management: The Australian Fishery Management Authority

Accredited Certification Body:

Scientific Certification Systems  
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**Versions Issued**

Version No.	Date	Description Of Amendment
<b>1</b>	December 2011	Client Draft Report
<b>2</b>	January 2012	Peer Review Report
<b>3</b>	March 2012	Public Comment Draft Report
<b>4</b>	April 2012	Final Report
<b>5</b>		

**MSC scheme documents:**

MSC Accreditation Manual Issue 4

MSC Fisheries Assessment Methodology (FAM) Version 2.1

MSC Fisheries Certification Methodology (FCM) Version 6.1

MSC TAB Directives

MSC Policy Advisories

MSC Certification Requirements Version 1.2

MSC Guidance to Certification Requirements Version 1.1

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## **PREAMBLE**

This report is the sole responsibility of Scientific Certification Systems (SCS). All advice and comments from Assessment Team members, peer reviewers, client, fishery managers and the Marine Stewardship Council (MSC) have been reviewed and incorporated into the report by SCS as required or deemed appropriate. This fishery was determined to be in scope and in compliance with the MSC first Technical Advisory Board Directive (TAB D-001 v2).

## ABBREVIATIONS AND ACRONYMS

AAD	Australian Antarctic Division
ABARES	Australian Bureau of Agricultural and Resource Economics Organization
AFMA	Australian Fisheries Management Authority
AFZ	Australian Fishing Zone
AHP	Analytical Hierarchy Process
ASI	Accreditation Services International
AT	Aurora Trough
B and B <sub>0</sub>	Biomass and un-fished biomass
CB	Certifying Body
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CEO	Chief Executive Officer
CHSP	Commonwealth Harvest Strategy
CPUE	Catch Per Unit Effort
CSIRO	Commonwealth Scientific and Industrial Research Organization
DAFF	Department of Agriculture, Fisheries and Forestry
DAT	Default Assessment Tree
EEZ	Exclusive Economic Zone
ERA	Ecological Risk Assessment
ETP	Endangered, Threatened and Protected species
ERA	Ecological Risk Assessment
ESD	Ecologically Sustainable Development
FAM	Fisheries Assessment Methodology v2.1
FAO	Food and Agriculture Organization [of the United Nations]
FMA	Fisheries Management Act
HIMI	Heard Island and McDonald Islands
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unregulated and Unreported
MAC	Management Advisory Committee
MITF	Macquarie Island Toothfish Fishery
MPA	Marine Protected Area
MR	Macquarie Ridge
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
NMR	Northern Macquarie Ridge
PI	Performance Indicator
RAG	Resource Assessment Group
SARAG	Sub-Antarctic Resource Assessment Group
SCS	Scientific Certification Systems
SESSF	Southern and Eastern Scalefish and Shark Fishery

SG	Scoring Guidepost
SMS	Southern Macquarie Ridge
SPRFMO	South Pacific Regional Fisheries Management Organization
SSB and R	Spawning Stock Biomass and Recruitment
t	Metric ton
TAB	Technical Advisory Board [of the MSC]
TAC	Total Allowable Catch
UNESCO	United Nations Educational, Scientific and Cultural Organization
WWF	World Wildlife Foundation

## 1. INTRODUCTION

The Marine Stewardship Council (MSC) is a non-profit organization dedicated to the long-term protection or “sustainability” of marine fisheries and related habitats. First started as a joint initiative between Unilever and the World Wildlife Fund (WWF), the MSC is now a fully independent organization that is governed by an independent Board of Directors advised by a panel of scientific, economic, and fishery experts.

The MSC’s original mission statement promoted responsible, environmentally appropriate, socially beneficial, and economically viable fisheries practices, as well as the maintenance of biodiversity, productivity and ecological processes of the marine environment. The current MSC mission statement (redrafted in 2001) provides a slightly more focused mission and reads,

*“Our mission is to use our ecolabel and fishery certification programme to contribute to the health of the world’s oceans by recognizing and rewarding sustainable fishing practices, influencing the choices people make when buying seafood, and working with our partners to transform the seafood market to a sustainable basis.”*

Dedicated to promoting “well-managed” or “sustainable” fisheries, the MSC initiative intends to identify such fisheries through means of independent third-party assessments and certification. Once certified, fisheries will be awarded the opportunity to utilize an MSC promoted eco-label to gain economic advantages in the marketplace. Through certification and eco-labeling, the MSC intends to promote and encourage better management of world fisheries, many of which have been suggested to suffer from poor management.

The Marine Stewardship Council developed the original standards for sustainable fisheries management in a three-step process: 1) Assemble a group of experts in Bagshot (UK) to draft an initial set of Principles and Criteria; 2) Conduct an 18-month process to review the standard in 8 major international venues; and 3) Convene a second set of experts in Warrenton, Virginia (Airlie Conference Center, USA) to revise and finalize the MSC Principles and Criteria.

The MSC Fisheries Certification Methodology used for this report, the Marine Stewardship Council Fisheries Assessment Methodology (FAM) and Guidance to Certification Bodies Including Default Assessment Tree and Risk-Based Framework Version 2.1 was issued on 1 May 2010.

## 2. SUMMARY

### 2.1 The Assessment Process

A pre-assessment was conducted on the Macquarie Island toothfish fisheries as recommended by the MSC program. After review of the pre-assessment, the applicants for certification authorized the formal, full assessment of the fishery. All aspects of the assessment process were carried out under the auspices of Scientific Certification Systems, Inc., an accredited MSC certification body, and in direct accordance with MSC requirements.

In order to ensure a thorough and robust assessment process, and a process in which all interested stakeholders could and would participate, SCS sought comment from the public through direct mailing and posting advisories on the MSC website and was available for comments throughout the assessment process. SCS responded to requests for information and participation within two days of any inquiry.

To be thorough and transparent, SCS provided opportunities for input at all stages of the assessment process. The general steps followed were:



- **Announcement of the intention for the fishery to undergo a full assessment (10<sup>th</sup> May 2011)**  
At this first step of the assessment process, SCS provided the MSC thorough background information on the fishery and informed the public that the fishery intended to undergo a full MSC assessment. Identified stakeholders were informed of that intention directly through email, phone calls or both.
- **Team selection (March-May 2011)**  
At this second step of the assessment process, SCS sought input from interested parties and invited comment on the suitability of the selected assessment team members. SCS sent out an advisory through direct email and posting on the MSC web site requesting comment on the nominations of persons capable of providing the expertise needed in the assessment. After a comment period of 10 working days, SCS was able to confirm the assessment team.
- **Determining Performance Indicators and Scoring Guideposts (May 2011)**  
In accordance with the assessment procedures required by the MSC, review of the Default Assessment Tree (DAT) was conducted by the assessment team for applicability to the fishery. It was determined that the DAT was sufficient and no modifications were necessary. The suitability of using the DAT for this fishery was up for public comment for a period of 30 days. No comments were received and the DAT was confirmed to use for this fishery on the 24<sup>th</sup> June 2011.
- **Input on fishery performance (May-June 2011)**  
Once the DAT was confirmed, SCS requested that the clients compile and submit written information to the assessment team illustrating the fishery's compliance with the required performance indicators. At the same time, SCS requested that stakeholders submit their views on the fishery functions and performance against the MSC principles.
- **Meetings with industry, managers, and stakeholders (20th-23rd June, 2011)**  
SCS planned for and conducted meeting in Hobart, Tasmania, Australia between the 20<sup>th</sup>-23<sup>rd</sup> of June 2011.
- **Scoring the fishery (June 2011)**  
The assessment team scored the fishery using the required MSC methodology including the DAT found in the Fisheries Assessment Methodology (FAM). Scores were determined by the assessment team and team leader by consensus in a closed meeting.
- **Drafting the report (June-November 2011)**  
The assessment team in collaboration with the SCS lead assessor, Dr. Sabine Daume, drafted the report in accordance with MSC required process.
- **Selection of peer reviewers (20 December 2011-19 January 2012)**  
SCS released an advisory of potential peer reviewers and solicited comments from stakeholders on the merits of the selected reviewers. Stakeholders were informed of the 10 day comment period by direct email as well as the online posting. No negative comments were received and the two peer reviewers were confirmed to review the report.
- **Release of the Public Comment Draft Report (March 2012)**  
SCS released the draft report for public comment, soliciting stakeholder response through posting on MSC website and direct email to known potential stakeholders.

- Release of Final Report with certification decision (April 2012)  
SCS released the final report with the certification decision for a 15 day objection period. Stakeholders were informed through posting on the MSC website and direct email to known stakeholders.

## **2.2 Meeting Conditions for Continued Certification**

To be awarded an MSC certificate for the fishery, the applicants must agree in a written contract to develop an Action Plan for meeting the 'Conditions' issued by the audit team; The Action Plan must provide specific information on what actions will be taken, who will take the actions, and when the actions will be completed. The Action Plan must be approved by SCS as the certification body of record. The applicant must also agree in a written contract to be financially and technically responsible for surveillance visits by an MSC accredited certification body, which would occur at a minimum of once a year, or more often at the discretion of the certification body (based on the applicant's action plan or by previous findings by the certification body from annual surveillance audits or other sources of information). The contract must be in place prior to certification being awarded. Surveillance audits will be comprised in general of (1) checking on compliance with the agreed action plan for meeting pre-specified 'Conditions', and (2) sets of selected questions that allow the certifier to determine whether the fishery is being maintained at a level of performance similar to or better than the performance recognized during the initial assessment.

### **2.2.1. General Conditions for Continued Certification**

The general 'Conditions' set for the Client, Austral Fisheries Pty Ltd and Australian Longline Pty Ltd, are:

- Client must recognize that MSC standards require regular monitoring inspections at least once a year, focusing on compliance with the 'Conditions' set forth in this report (as outlined below) and continued conformity with the standards of certification.
- Client must agree by contract to be responsible financially and technically for compliance with required surveillance audits by an accredited MSC certification body, and a contract must be signed and verified by SCS prior to certification being awarded.
- Client must recognize that MSC standards require a full re-evaluation for certification (as opposed to yearly monitoring for update purposes) every five years.
- Prior to receiving final certification, the Client shall develop an 'Action Plan for Meeting the Condition for Continued Certification' and have it approved by SCS.

### **2.2.2. Specific Conditions for Continued Certification**

In addition to the general requirements outlined above, the Client must also agree, in a written contract with an accredited MSC certification body, to meet the specific conditions as described in Section 10 of this Report and summarized below (within the timelines that will be agreed in the Action Plan for Meeting the Condition for Continued Certification' to be approved by SCS). Conditions are set for any Performance Indicator that has scored less than 80 (out of 100).

On the basis of the MSC methodology, one Condition was issued by the audit team, in relation to Principle 2, for this fishery.

**2.4.3** Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.

<b>2.4.3 Score</b>	<b>Trawl</b>	<b>Longline</b>
	<b>70</b>	<b>70</b>

**Condition 2.4.3:**

By the first annual surveillance audit, the client shall provide documented evidence that the nature of the impacts of the fishery on different habitat types, at a scale relative to the fishery, is known and that monitoring is continuing to detect any increase in risk to habitat. The client shall include the results of the ongoing study on habitat impacts in the region.

**2.2.3. Recommendations for Additional Improvement**

Where the fishery was found to have met at least the elements for the Scoring Guidepost of 80 (SG80) but issues that were not directly covered in the default assessment tree remained, the assessment team made Recommendations. There was one Recommendation in each of the three Principles:

**Recommendation for 1.2.2:**

Catches in other fisheries that are likely to be from the same stock should be monitored and, if they become a significant proportion of the total catch, they are not only included in the assessment but also taken account when making projections for TAC setting purposes.

**Recommendation for 2.3.2:**

Before trawling resumes in the fishery, a bycatch management strategy should be developed that has limits for interactions with seabirds, seals and other ETP species and appropriate management responses.

**Recommendation for 3.1.1**

- It is recommended that the client actively encourage the responsible Australian agencies to progress bilateral talks with New Zealand so as to ensure that the straddling stock of Toothfish continues to be managed appropriately.
- The client should ensure that a harvest strategy for the MITF is clearly identifiable and that it makes explicit reference to how the fishery meets the requirements of the HSP.

**2.3 Certification Determination**

It is the consensus judgment of the assessment team and of the SCS Certification Determination Committee that the Australian Macquarie Island toothfish fishery complies with the MSC Principles and Criteria. Therefore, SCS as the certification body of record concludes that the fishery should be issued an MSC Fishery certificate. The lead assessor for the assessment team presented all evidence to the SCS Certification Panel, which agreed with the assessment team's decision and authorized certification of the

fishery. The client has submitted for approval, and SCS has approved, an Action Plan (See Section 12) for meeting all Conditions placed on the certificate.

### **3. BACKGROUND TO THE REPORT**

#### **3.1 Assessment Team/Authors**

Dr. Sabine Daume, Program Manager and Team Leader, SCS

Dr. Daume 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 led numerous pre- and full assessments, including the Western Australia Rock Lobster fishery, Australian Icefish fishery and the Australian Lakes & Coorong 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 led research projects related to fishery and fisheries habitats of temperate and tropical invertebrate species. Dr. Daume is also a certified lead auditor under the International Standard Organization (ISO) 9001:2008 certification requirement.

Mr. Alexander "Sandy" Morison, Consultant, Morison Aquatic Sciences

Mr. Morison is a consultant for Morison Aquatic Sciences, a private consulting firm specializing in fisheries and aquatic sciences. He 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. Mr. Morison has participated as part of a team undertaking Marine Stewardship Council pre-assessment for Australian Commonwealth-managed fisheries.

Dr. Ian Knuckey, – Fishwell Consulting Pty Ltd

Ian holds a PhD in fisheries population dynamics and has twenty five years of involvement in temperate and tropical fisheries including both inshore and deepwater scalefish and shark fisheries. Ian has extensive experience with fisheries stock assessments and harvest strategies. He is the Chair of Australia's Northern Prawn Fishery Resource Assessment Group, Shelf Resource Assessment Group of the Southern and Eastern Scalefish and Shark Fishery (SESSF), and the Victorian rock lobster Assessment Group. He is very experienced in the range of data collection and analysis techniques used for input into stock assessments. He is the principal investigator of a number of programs to design and implement fishery independent surveys and scientific monitoring programs. Having designed and lead the Independent Scientific Monitoring Program for the SESSF for many years, Ian has had extensive experience in bycatch monitoring and analysis techniques and bycatch mitigation for trawl fisheries. Ian has conducted and been involved with a number of projects on the development and review of harvest strategies and their application to commercial fisheries, including the Commonwealth harvest strategy policy, the SESSF harvest strategy, the NPF harvest strategy, the small pelagic fishery and developing harvest strategies for data-poor fisheries. Dr. Knuckey's experience is across the many issues associated with harvest strategies that include economic as well as biological targets and reference points to manage fisheries.

Ms. Mary Lack, Shellack Pty Ltd.

Ms. Lack has qualifications in agricultural and resource economics and has over 25 years experience in Australian and international fisheries management. She has been 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 her work with Shellack Pty Ltd., Ms. Lack 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 extensive relevant experience with MSC methodology, particularly in the Australian Antarctic region. She has been involved in pre-assessments, annual surveillances and re-assessments under the MSC standard.

In a supportive role, Adrienne Vincent, Lead Auditor for SCS, conducted the onsite meetings in Hobart, Tasmania. Ms. Vincent is a marine biologist that has worked closely with finfish species of commercial importance including California halibut (*Paralichthys californicus*). After completing her B.Sc. in biology from the University of Oregon she completed an e.M.B. in marine science with the Oregon Institute of Marine Biology and focused on marine species management, estuarine trophic relationships, and plankton distribution based on real time oceanographic conditions. Ms. Vincent thereafter joined the State Managed Finfish Project with the California Department of Fish and Game where she worked on stock assessment and management issues. Vincent managed the hook-and-line and trawl fishery independent sampling (indices of abundance) and by-catch rate surveys as well as halibut movement and age structure studies. Since with SCS, she has been involved with the MSC certifications of US Pacific halibut, US Pacific sablefish and Scotian Shelf shrimp and is a certified lead auditor under the International Standard Organization (ISO) 90011:2008 certification requirement.

### **3.2 Peer Reviewers**

Dr. Indrani Lutchman is responsible for leading IEEP's fisheries program and related activities. She has expert knowledge on the Common Fisheries Policy (over 15 years experience). She also has 20 years experience of fisheries and marine management in international waters including the Caribbean and Antarctica. She leads a range of fisheries policy projects focused on improving fisheries management and linking fisheries science and management to policy making. With specific experience in the implementation of the ecosystem-based approach to fisheries management at the EU and international level specifically in relation to the management of Antarctic marine living resources, she assists in the development of indicators for monitoring fisheries policy performance, including the use of marine protected areas (MPAs), the integration of environmental principles in fisheries management and the use of market-based instruments in the fisheries context. She was the lead researcher executing a wide range of projects for WWF/IUCN UK/International on EU, Antarctic and international fisheries projects including evaluations of North Sea Conference outcomes and new initiatives to control IUU fishing in the Southern Oceans. She has been the environmental representative on UK delegation to CCAMLR since 1990, and has worked closely with the UK and EU and CCAMLR delegations on the development of measures to deter IUU fishing including CCAMLR's Catch documentation Scheme (CDS) and associated measures include the electronic *Dissostichus* catch document and IUU vessel lists. She has also been a peer reviewer for other MSC toothfish assessments.

Mr. Jeff June is Natural Resource Consultant's (NRC) chief scientist for field studies and other projects involving population dynamics and resource and habitat assessment. He also coordinates NRC's work in the rapidly growing field of marine pollution and serves as technical advisor to several government agencies and environmental groups in this area. Part of this work is a lead role in the multi agency, highly publicized Puget Sound Derelict Fishing Gear Removal Program. Prior to joining NRC, Mr. June was a chief research scientist with the National Marine Fisheries Service and had extensive experience in development of commercial

fisheries in South America, Micronesia, and Africa. With a career highlighted by international fisheries development and impact studies, Mr. June has led research into human impacts on benthic habitats worldwide including work on fiber optic cables, oil and gas development and marine debris. He also has experience in marine ecosystem modeling is a member of the American Institute of Fishery Research Biologists. Mr. June conducted the peer review of the MSC certified Icefish fishery located near Heard Island and McDonald Islands.

### 3.3 Summary of Meetings

The sites and people chosen for visits and interviews were based on the assessment team's need to acquire information about the management operations of the fisheries under evaluation. Agencies and their respective personnel responsible for fishery management, fisheries research, fisheries compliance, and habitat protection were identified and contacted with the assistance of the client group and stakeholders.

The assessment team met with managers and scientists on 20<sup>th</sup>-23<sup>rd</sup> June, 2011 in Hobart, Australia. As with all assessments, there are always a number of issues that come to light when reviewing all the information with critical management and scientific personnel. Questions that arose after the both meetings were handled through email and phone calls with the client and any other necessary entities.

**Table 1.** Assessment Meetings Attendees

<b>Name</b>	<b>Role</b>	<b>Affiliation</b>
Adrienne Vincent	Lead Auditor	SCS
Sandy Morison	Assessment Team member	Consultant
Mary Lack	Assessment Team member	Consultant
Ian Knuckey	Assessment Team member	Consultant
Martin Exel	Client Representative	Austral Fisheries Pty Ltd.
Les Scott	Client Representative	Australian Longline Pty Ltd
Rhys Arangio	Client Representative	Austral Fisheries Pty Ltd.
Dr. Malcolm Haddon	Stock status/ harvest strategy	CSIRO
Dr. Gavin Fay	Stock status/ harvest strategy	CSIRO
Dr. Geoff Tuck	Stock status/ harvest strategy	CSIRO
Peter Neave	Management	AFMA
Sarah Reinhart	Compliance	CCAMLR
Lihini Weragoda	Management/ Policy	AAD
Rob Nicoll	Stakeholder	WWF

### 3.4 Submission of Data on the Fishery

One of the most significant, and challenging, aspects of the MSC certification process is ensuring that the assessment team gets a complete and thorough grounding in all aspects of the fishery under evaluation. In even the smallest fishery, this is no easy task as the assessment team typically needs information that is fully supported by documentation in all areas of the fishery from the status of stocks, to ecosystem impacts, through management processes and procedures.

Under the MSC program, it is the responsibility of the applying organizations or individuals to provide the information required proving the fishery or fisheries comply with the MSC standards. It is also the

responsibility of the applicants to ensure that the assessment team has access to any and all scientists, managers, and fishers that the assessment team identifies as necessary to interview in its effort to properly understand the functions associated with the management of the fishery. Last, it is the responsibility of the assessment team to make contact with stakeholders that are known to be interested, or who are actively engaged in issues associated with fisheries in the same geographic region.

#### 4. MACQUARIE ISLAND TOOTHFISH FISHERY

A brief description of the Macquarie Island Toothfish Fishery assessed in this project is provided in the following subsections. The descriptions are general in nature and brief, since a good deal of this information is more fully discussed in Section 11, Assessment Team Performance Evaluations.

##### 4.1 Unit of Certification

The fishery under assessment is the Patagonian toothfish (*Dissostichus eleginoides*) fishery in Australian territorial waters within the Australian EEZ around Macquarie Island. Marine Stewardship Council Principles and Criteria for Sustainable Fishing are applied to the following 2 units of certification:

1. Patagonian toothfish *Dissostichus eleginoides* demersal trawl
2. Patagonian toothfish *Dissostichus eleginoides* demersal longline

##### 4.2 Target Species and Life History

The fishery targets Patagonian toothfish *Dissostichus eleginoides* (Fig. 1). The species is a member of the Family Notothenidae and is one of two species in the genus, Antarctic toothfish (*Dissostichus mawsoni*) being the other. Patagonian toothfish grow to over 2.2 m long and live to a maximum of over 50 years of age. The longevity of Patagonian toothfish, and hence the estimates of growth obtained from otoliths, has been validated using the bomb radiocarbon chronometer and through tag and recapture studies. Sexual maturation occurs between 75 and 80 cm in males and between 97 and 99 cm in females (9-10 years of age).



Fig. 1: Patagonian toothfish, *Dissostichus eleginoides* source: New Zealand Ministry of Fisheries, 2009.

### 4.3 Distribution

The species is widely distributed from the slope waters off Chile and Argentina south of 30–35°S to the islands and shelf areas in sub-Antarctic waters of the Atlantic, Indian and Pacific Ocean sectors of the Southern Ocean. *D. eleginoides* occurs throughout the Campbell Plateau and Tasman Basin, from shallow depths to at least 1,800 m depth around the periphery of the plateau.

### 4.4 Stock Structure

Considerable mitochondrial DNA heterogeneity has been found among populations of *D. eleginoides* from three southern ocean locations: Macquarie Island, HIMI and Shag Rocks/South Georgia. This suggests that the populations are genetically distinct, though there were no significant differences among these populations when comparing seven nuclear microsatellite loci. A further study of populations from the Indian Ocean sector of the Southern Ocean (Crozet Is., Prince Edward and Marion Is. and Kerguelen Is.) did not detect genetic differentiation among these populations. This, combined with results from tagging data, which show movement of some fish over distances greater than 1,000 nm, and crossing oceanic troughs over 4,000 m deep, suggests that a metapopulation of *D. eleginoides* may exist in the Indian Ocean sector.

### 4.5 Migration and Movement

Recaptures of tagged Patagonian toothfish around Macquarie Island have mostly occurred within 10 nautical miles of the tagging site (Williams and Lamb. 1997) but, from a total (up to 2010) of over 1700 recaptures, about 1% of tagged fish have moved from northern to southern fishing grounds and about 6% have moved in the other direction (Fay, 2011). Also, two tagged fish have been recaptured well away from their tagging locations: one fish, captured and released in early 2009 inside the New Zealand EEZ has been recaptured in the Macquarie Island fishing zone in mid 2009, and another fish tagged within the Macquarie Island fishing zone was recaptured from the northern CCAMLR region in the Ross Sea (New Zealand Ministry of Fisheries, 2011). These results indicate that, like other populations of Patagonian toothfish, most adult fish remain resident in a relatively small area but some undergo extensive movements. It is also evidence that Patagonian toothfish found in waters adjacent to Australia's EEZ around Macquarie Island are part of one straddling stock. Genetic studies (Ward *et al.*, 2000) indicate that the Macquarie Island population of Patagonian toothfish is, however, genetically distinct from the population fished around Heard Island and MacDonald Islands, but linkages with populations found closer to Macquarie Island have not been investigated as thoroughly and are less certain. The management arrangements for the fishery have recently been amended to allow the setting of a single TAC for the whole fishery, in recognition of the current belief that there is a single stock of Patagonian toothfish in the Macquarie Island Toothfish Fishery.

### 4.6 Reproduction

Antarctic Notothenid fish typically produce large yolky eggs and mature at about half their maximum length. Spawning occurs from July to September although the location of spawning grounds is unknown. There are some indications that in South Georgia, *D. eleginoides* release their eggs near the slope at depths of 800–1000m (Agnew *et al.*, 1999). Larvae and postlarvae are encountered in pelagic layers around South Georgia (North, 2002) and over the southern part of the Patagonian Shelf (Ciechomski & Weiss, 1976, cited in Garcia de la Rosa *et al.* 1997).

The size at which 50% of fish become sexually mature occurs at 78.5cm +/- 0.5cm total length for male and 98.2 cm +/- 1cm for female fish (Everson and Murray 1999). There is also evidence that a significant proportion of sexually mature fish (25 to 43 %) do not come into spawning condition each year. These sizes correspond to an age of 7-10 years for males and 10-12 years for females.



#### 4.7 Diet

*D. eleginoides* is an opportunistic carnivore whose feeding habits vary with age and depend on the local availability of food items. In the southwest Atlantic, Garcia de la Rosa *et al.* (1997) reported *D. eleginoides* to be a mixed-species carnivore, feeding primarily on fish and secondarily on crustaceans and cephalopods. The diet changes with fish size and with depth as fish grow and move to deeper water, with juveniles feeding pelagically principally on krill in coastal waters and fish making up a larger proportion of the diet as they migrate to deeper waters. Adults are mainly benthic feeders but capable of undertaking feeding migrations to pelagic waters. Around Macquarie Island, toothfish have been found to prey on a broad range of species, including demersal fish and crustaceans and mesopelagic fish and cephalopods, suggesting that they are opportunistic predators (Goldsworthy *et al.* 2001), but here dietary composition was not related to fishing depth or fish size. While information is collected by observers on stomach contents and feed of toothfish, there have been no specific research programs investigating the diets of toothfish in the Macquarie Island area and it is assumed that here, as elsewhere, they are also general carnivores feeding in benthic and mesopelagic habitats.

#### 4.8 Predators

Killer whales (*Orcinus orca*) and sperm whales (*Physeter macrocephalus*) have been observed to remove *D. eleginoides* from commercial fishery long lines around South Georgia Island. Feeding by killer whales in particular can depress longline CPUE by up to 50% (Clark and Agnew, 2010). It is unlikely that *D. eleginoides* also form part of the natural diet of these cetaceans. Killer whales are unable to dive to the lower depths at which long lines are set and at which adult *D. eleginoides* occur and are only capable of stripping long lines as they are harvested closer to the surface. There have been no incidences of killer whale interactions in the Macquarie Island toothfish region to date. The presence of sperm whales is not associated with reduced catch rates to the same extent, although they are thought to gather in areas of high toothfish concentrations in other parts of the world. There have been no incidences of sperm whale interactions in the Macquarie Island toothfish region to date.

#### 4.9 Geographic Setting of the Macquarie Island Patagonian Toothfish Fishery

Macquarie Island is a small sub-Antarctic island about 34 km long and 5 km wide, with an area of 128 km<sup>2</sup>. It is situated about 1,500 km south-south-east of Tasmania, about half way between Tasmania and Antarctica; north of CCAMLR Convention Area 88.1 (Figure 2). Macquarie Island was listed as a UNESCO world heritage site in 1997 because it is the only island in the world where rocks from the earth's mantle are exposed. It is part of the Macquarie Ridge, aligned along the eastern margin of the tectonic plate boundary between the Indo-Australian Plate and the Pacific Plate.

The fishery operates in waters of the Australian Fishing Zone around Macquarie Island and, within this area, the fishery is restricted to waters outside three nautical miles from the island (which are State waters under the control of Tasmania) and outside the Macquarie Island Marine Park (Figure 3).

The main fishing ground of the Macquarie Island region is the Aurora Trough to the west of the island just outside the three nautical mile limit of State waters. The area outside the Aurora Trough is also fished and is referred to as the 'Macquarie Ridge'.

Additional maps in Appendix I show the relationship between Macquarie Island and CCAMLR areas (Figure 4), other Australian jurisdictional zones (Figure 5), and the fishing grounds around Macquarie Island (Figure 6).

## Map of the Macquarie Island Fishery

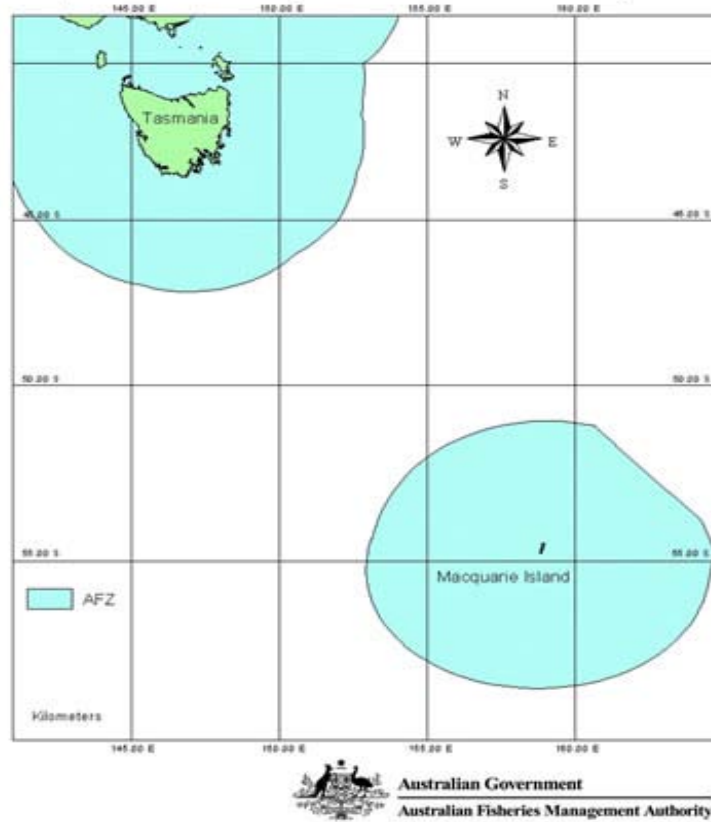


Figure 2. Location of Macquarie Island toothfish fishery and its relation to Australia, New Zealand and CCAMLR areas (from AFMA 2010).

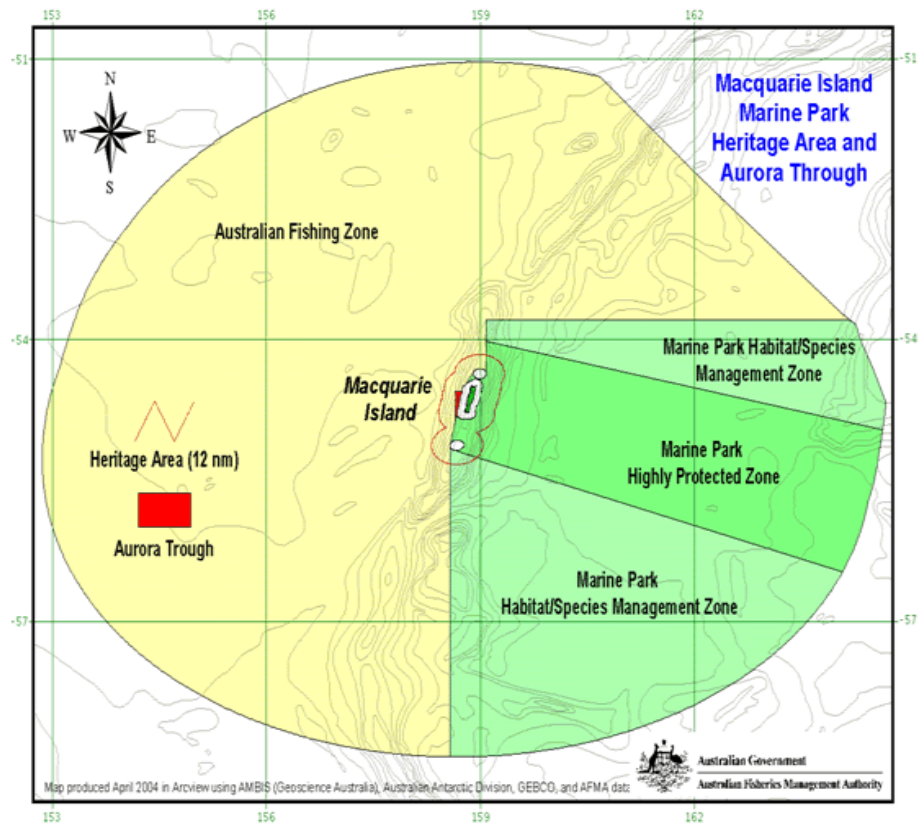


Figure 3. Indicative map showing Macquarie Island Marine Park (green) and fishing sectors (Aurora Trough in red and other areas in yellow). State waters are white.

#### 4.10 Background of the Macquarie Island Patagonian Toothfish Fishery (MITF) and Stock Assessments

The fishery around Macquarie Island commenced in November 1994. The two major fishing grounds discovered are the Aurora Trough and the Macquarie Ridge Northern Grounds region.

This fishery was originally restricted to trawling because of concerns about the potential for hook methods to catch seabirds. A trial of longline methods was allowed to commence in the 2006/07 season and the entire catch is now taken by this method, following approval of online as a fishing method in the fishery.

Total catches have ranged between a low of 18 t and a maximum of just over 1000 t (Table 2). Annual catches of toothfish (both species) from outside the CCAMLR statistical areas adjacent to Macquarie Island (including those for Patagonian toothfish in the MITF) have been less than 450 t (Table 3). These data are reported on a calendar year basis, which complicates the comparison, but nevertheless show that there are minimal catches of toothfish reported from high seas areas adjacent to the area of the MITF.

Patagonian toothfish are also caught within the New Zealand EEZ. The species was introduced to the New Zealand quota management system in October 2010 with a TAC of 50 t but less than 50 t of Patagonian toothfish have been taken in total since 1994/95 from the New Zealand EEZ (New Zealand Ministry of Fisheries, 2011).

The assessment of the Aurora Trough components of the Macquarie Island Patagonian toothfish stock has been based on the tag-recapture model developed by de la Mare and Williams (1997), and modifications described in Tuck et al. (2003). In 2004, an 'integrated' assessment was developed that included information on length-frequency and tagging data in an age-structured model that allowed estimation of annual spawning biomass and

cohort strength (Fay and Tuck, 2011). This model was also able to project the stock into the future under various fixed TAC scenarios in order to provide insights into appropriate TACs and the likely short and long-term impact on mature biomass. This has been further updated to allow for the introduction of the longline sector to the fishery and its potentially greater spatial range and ability to target larger and more mature fish. This updated assessment has also been the subject of management strategy evaluation to test how well the assessment performs given uncertainties in spatial dynamics, movement, biology and mortality rates, how well the harvest strategy performs in terms of meeting management objectives, how robust the harvest strategy is to these uncertainties given the available assessment method, and how the method of obtaining an abundance estimate and the spatial collection of data impacts the harvest strategy (Fay *et al.* 2011). The results of these management strategy evaluation analyses demonstrate that the currently applied control rule in the Macquarie Island toothfish fishery can satisfy management objectives in terms of maintaining spawning biomass at or above target levels, and that the risk of dropping below limit reference levels under such a strategy is low (Fay *et al.* 2011).

The assessment of the Macquarie Ridge component of the stock has been hampered by a lack of data because following some initial high catches in this area, relatively little of the fishing effort is in this area and therefore there have been too few fish tagged and recaptured to allow for a tag-based assessment.

The initial decision rule used for setting the TAC for the Aurora Trough required that at least 66.5% of the original biomass still be available and, if so, the commercial TAC was set at 10% of the estimated biomass available to the trawl fishery. It was found that this rule permitted large (unsustainable) TACs for the commercial fishery for the 1 of every 4 years that the fishery was open (Tuck 2009). The harvest control rule used to set the TAC for the Macquarie Ridge Northern Trawl Ground has been to assume no recruitment to the fishery and then to reduce the previous season's estimate by the catch and one year of natural mortality (Tuck 2009). The harvest control rule was changed to that used by CCAMLR in 2010 for the 2010-11 fishing season (see section 10.1 – PI 1.1.2).

The TAC for the 1996/97 fishing season was based on the catches of the first two fishing seasons and the tagging experiment in the 1995/96 fishing season; the setting of TACs after the 1996/97 fishing season was then based on results from stock assessment models (Tuck 2009) and used the agreed decision rules described above. In years when the results of assessments and decision rules indicated that a zero commercial TAC should be set for the Aurora Trough, a research TAC was set to enable the tag based stock assessments to be undertaken. For the Macquarie Ridge, decision rules allowed TACs to increase within the fishing season if the trawl fishing catch rates exceeded  $10\text{t}/\text{km}^2$  over three consecutive fishing days. If this catch rate dropped below the trigger level, then the TAC fell to the lower TAC. If the lower TAC had been reached without this catch rate trigger being reached then fishing ceased. This trigger level has not been reached since the fishery began. A total allowable catch (TAC) was first introduced for the 1996/97 fishing season. The period covered by the TACs has changed over time (Table 2). The TAC has been separated into amounts allowed for the Aurora Trough and for the Macquarie Ridge. This split in the TAC was introduced following initial indications from the dynamics of the fishery that the Patagonian toothfish found in the Aurora Trough were a separate component of the population to those found on the Macquarie Ridge.

Table 2.. Total Allowable Catch (TAC,) for Aurora Trough (AT, with research allowances in brackets) and and Macquarie Ridge (MR, with trigger TACs in brackets); catches (tonnes) for Patagonian toothfish from the MITF (by fishing year and fleet) and from CCAMLR statistical area 88.1, 1994/95 to 2009/10. NMR - Northern Macquarie Ridge, SMR - Southern Macquarie Ridge. (TACs and trawl catch data from Fay Tuck 2011, L'line catch data from Fay 2011; CCAMLR data from CCAMLR 2010). \* indicates TACs set for the longline trial. No trawling has occurred since the close of the '08/09 season.

Period	TAC		Trawl catch		L'line catch			Total catch	Catch CCAMLR Area 88.1
	AT	MR	AT	MR	AT	NMR	SMR		
94/95			427	<1				427	
95/96			935	<1				935	
1 Sep 96-31 Aug 97	750	1000	489	586				1075	
1 Sep 97 – 31 Dec 98	200	1500	200	397				597	
1 Jan - 31 Dec 99	(40)	600 (1000)	36	26				62	
1 Jan 31 - Dec 2000	(40)	510 (1000)	11	7				18	
1 Jan – 31 Dec 2001	(40)	420 (1000)	23	<1				23	34
1 Jan 31 Dec 2002	(40)	242 (782)	36	3				39	12
1 Jan – 30 Jun 2003	(40)	205 (665)	0	<1				<1	26
1 Jul 03 – 20 Jun 04	354	174 (441)	352	<1				352	13
1 Jul 04 – 30 Jun 05	(60)	148 (376)	57	<1				57	7
1 Jul 05 – 30 Jun 06	255	125 (319)	241	9				250	1
1 Jul 06 – 30 Jun 07	241	100 (264)	238	<1				239	12
1 Jul 07 – 30 Jun 08	390	86*	223	84	5	9	71	392	9
1 July 08 – 30 Jun 09	312	150*	307	150		38	112	607	17
1 Jul 09- 14 Apr 10	(60)*	150*	-	-	69	10	141	431	0
15 Apr 10- 14 Apr 11	140	150*	-	-	132		146	542	

Table 3. Catch history of *Dissotichus* spp from outside the CCAMLR Convention area adjacent to Macquarie Island. [Note that these figures include the catch data for Macquarie Island shown above].

Area	Year									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
81	28	0	40	363	52	402	282	332	442	184

## 5. FISHERY MANAGEMENT SYSTEM

As noted above, the MITF is located entirely within the Australian EEZ and operates in waters between 3nm out to the 200nm boundary of the EEZ around Macquarie Island. Waters out to 3nm are managed by the Tasmanian Government and have been declared as a Nature Reserve under Tasmanian law since July 2000. The MITF is managed by the Australian Fisheries Management Authority (AFMA), in accordance with the *Fisheries Management Act 1991* (FMA). The MITF is outside the Convention Area of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), however, CCAMLR members, such as

Australia, have an obligation, under Resolution 10/XII<sup>1</sup> to “ensure that their flag vessels conduct harvesting of such stocks areas adjacent to the Convention Area responsibly and with due respect for the conservation measures it has adopted under the Convention”. As a result, Australia chooses to apply CCAMLR’s conservation measures to the MITF (AFMA, 2010a). So while CCAMLR is not part of the formal management system for the fishery, relevant conservation measures are applied by AFMA and a brief overview of the nature of CCAMLR’s approach is provided below.

The fishery also lies within the Convention Area of the South Pacific Regional Fisheries Management Organization (SPRFMO). The Convention for this RFMO has not yet entered into force; however Australia is a signatory to the Convention. The Convention Area of the SPRFMO includes only high seas areas. However, should the toothfish stock fished in the MITF be found to straddle areas of the high seas within the Convention Area, Article 20 of the Convention provides for cooperative management arrangements to be developed between Australia and the SPRFMO.

As discussed above, tag recapture data of tagged Patagonian toothfish around Macquarie Island suggest that it is likely that the Macquarie Island population is part of a straddling stock with the fish taken in the adjacent New Zealand EEZ and/or with the toothfish in the northern CCAMLR region in the Ross Sea (New Zealand Ministry of Fisheries, 2011). Patagonian toothfish were introduced to the New Zealand quota management system in October 2010 with a TAC of 50 t but, as noted above, less than 50 t of Patagonian toothfish have been taken in total since 1994/95 from the New Zealand EEZ (New Zealand Ministry of Fisheries, 2011). Likewise, catches of Patagonian toothfish within CCAMLR area 88.1 are not large, having totaled 131 t between 2000/01 and 2009/10 seasons. As a result, neither the management systems associated with the Ross Sea fishery nor New Zealand management systems are considered to be part of the management system for the purposes of this assessment.

## **5.1 Australian Fisheries Management Authority (AFMA)**

AFMA is a commission responsible for day to day management of Commonwealth fisheries, including the MITF. Overarching policy input on fisheries management is provided to the Minister and to the Parliamentary Secretary for Agriculture, Fisheries and Forestry, by the Department of Agriculture, Fisheries and Forestry (DAFF).

AFMA, established in 1992, undertakes the day to day management of the fisheries in the AFZ under the FMA. For administrative purposes, AFMA manages more than 20 fisheries that are identified by species, fishing method and/or area. The Commonwealth model of fisheries management has a number of features that distinguish it from other countries, the most prominent of which is the partnership approach with industry and other stakeholders. Under this model, the involvement of industry is recognized as being vital to successful fisheries management.

AFMA's operations are overseen by nine Commissioners. The Commissioners are appointed on the basis of their high level of expertise in one or more of the fields of fisheries management, fishing industry operations, science, natural resource management, economics, business or financial management, law, and public sector administration or governance. Commissioners cannot hold any executive position in a fishing industry association, nor can they have a controlling interest or executive role in any entity holding a Commonwealth fishing concession. The AFMA commission is responsible for exercising AFMA’s domestic fisheries management functions and powers. The Chief Executive Officer (CEO) is responsible for assisting the

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<sup>1</sup> Available at: [http://www.ccamlr.org/pu/e/e\\_pubs/cm/01-02/res10-XII.pdf](http://www.ccamlr.org/pu/e/e_pubs/cm/01-02/res10-XII.pdf)

commission, including giving effect to its decisions, and for exercising AFMA's foreign compliance functions and powers. The Chief Executive Officer is also a commissioner. Two committees, the AFMA Research Committee and the Environment Committee, report to the Commission. The Audit and Risk Committee reports to the CEO. The outcomes of Commission meetings are reported to stakeholders and the public through the AFMA website.

As part of AFMA's partnership approach to fisheries management, it has established Management Advisory Committees (MACs) for each major fishery that it manages. MACs are AFMA's main point of contact with client groups in each fishery and play an important role in helping AFMA to fulfill its legislative functions and pursue its objectives. The Committees provide advice to the AFMA Commission on a variety of issues, including on-going measures required to manage the fishery, the development of management plans and research priorities and projects for the fishery.

The MACs are intended to complement the work of fishery managers by providing a broader perspective on management options and a wide range of expertise, not dissimilar to that of the Commission. MACs therefore provide a forum where issues relating to a fishery are discussed, problems identified and possible solutions developed. The outcomes of these deliberations determine the recommendations that the MAC will make to the Commission.

AFMA's legislation limits the number of members on a MAC to seven, in addition to the Chairperson and an AFMA officer. Increasingly, and where appropriate, AFMA has included a broader range of interest groups in this consultative process. The Commission decides, on a fishery-by-fishery basis, the range of wider community interests that should be reflected on the MAC. As a general rule, revised membership arrangements are considered upon expiry of terms of appointment of existing members.

The Sub-Antarctic Management Advisory Committee (SouthMAC) is the relevant MAC for the MITF and also applies to AFMA's fisheries around Heard and McDonald Islands (HIMI). This reflects the fact, that AFMA manages both the HIMI fisheries and MITF in accordance with CCAMLR conservation measures. The industry participants are also the same in both fisheries. There are seven statutory members of SouthMAC comprising two from industry, one from the conservation community (currently from the Tasmanian Conservation Trust), a research member (the chair of the Sub-Antarctic Resource Assessment Group (SARAG) – see below), and one from the Australian Antarctic Division (AAD). In addition, there is an AFMA member and an independent Chair. Observers are welcome to attend meetings of the MAC and from time to time students, other industry members and representatives from other environment non-government organizations attend. SouthMAC meets once a year, after the annual CCAMLR meeting, and provides the public forum for ongoing development and adaptation of the management regime for the MITF. The first meeting of SouthMAC was held in November 1998 and the most recent meeting was held in Hobart, Tasmania in December 2010. In addition to the annual meeting, the MAC attends to urgent issues out-of-session via email and phone discussion.

Resource Assessment Groups (RAGs) have been established by AFMA to provide independent advice on fishery and stock status and to achieve transparency in the collection and analysis of data for fisheries management purposes. The MITF stock assessment is reviewed by SARAG which provides advice to SouthMAC and the Commission. SARAG is currently composed of a Chair and eleven members including six government scientists (four from AAD and two from the Commonwealth Scientific and Industrial Research organization (CSIRO)), two industry members, an AFMA member and a representative from the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) and from the Tasmanian Department of Primary Industries, Parks, Water and Environment. Observers also attend these meetings. The RAG meets three times per year and there is considerable commonality of membership across the MAC and

RAG. AFMA is currently conducting a review of how it collects and uses economic and scientific information. This review includes the operations of the RAGs. The draft recommendations of the review do not identify the need for any significant changes to the operation of the MITF.

In addition to the formal consultative mechanisms provided by the MAC and RAG, there is ongoing informal correspondence between the industry members and scientists and managers throughout the year. There are also a number of broader consultative mechanisms that include other government agencies and non-government organizations. These are discussed in more detail in the assessment of the Fishery against Principle 3.

## **5.2 Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)**

The CCAMLR requirements for management of Antarctic marine living resources are well recognized as being the world's leading example of a multi-lateral structure providing an ecosystem-based management framework for fisheries management. In particular, the requirements to make specific allocation of biomass for predators as a measure to protect against impacts of fishing, is a strong feature of the management process.

The principles of conservation governing all harvesting and associated activity in the Convention Area are set out in [Article II of the CCAMLR Convention](#). The three principles can be paraphrased as follows (CCAMLR, 2000):

- (i) prevention of population decline to levels which threaten stable recruitment of harvested species,
- (ii) maintenance of ecological relationships between the harvested, dependent and related species, and
- (iii) minimization of the risk of ecosystem changes that are not potentially reversible in 20-30 yrs.

These guiding principles underpin the essential elements of CCAMLR's approach to management. They encompass both the precautionary and ecosystem approaches.

## **6. FISHERY'S IMPACT ON ECOSYSTEM**

### **6.1 Bycatch - Retained and discarded species**

Bycatch consists of the incidental catch of non-target species that may or may not be landed. Seabirds and marine mammals that may form part of the bycatch or may be affected indirectly by the fishery are considered separately in section 6.3. With 100% observer coverage of all trips, there is generally good quantitative information on all retained and discarded species.

#### **6.1.1. Retained species**

The fishery is managed with a general strategy of "nil discards" to reduce provisioning of seabirds and mammals, but in practice this relates only to retaining all teleost species (which form ~ 90% of bycatch by weight) and most small elasmobranch species. These species are discussed under Principle 2 within the retained species section. The main retained teleost species are whiptails, cods and icefish. Catches of these species are generally less than 5% of the total catch. Occasional small catches of chimaerids and small elasmobranchs are also retained. All retained catches of bycatch species are processed in an onboard fishmeal plant. None of the retained species has particular value to the fishers nor are they particularly vulnerable. There are generally



similar catches of retained species by the trawl and longline components of the fishery. Ecological risk assessments have been undertaken on both sub-fisheries and found there are no target, bycatch, byproduct or protected species considered to be at high risk from the effects of fishing.

The strategy for managing retained species is that vessels do not target any bycatch / byproduct species other than toothfish and a total bycatch limit of 200 t applies to all teleost species, crabs and sharks with a 50 t limit on any one species. These limits have not been breached in any year. To date, the maximum annual bycatch (retained and discarded) across all species has been 41 t and the largest annual catch of any one retained species has not exceeded 7 t. If the limits are breached, the fishery is closed for the remainder of the season.

Approximately 40 t of squid is used for bait during each trip which is sourced from the New Zealand squid fisheries. These fisheries capture two species (*Nototodarus gouldii* and *Nototodarus sloanii*) which are both found across the continental shelf generally in waters less than 300 m depth and are targeted by trawling and jigging. The fishery is managed under quota which was around 130,000 t in 2008.

### **6.1.2. Discarded bycatch species**

Large sharks, and all jellyfish, sponges, crabs, coral and algae are the discarded component of the bycatch but form a negligible part of the overall catch. There is a total bycatch limit of 200 t applies to all teleost species, crabs and sharks with a 50 t limit on any one species. As mentioned above, these limits have not been breached in any year.

There are virtually no instances where the bycatch of any one species is >5% of the total catch by weight or to have value to the fisher or particular vulnerability. Generally the discarded bycatch of any particular species or species group caught by either trawl or longline is less than 500kg in any year (<1%). One exception is the bycatch of Southern Sleeper Shark, *Somniosus antarcticus*, which is an extremely large dogshark that gets caught very occasionally by both trawl and longline methods. These large sharks are released from longlines or trawls if captured, but the survival rate of sharks once they are released is uncertain. Many of the corals, jellyfish, sponges and algae form a very minor component of the bycatch but they are not identified to species level.

## **6.2 Endangered, Threatened and Protected (ETP) species**

The ETP species that potentially interact with this fishery include seabirds, dolphins, fur seals, and elephant seals. There is 100% observer coverage of all trips but observers have reported minimal interactions with any ETP species. In numerous years of 100% monitoring of trawl vessels, no bird was seen to sustain serious injury or die from an interaction and there has been only one incident where a juvenile male southern elephant seal was found dead in a trawl net. Longline vessels comply with the Threat Abatement Plan for seabirds and exceed international requirements and there have been no mortalities from this method.

Although outside the region of CCAMLR, the MITF is managed in accordance with the Conservation Measures adopted by CCAMLR. Fishing operations in the MITF are also fully compliant with the 'Recovery Plan for Threatened Albatrosses and Giant Petrels' and 'Sub-Antarctic Fur Seal and Southern Elephant Seal Recovery Plan.' A keystone to the management of the fishery's interaction with ETP species is the ban on discarding any bycatch or offal that may attract or encourage foraging of birds or seals around the vessel, but this is augmented with specific bycatch mitigation measures appropriate to the different fishing methods, a 3 nm closure to any fishing around Macquarie Island and an extensive MPA that covers more than a third of the EEZ around the island.

### 6.2.1. Indirect interactions with ETP species

There has been an extensive investigation of trophic interactions between toothfish, its fishery, seals and seabirds around Macquarie Island that concluded there was little predation on toothfish by seals or seabirds, or prey competition between toothfish and other marine predators. It was found there were only weak trophic linkages between toothfish, its fishery and seabirds and seals around Macquarie Island.

## 6.3 Ecosystem

Macquarie Island lies north of the Antarctic Convergence a region where cold, northward-flowing Antarctic waters of the Antarctic Polar Front meet the relatively warmer waters of the sub-Antarctic Front (NOO, 2002). The Antarctic Polar Front moves seasonally and sometimes reaches Macquarie Island, causing a marked drop in surface water temperature. It not only separates two hydrological regions, but also separates areas of distinctive marine life associations and of different climates. The Antarctic waters predominantly sink beneath sub-Antarctic waters, but the mixing of these water masses creates a zone of very high marine productivity, especially for Antarctic krill. Associated with this foodweb are squid, and a range of mesopelagic-, bathypelagic- and benthopelagic fishes and top order predators consisting mainly of seals and birds. Resident seal species include the southern elephant seal, *Mirounga leonina*, Antarctic fur seal *Arctocephalus gazella* and New Zealand fur seal *A. forsteri*, and the subantarctic fur seal *A. tropicalis* is present on the island from December to October. Main seabirds include the king, *Apenodytes patagonicus*, royal, *Eudyptes schlegeli*, rockhopper *E. chrysocome* and gentoo *Pygoscelis papua* penguins, the Macquarie shags *Phalacrocorax purpurascens* and the black-browed albatross *Diomedea melanophrys*, northern *Macronectes halli* and southern *M. giganteus* giant petrel and Antarctic prion *Pachyptila desolata*, are present in the vicinity of the island during the breeding and moulting periods.

### 6.3.1. Habitats

Closed areas are the main method used to protect habitats, although trawl gear has a minimum bobbin size of 520 mm and where rockhopper gear is used, rubber discs of minimum size of 40 cm apply. The Tasmanian State waters surrounding Macquarie Island out to three nautical miles are classified as a nature reserve and closed to fishing. Outside of State waters, the Macquarie Island Marine Park covers 162,000 km<sup>2</sup> (~ 34%) of the EEZ around the island. The Macquarie Island Bioregional Province encompasses ~477,000 km<sup>2</sup> and the geomorphic units consist of canyons, deep escarpments, knolls, ridges, trenches, slope and abyssal plains. All of these geomorphic units are represented in the MPA. The Aurora Trough sector of the MITF is the main trawl ground where the majority of the catch is taken and represents <1% of the EEZ (AFMA 2010a). The Macquarie Ridge component of the fishery covers a much larger area but there is relatively little fishing that occurs within this area.

There is a basic understanding of the main habitat types in the area of the fishery and information is available to broadly understand the main impacts of the gear. There is poor information available on the marine habitat structure on a scale relevant to the fishery. This is being addressed to some extent by a current 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’ but this project had not been finalized at the time of this assessment.

### 6.3.2. Trophic relationships

A comprehensive study of the trophic interactions between toothfish, its fishery, seals and seabirds around Macquarie Island found that the seal and seabird communities around the Macquarie Island prey primarily on pelagic fish and crustaceans, neither of which forms important prey of toothfish nor are they targeted by the fishery (Goldsworthy *et al.* 2001). The conclusion of this study was that there was “...little predation on toothfish by seals or seabirds, or prey competition between toothfish and other marine predators”. There was

almost no direct overlap between the fishery and prey species consumed by major marine predators. Only weak trophic linkages were found between toothfish, its fishery and seabirds and seals around Macquarie Island”. This work was adequate to determine that the fishery was unlikely to disrupt key elements underlying the ecosystem.

## **7. TRACKING AND TRACING OF FISH AND FISH PRODUCTS AND TARGET ELIGIBILITY DATE**

Traceability of product from the sea to the consumer is vital to ensure that the MSC standard is maintained. There are several aspects to traceability that the MSC requires to be evaluated: Traceability within the fishery; at-sea processing; at the point of landing; and subsequently the eligibility of product to enter the chain of custody.

### **7.1 Traceability within the Fishery**

For the toothfish fishery, all landings are recorded and reported. The monitoring, control and surveillance system in place in the toothfish fishery comprises;

- in-port monitoring of Australian port unloads by an AFMA authorised officer(s) to ensure compliance
- unloads of Australian Toothfish vessels outside of Australia are monitored by AFMA to ensure the vessels compliance with the reciprocal Port State measures as contained in CCAMLR Conservation Measure 10-03 in addition to AFMA issuing the relative Port State a ‘port access letter’ confirming that the product has been taken legally and in compliance with all CCAMLR conservation measures. In - port monitoring of overseas unload verification and validation is also undertaken by Port State authorised officers to ensure compliance with CCAMLR catch documentation requirements.
- completion of the CCAMLR toothfish Catch Documentation Scheme (CDS) paperwork for unloading and export of all toothfish product (which is done electronically by government officials from the flag state, port state and import/export states to avoid any illegal substitution of toothfish);
- completion of shot-by-shot daily logbooks and submission of that data to AFMA, AAD and CCAMLR in accordance with Conservation Measures 23-01 and 23-02
- 100% observer coverage providing shot by shot biological, ecological and management information on the fishery (including specific tasks for monitoring vessel compliance, any interactions with seabirds or marine mammals, fishery bycatch and target species biology);
- Automatic Satellite Vessel monitoring system to record the position of the boats at all times from departure from port until return to port, to ensure the boat has not fished in any regions closed to fishing (these data are provided directly to both AFMA and CCAMLR for monitoring purposes with the Catch Documentation Scheme).

### **7.2 Eligibility to Enter Chains of Custody**

At the writing of this report, toothfish landed by any of the registered vessels (Austral Leader II, Janas, Southern Champion and Antarctic Chieftain) as they harvest using either of the two gear types (demersal trawl and demersal longline) and process at sea, are eligible to seek and secure MSC chain of custody certification in order to sell product derived from the fishery with the MSC claim. Chain of custody starts at the port of landing.

### **7.3 Points of Landing**

Macquarie Island toothfish is landed predominantly at Port Nelson, New Zealand and Port Louis in Mauritius, with some additional landings in Devonport, Tasmania, Australia.

## **7.4 At-Sea Processing**

All toothfish from this fishery is processed and frozen at sea. In some cases further grading and packing of the product is performed in a registered export facility on shore.

The Total on Board (TOB) summary sheet contains information on all product hauled and processed per day with a running total on board count as well. This summary is broken down by product form as follows:

HGT - Grade, In the case of Janas the product is landed H&G tailed on shore at grade and packed out (as the Antarctic Chieftan/ Janas do not bag fish at sea), number of bags (for Southern Champion and Austral Leader II), product weight, conversion factor and gross weight.

Collars - Size, # of boxes and average box weight

Additionally, Fish to Galley, offal and “to crew” are recorded and validated by observers, and deducted from the quota allocation.

Conversion Rates (TARE) are controlled by regulatory mechanisms between the client and the Australian Fisheries Management Agency (AFMA). As live weights of hauled fish are not kept for every fish caught, this agreed TARE allows the vessel to derive gross weight of catch from processed weights (as every processed fish is weighed) and report this to AFMA which is then used to determine how much to apply towards the TAC. Note the AFMA observer on the boat checks and determines the Conversion rate factor to be applied by random sampling of live weight to processed weights during every trip, and reports the conversion results performed to both CCAMLR and AFMA in the Observer report.

## **7.5 Risk of Vessels Fishing Outside the Unit of Certification**

When fishing in the Macquarie Island fishery, vessels do not fish in other locations during that trip unless prior approval has been provided by AFMA. Transshipment does not occur in the fishery. There are a number of pieces of evidence that establish the location where fishing has taken place. These consist of:

1. Line records for each line (or trawl records for each trawl) noting when line/ trawl was shot and location and number of fish hauled. These are hand written and then transferred to an electronic log, and verified by the observers as well as positions cross validated by the satellite monitoring system. Data is sent to CCAMLR every ten days, and monthly.
2. Electronic Dissostichus Catch Document (EDCD) created for every trip contains, amongst other information, a field for Area Caught, Vessel, Species, Declared Weight, Scaled Weight, dates vessel fished, etc. This record is signed off by a representative from the company (eg Austral Fisheries) and by the authorized officer in the port of unloading (eg the Ministry of Fisheries in Mauritius if unloaded there, or AFMA officers if unloaded in Australia).
3. Master's Declaration signed by the Captain declares the location of fishing and confirms that the vessel has not called at any other port.
4. Vessel Monitoring System (VMS) data exists for every trip recording positions of the boats regularly (at minimum several times daily) from the time the boat leaves port, until the boat returns to port.
5. Where the boat fishes in a second area during a single trip, the fish are separated in the fish hold by secure netting, verified and validated by the AFMA observer. This is then taken into account when unloading takes place by the authorized officers, with weights and quantities validated for each of the separate regions.
6. There are always two full time observers on any trip to the fishery, recording positions, catch, biological information, seabird and marine mammal sighting and verifying the accuracy of vessel reporting requirements.

## **7.6 Risk of Substitution at Landing**

Unload happens at the dock in Nelson, New Zealand in most instances. Toothfish are unloaded into metal bins and then fork lifted onto a scale. Weights are recorded by three persons: (1) a representative of fishing vessel owner, (2) a representative from the port facilities and (3) a representative from the Fisheries Department of New Zealand. These weights must precisely match on each record. Once weighed, product is placed inside pre-arranged containers (or on-shore cool store facilities for further processing and packing) that are already assigned to individual buyers. The container weight that product is put in is also recorded by authorities. With respect to onshore processing, the weight is also verified and reported to CCAMLR on dispatch (i.e., matching verified unload weight with sales weight).

Once each container has been filled, that container is sealed with a boltseal solid pin that bears a unique seal number which prevents the container from being opened again and fish being substituted or removed, prior to its arrival at the final destination.

Containers remain on the dock (under power), until the three records are finalized and signed off by an authorized Fisheries Department of New Zealand or Australian representative. This process is identical in Mauritius, with the exception that the port state authority that validates and signs off as verified would be from the Mauritius Fisheries Department.

## **7.7 Target Eligibility Date**

The target eligibility date for the Macquarie Island toothfish Fishery, the date from which product from a certified fishery is eligible to bear the label if the fishery is certified, will be the certification date.

## **8. OTHER FISHERIES IN THE AREA**

There are no other toothfish fisheries near Macquarie Island.

## **9. MSC PRINCIPLES AND CRITERIA**

### **9.1 MSC Principle 1 – Stock Status and Harvest Strategy**

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.

Intent:

The intent of this Principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favor of short term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

MSC Criteria:

1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.

3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

## **9.2 MSC Principle 2 – Ecosystem**

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.

Intent:

The intent of this Principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

MSC Criteria:

1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
2. The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimizes mortality of, or injuries to endangered, threatened or protected species.
3. Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

## **9.3 MSC Principle 3 – Management**

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.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

MSC Criteria:

A. Management System Criteria:

1. The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.

The management system shall:

2. demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishing-dependent communities shall be addressed as part of this process;
3. be appropriate to the cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedures for implementation and a process for monitoring and evaluating performance and acting on findings;
4. observe the legal and customary rights and long term interests of people dependent on fishing for food and livelihood, in a manner consistent with ecological sustainability;
5. incorporates an appropriate mechanism for the resolution of disputes arising within the system;

6. provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing;
7. act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty;
8. incorporate a research plan – appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interested parties in a timely fashion;
9. require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted;
10. specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:
  - a) set catch levels that will maintain the target population and ecological community's high productivity relative to its potential productivity, and account for the non-target species (or size, age, sex) captured and landed in association with, or as a consequence of, fishing for target species;
  - b) identify appropriate fishing methods that minimize adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
  - c) provide for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames;
  - d) have mechanisms in place to limit or close fisheries when designated catch limits are reached;
  - e) establish no-take zones where appropriate;
11. contain appropriate procedures for effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specify corrective actions to be taken in the event that they are.

#### B. MSC Operational Criteria:

Fishing operations shall:

12. make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimize mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive;
13. implement appropriate fishing methods designed to minimize adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
14. not use destructive fishing practices such as fishing with poisons or explosives;
15. minimize operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.;
16. be conducted in compliance with the fishery management system and all legal and administrative requirements; and
17. assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

### 9.4 Interpretations of MSC Principles for Performance Assessments

Along with developing a standard for sustainable fisheries management, the MSC also developed a certification methodology that provides the process by which all fisheries are to be evaluated. Accreditation Services International (ASI) accredits certification bodies that can show that the expertise and experience necessary to carry out MSC evaluation is present in the organization. In addition, each certification body must demonstrate its fluency with the MSC standards and evaluation methods through the use of these in a fishery evaluation

The methods are provided in great detail through documents that can be downloaded from the MSC website ([www.msc.org](http://www.msc.org)). The Fisheries Assessment Methodology (FAM) Version 2.1, released 1 May 2010 is being used for the assessment of the fishery.

The MSC Principles and Criteria are general statements describing what aspects need to be present in fisheries to indicate that they are moving toward sustainable management. The certification approach or methodology adopted by the MSC requires that any assessment of a fishery or fisheries move beyond a management verification program that simply provides third-party assurances that a company's stated management policies are being implemented. The MSC's 'Certification Methodology' is designed to be an evaluation of a fishery's performance to determine if the fishery is being managed consistent with emerging international standards of sustainable fisheries.

## 10. ASSESSMENT TEAM FISHERY PERFORMANCE EVALUATIONS

After completing all the reviews and interviews, the assessment team is tasked with utilizing the information it has received to assess the performance of the fishery. Under the MSC program, an Assessment Tree is determined for this task. The proposed Assessment Tree is made available for public comment for a period of 30 days. All comments are considered and the Assessment Tree revised where appropriate. The finalized Assessment Tree is used to evaluate the performance of the fishery. Unless determined unsuitable for the particular fishery, the MSC Default Assessment Tree is used whereby the weighting of the Performance Indicators is pre-determined. In this assessment the Default Assessment Tree, FAM v.2.1 was used. Each PI has three associated Scoring Guideposts (SG) set at 60, 80 and 100. The SGs have specific elements that must be met for the fishery to get at least a partial score for the particular SG. Each PI under each Principle is weighted so that each of the three Principles is equal to one another. If a fishery scores less than 60 for any PI, it is excluded from certification. The process requires that all team members work together to discuss and evaluate the information they have received for a given performance indicator and come to a consensus decision on the scores. The mean of the weighted scores are used to get overall scores for each of the three MSC Principles. A fishery must have normalized scores of 80 or above on each of the three MSC Principles to be recommended for certification. Should an individual PI receive a score of less than 80, a 'Condition' is established that when met, would bring the fishery's performance for that indicator up to the 80 level score representing a well-managed fishery.

Below is a written explanation of the assessment team's evaluation of the information it received and the team's interpretation of the information as it pertains to the fishery's compliance with the MSC Principles and Criteria.

### 10.1 MSC Principle 1

**A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.**

1.1.1		
The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.		
SG 60	SG 80	SG 100



It is <u>likely</u> that the stock is above the point where recruitment would be impaired.	It is <u>highly likely</u> that the stock is above the point where recruitment would be impaired. The stock is at or fluctuating around its target reference point.  The stock is at or fluctuating around its target reference point.	There is a <u>high degree of certainty</u> that the stock is above the point where recruitment would be impaired.  There is a <u>high degree of certainty</u> that the stock has been fluctuating around its target reference point, or has been above its target reference point, <u>over recent years</u> .
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**Score: 100**

### **1.1.1 Scoring Rationale**

The status of Patagonian toothfish stock around Macquarie Island was most recently estimated using an integrated assessment that is implemented with Stock Synthesis software (Fay 2011, Fay et al. 2011). This two-area model replaced the previous tag-based assessment model versions which had been used for fishery assessments and provided for better representation of the ongoing spatial and temporal changes of the fishery. It was applied in setting the TAC for the Aurora Trough for the first time in 2010/11 using data up to June 2010.

The inputs to this assessment were length composition data from the fishery (1994/95-2009/10), conditional age-at-length data (1997-2000, 2003, 2005, 2008), and the results of the tag-release-recapture program, begun during the 1995/96 season. The tagging data, therefore, continue to be a key data source that informs the model. The model designated five different fleets: Aurora Trough trawl, Northern Valley Trawl, Aurora Trough longline, and Northern and Southern Macquarie Ridge longlines. The latter two fleets were separated at latitude 54.25 degrees south which represents a geographical break in the location of fishing operations. In the final version of the assessment model the selectivity of the longline fleet in the northern and southern Macquarie Ridge was given a logistic form rather than the original dome-shaped selectivity pattern following advice from SARAG. Aging error was incorporated into the assessment using the error matrix calculated for the assessment of Patagonian toothfish for Heard Island and McDonald Islands. Sex-specific parameters for the growth curve were estimated outside the model but alternatives were explored that included estimating most of the growth curve parameters within the model and holding the values fixed at an alternative set of parameter values obtained from fits to the growth increment data available from the tag recaptures at Macquarie Island.

Revised parameter values, model structure and data that SARAG agreed to for the 2011 assessment:

- a) Fixed natural mortality of  $M=0.13 \text{ yr}^{-1}$ .
- b) The estimation of the growth curve parameters within the model, except for  $L_{\infty}$  for females which was fixed at 165cm.
- c) Length at 50% maturity of 139cm, as estimated from longline fishing data at Macquarie Island.
- d) Annual recruitment deviations from the stock recruitment relationship were estimated over the period 1985-2003.
- e) Steepness is fixed at  $h=0.75$ .
- f) Logistic selectivity for the Macquarie Ridge longline fleets.
- g) An update of the length data.

An increase in the size at maturity (to 139 cm from 89 cm) and the change in selectivity to a logistic form (from the previously used dome-shape selectivity) both act to make the assessment more conservative. The first change reduces the proportion of the stock that is considered to be mature and the second change implies that large fish remain vulnerable to fishery. Both changes reduce the catch levels that could meet the harvest control rules.

The two-area version of the assessment model has been accepted by SARAG as the most plausible representation of stock dynamics for Patagonian toothfish at Macquarie Island. This approach assumes that the fisheries in the Aurora Trough and the northern valleys target separate components of the toothfish population but that there are linkages between them. The extent of those linkages is reflected in the rates of movement between them that are estimated within the assessment from the tagging and recapture data. The two area model makes no specific assumption about the presence of resident and transient components of the northern valley's population that were postulated to be present early in the history of the fishery as a possible explanation for an observed decline in the availability of fish in this area – a decline that was considered too large to have been due to fishing alone (Tuck et al. 1997). The two area model was found to fit the tag-recapture data well, and accounts for the observed rates of movement between the northern and southern areas better than a single area model (which overestimates the rate of movement by assuming uniform mixing within the area) or a two stock model (which does not allow for any movement).

This model was fitted to all of the data from both sectors of the fishery using a single population model. It estimated the stock to be at 72% of unfished levels in 2011/12 (Figure 7). This value is slightly lower than the 78% estimated by the preliminary base case assessment (Fay, 2011) that was found to include some erroneous data and to which SARAG recommended the other changes in model structure, data and parameters noted above. Sensitivity analyses conducted using a range of different assumptions to the preliminary base case assessment produced estimates of depletion between 65% and 82% (Fay, 2011). These sensitivity analyses were not repeated for the final base case assessment but are nevertheless likely to be indicative of the relative sensitivity of the final base case to similar changes in model assumptions or parameters.

A separate assessment for the Aurora Trough was also presented although SARAG is of the view that fish found on the Aurora Trough and Macquarie Ridge are likely to be from the same stock. This assessment predicted that depletion for the Aurora Trough would be 58% of unfished levels in 2011/12 (Figure 7).

Given the potential for the Macquarie Island population to be part of a straddling stock, it would be prudent for the assessment to consider the potential impacts of fishing outside the Australian EEZ. None of the assessment scenarios, however, explicitly consider the potential impact of fishing in adjacent international waters, in the New Zealand Exclusive Economic Zone to the north or in CCAMLR area 88.1 further to the south. Patagonian toothfish has been targeted by New Zealand-based vessels in international waters north of Sub-area 88.1 (Horn 2002). Patagonian toothfish were introduced to the New Zealand quota management system in October 2010 with a TAC of 50 tonnes but less than 50 t of Patagonian toothfish have been taken in total since 1994/95 from the New Zealand EEZ (New Zealand Ministry of Fisheries 2011). Catches of Patagonian toothfish within CCAMLR area 88.1 are not large, having totaled 131 t between 2000/01 and 2009/10. Catches from international waters have been small compared to those from the MITF (see Section 4.10). Although it seems unlikely that there are opportunities for catches of Patagonian toothfish to increase significantly in these areas, the catch taken from all areas that are likely to be from the same stock should be monitored and included in the assessment when warranted.

Projections of stock status and estimation of future catches that would comply with the prescribed harvest control rules require the allocation of assumed catches to the northern and southern areas. Assessments used a 50:50 split as the base-case and a 70:30 split between these areas as an alternative scenario. SARAG has previously agreed that the maximum catch that should be taken from Aurora Trough is 150t and all stock and catch projections assume that this limit remains in place. The maximum total catch that met the CCAMLR control rules using a 50:50 catch distribution between north and south was 486 t (150 t in the Aurora Trough and 168 t in each of the other two areas). Using a 70:30 catch distribution the maximum total catch was 510 t (150 t in the Aurora Trough, 252 t in the North and 108 t in the South). There is little difference in the predicted

biomass trajectories under these different assumptions of the distribution of catches (Figure 7). The 70:30 catch distribution was used for setting the 2011/12 TAC at 510 t.

These projections also require an assumption about the gear that will take these future catches as the selectivity differs between trawl and longlines. The projections anticipate a switch to longlines for the future fishery, whereas previous projections (Fay and Tuck 2011) examined projections assuming catches by either trawl or longline. The differences in selectivity mean that higher catches are obtainable which still meet the harvest control rules if future catches are taken purely by longline.

Uncertainty in the assessment has been examined both by sensitivity analyses that explore the influence of changes to key model parameters or weights given to different data sources, and by applying Markov Chain Monte Carlo methods to the agreed base case to provide posterior distributions for estimates of biomass and depletion.

The sensitivity analyses show that the assessment is most sensitive to the estimates of natural mortality and growth, both of which can be affected by the representativeness of the data obtained from the tagging program. The tagging data are particularly important as the model relies on the estimate of fishing mortality they allow and there is no index of abundance used. There are relatively few recaptures from the northern area so the size of the component of the stock in this area is not well estimated and neither are the movement rates between areas. There is an interaction between the estimation of movement rates and other components of the model that requires further investigation (Fay 2011).

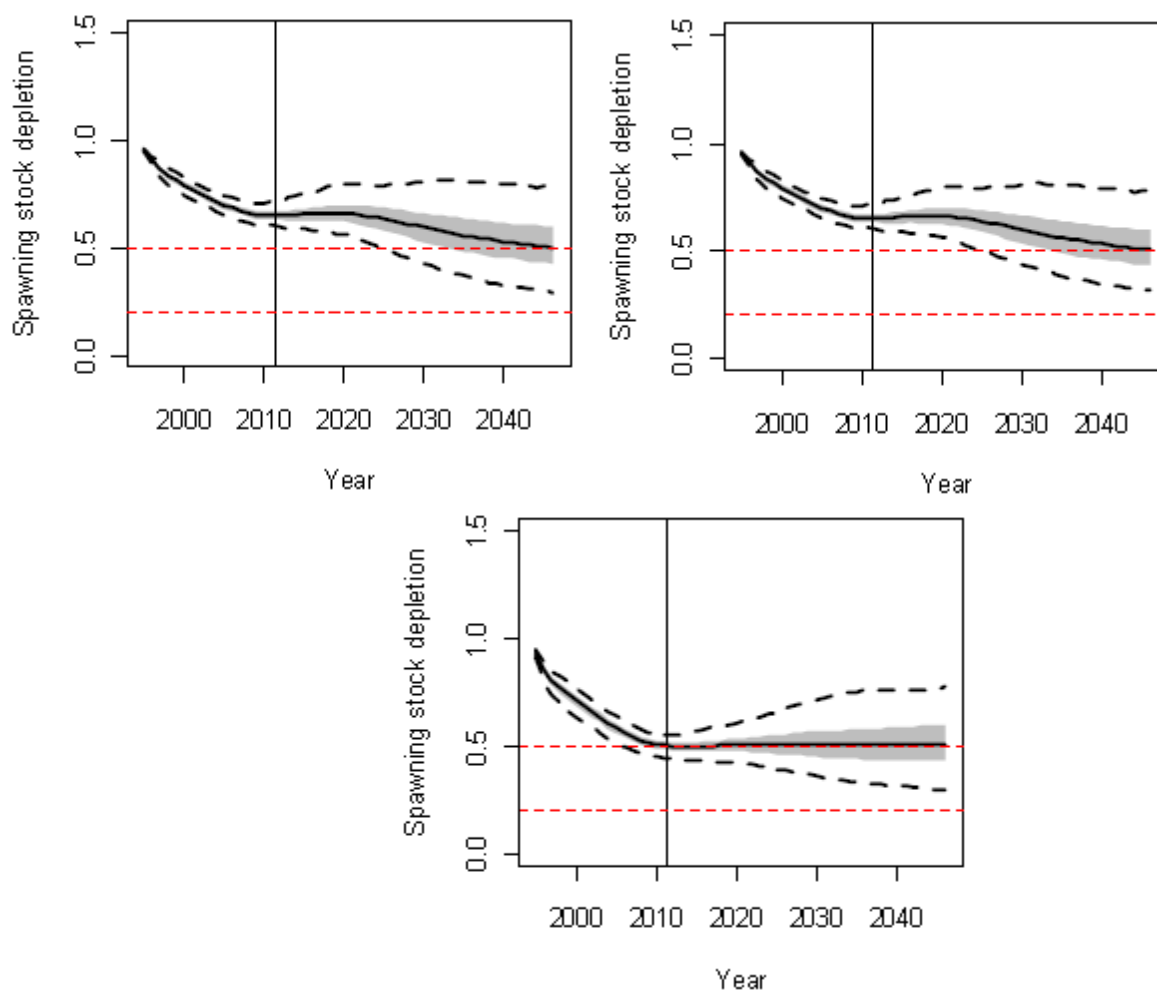


Figure 7. Posterior distribution and projection of spawning biomass relative to the unfished level using the 2 area model (top) and the Aurora Trough only (bottom). The 2 area model assumes a constant catch of 150 t for Aurora Trough and either a 50:50 split between the two Macquarie Ridge areas (top left) or a 70:30 split (top right). (From Fay et al. 2011).

### Assessment against the Scoring Guides (SG)

The assessment team concluded that, despite some ongoing uncertainties in the assessment, the fishery for Patagonian toothfish at Macquarie Island meets the requirements for both elements of the SG100 level as there was a “high degree of certainty that the stock is above the point where recruitment would be impaired” and “a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years”. This is based on consideration of the following information.

- The base case assessment and the range of plausible estimates of current depletion levels are all above the target reference point and the point where recruitment would be impaired.
- The most recent estimated stock trajectories which indicate that the stock, while declining from fishing, has always been above target levels.
- The precautionary nature of the decision rules, which makes it highly unlikely that regulated fishing could deplete the stock.
- The complete observer coverage for the fishery, which mitigates the likelihood that reported catches are erroneous.
- The record which shows that regulated fishing has never exceeded the prescribed catch limits.
- The absence of IUU fishing, which reduces the potential of there being unaccounted fishing mortality.

### 1.1.1 Trace References

Fay (2011), Fay and Tuck (2011), Fay *et al.* (2011), Horn (2002), NZ Ministry of Fisheries, (2011), Tuck *et al.* (1997), Ward *et al.* (2000), Williams and Lamb (1997).

1.1.2		
Limit and target reference points are appropriate for the stock.		
SG 60	SG 80	SG 100
<u>Generic</u> limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	<p>Reference points are appropriate for the stock and can be estimated.</p> <p>The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.</p> <p>The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome.</p> <p>For low trophic level species, the target reference point takes into account the ecological role of the stock.</p>	<p>Reference points are appropriate for the stock and can be estimated.</p> <p>The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of relevant <u>precautionary issues</u>.</p> <p>The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome, <u>or a higher level</u>, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.</p>

**Score: 100**

### 1.1.2 Scoring Rationale

There are two reference points used in the calculations of TACs for Patagonian toothfish.

Escapement reference point 1: median escapement of the spawning biomass at the end of a 35 year projection period is 50% of the median pre-exploitation level.

Depletion reference point 2: ensure that the probability of the spawning biomass dropping below 20% of its median pre-exploitation level is less than 10% over the projection.

The level of escapement is calculated as the proportion of samples from the Bayesian posterior distribution where the predicted future status of the SSB was below 50% of the pre-exploitation median spawning biomass at the end of a 35-year projected period.

The depletion probability is calculated as the proportion of samples from the Bayesian posterior distribution where the predicted future SSB was below 20% of the pre-exploitation median spawning biomass in any one year, for each year over a 35-year projected period.

The allowable catch is set at the lower of the two catch levels estimated to satisfy these reference points.

Although they are not identified as such the first reference point is essentially a target reference point and the second a limit reference point.

These reference points have been specifically constructed to meet the objectives of CCAMLR. Although based on reference points originally designed for krill they have been specifically adapted to be appropriate for Patagonian toothfish as a large predator that is unlikely to constitute much of the diet of seals and birds, by reducing the target biomass from the 75% of unfished levels to 50% (Constable *et al.* 2000). The choice of a 35 year reference period as the basis for projections is reasonable for a species with a maximum age in excess of 50 years. These reference points have been applied to Patagonian toothfish in the Heard Island and MacDonald Islands fishery and SARAG agreed to apply them to the Macquarie Island fishery in 2010.

Precaution is built in to the reference points and decision rule in three ways. Firstly, the choice of the target of 50% of un-fished levels is conservative, being above the 40% level generally recognized as the best default estimate of the biomass at maximum sustainable yield ( $B_{MSY}$ ) and the default level that is set in Australia's Commonwealth Harvest Strategy Policy (CHSP). Secondly, the use of constant catch projections in both reference points will produce more conservative catches than projections that allow updating of catches to reflect any forecast changes in biomass over the projection period. Thirdly, the choice of a long projection period for evaluating catches that will only apply for one year is precautionary because the range of projections will progressively widen and this uncertainty in turn requires a lower constant catch to meet the limit reference point in particular.

The second (limit) reference point is also consistent with the CHSP in which 20% of unfished levels is the default biomass at which stocks are considered to be at an unacceptable risk. Stocks are required to be maintained above this level with a 90% probability.

### **Scoring Assessment against SGs**

The chosen reference points are more than just generic reference points. They are appropriate to the species category. They therefore clearly meet the requirements of the SG60 level. Both reference points are also consistent with CCAMLR objectives (although, being for a fishery that is entirely within the Australian EEZ, they are not required to be) and can be estimated, thus meeting the requirements of the first element of the SG80 level. The second (limit) reference point is set above the level at which there should be any risk of impairing reproductive capacity, thus meeting the requirements of the second element of the SG80 level.

The first (target) reference point should maintain the stock above  $B_{MSY}$ , thus meeting the requirements of the third element of the SG80 level.

The fourth element of SG80 is not relevant to this assessment as Patagonian toothfish is not a low trophic species.

The assessment team identified no precautionary issues that are not taken into account in the choice of the limit reference point. The first element of the SG100 level is therefore met.

The target reference point is precautionary and takes account of the trophic level of the species with a high degree of certainty. The second element of the SG100 level is therefore also met, justifying a score of 100.

### **1.1.2 Trace References**

Constable *et al.* (2000).

### 1.1.3

Where the stock is depleted, there is evidence of stock rebuilding.

SG 60	SG 80	SG 100
Where stocks are depleted rebuilding strategies which have a <u>reasonable expectation</u> of success are in place.  Monitoring is in place to determine whether they are effective in rebuilding the stock within a <u>specified</u> timeframe.	Where stocks are depleted rebuilding strategies are in place.  There is <u>evidence</u> that they are rebuilding stocks, or it is highly likely based on simulation modeling or previous performance that they will be able to rebuild the stock within a <u>specified</u> timeframe	Where stocks are depleted, strategies are <u>demonstrated</u> to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the <u>shortest practicable</u> timeframe.

**Score: N/A**

Up until 2009 the fishery operated under a harvest control rule that recommended the TAC to be 10% of the available biomass, but a commercial catch was only allowed if the biomass was above a limit reference point of 66.5% of the unfished available biomass. Under this decision rule, the then developmental trawl fishery in the Aurora Trough was closed from 1999 to 2003, and again in 2004-05 when the estimated biomass fell marginally below this reference level. This closure of the fishery could be interpreted as indicating that the stock had become depleted. This reference point, however, was a highly precautionary one that has since been shown to lead to frequent closures of the fishery (Tuck 2009). A different decision rule is now used that, while also maintaining stocks at target levels, does not lead to frequent fishery closures. The annual Fishery Status Reports from the ABARES have never listed Macquarie Island Patagonian toothfish as being overfished or subject to overfishing (Wilson *et al.* 2010). The knowledge of the stock and the assessment approach have both improved, making such an interpretation of little current relevance. The harvest strategy has also changed to one which adjusts catches more gradually in response to changed assessments of stock status. Furthermore, the most recent assessment uses updated data on size at maturity (among other differences) and estimates the spawning biomass to have declined gradually over the period of the fishery but to have never fallen below target levels. The assessment team therefore considers that the Macquarie Island stock of Patagonian toothfish is not depleted and, by current estimates, has never been so.

The MSC Certification Requirements, for Performance Indicator 1.1.3 indicate that it shall only be scored when the Principle 1, Stock Status PI 1.1.1 reveals that a stock is depleted, meaning that it “is consistently below the target reference point, and which may be approaching the point at which recruitment is impaired” (MSC, 2011). The assessment for PI 1.1.1 is that Macquarie Island Patagonian toothfish are not below the target reference point and that it is highly likely that the stock is above the point where recruitment would be impaired. Therefore this PI is not scored.

#### **1.1.3 Trace References**

MSC (2011); Tuck (2009); Wilson *et al.* (2010)

### 1.2.1

There is a robust and precautionary harvest strategy in place.

SG 60	SG 80	SG 100
<p>The harvest strategy is <u>expected</u> to achieve stock management objectives reflected in the target and limit reference points.</p> <p>The harvest strategy is <u>likely</u> to work based on prior experience or plausible argument.</p> <p><u>Monitoring</u> is in place that is expected to determine whether the harvest strategy is working.</p>	<p>The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <u>work together</u> towards achieving management objectives reflected in the target and limit reference points.</p> <p>The harvest strategy may not have been fully tested but monitoring is in place and <u>evidence</u> exists that it is achieving its objectives.</p>	<p>The harvest strategy is responsive to the state of the stock and is <u>designed</u> to achieve stock management objectives reflected in the target and limit reference points.</p> <p>The performance of the harvest strategy has been <u>fully evaluated</u> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.</p> <p>The harvest strategy is <u>periodically reviewed and improved</u> as necessary.</p>

#### **Score: 100**

#### **1.2.1 Scoring Rationale**

The harvest strategy that is used for the Macquarie Island Patagonian toothfish Fishery is designed to meet stock management objectives and its elements work together to achieve this. The strategy is also responsive to the state of the stock, as catch limits are determined based on a range of data sources that will reflect stock status. The management objectives that the harvest strategy is designed to achieve are articulated in the precautionary approach that was adopted by CCAMLR in the mid-1990s and include the objective of maintaining a stock at a proportion of its pre-exploitation abundance such that:

1. escapement of the spawning stock must be sufficient to avoid the likelihood of declining recruitment, and
2. abundance under exploitation must maintain a sufficient resource for the needs of dependent species (usually predators).

The second of these objectives is not relevant to Patagonian toothfish which is itself a top predator.

The adoption of a relatively low exploitation rate with a high degree of certainty, indicates that the elements of this harvest strategy are designed to achieve these objectives. As such the requirements of the first elements of the SG60, SG80 and SG100 levels are met.

The harvest strategy used for Macquarie Island Patagonian toothfish has been fully evaluated (Fay and Tuck 2011) and there is evidence, from results of ongoing stock assessments, that it is maintaining the spawning stock at a level that would avoid the likelihood of declining recruitment. The monitoring of stock status and the fishery is sufficient to determine whether the harvest strategy is working and also provides evidence that it is achieving its objectives. This meets the requirements of the second elements of the SG100 level.

The harvest strategy has been reviewed by SARAG and this group recommended it be changed to its current form in 2009. The revised harvest strategy complies with the requirements of Australia's Harvest Strategy



Policy which was introduced in 2007. Thus, the requirements of the third element of the SG100 level are also met and justifies a score of 100.

### 1.2.1 Trace References

Fay and Tuck, (2011)

1.2.2		
There are well defined and effective harvest control rules in place.		
SG 60	SG 80	SG 100
<p><u>Generally understood</u> harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.</p> <p>There is <u>some evidence</u> that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.</p>	<p><u>Well defined</u> harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.</p> <p>The <u>selection</u> of the harvest control rules takes into account the <u>main</u> uncertainties.</p> <p><u>Available evidence indicates</u> that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p>	<p>The <u>design</u> of the harvest control rules take into account a <u>wide</u> range of uncertainties.</p> <p><u>Evidence clearly shows</u> that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.</p>

**Score: 90**

### 1.2.2 Scoring Rationale

The harvest control rules now in place for Macquarie Island Patagonian toothfish are well defined, consistent with the harvest strategy, and will act to reduce the exploitation rate as the limit reference point is approached. They are also designed to take into account a wide range of uncertainties. The stochastic projections used for the implementation of harvest control rules incorporate both parameter uncertainty and uncertainty in future recruitment events (Fay *et al.* 2011). This therefore meets the requirements of the first elements of the SG60 level, the first and second elements of the SG80 level and the first element of the SG100 level.

The available evidence indicates that the TAC has never been exceeded and therefore that the tools used to implement these harvest control rules (including mandatory logbooks and 100% observer coverage) are effective in controlling the exploitation level from this fishery to required levels. This therefore meets the requirements of the second elements of the SG60 level and the third element of the SG80 level.

The assessment team, however, considered that the evidence does not clearly show that the required levels of exploitation are being achieved because of the uncertainty in some key outputs from the stock assessment, arising from some aspects of the tagging program mentioned under PI 1.1.1 above. These uncertainties mean that exploitation levels actually achieved are not clearly demonstrated. The third element of the SG100 level is therefore not considered to be met, and a score of 90 is assigned.

An additional (but currently minor) issue with the assessment is that catches taken in other fisheries that are likely to be from the same stock of Patagonian toothfish are not currently accounted for in the Macquarie Island toothfish assessment. Up to now, these catches have been small and would have had a minor impact on the assessment. The stock of Patagonian toothfish that is fished by the MITF apparently extends into the adjacent high seas areas, the NZ EEZ and the northern areas of the Ross Sea. There is currently little fishing in these areas, however, and the results of previous exploratory fishing efforts in these areas, management controls from New Zealand as well as CCAMLR on those regions, and current knowledge of seafloor bathymetry would suggest that there is little likelihood of new concentrations of Patagonian toothfish being discovered outside the current fishery. This situation needs to be monitored, however, and if catches in the New Zealand fishery become a significant proportion of the total catch, it is recommended that they need to not only be included in the assessment but, more particularly, also taken account of when making projections for TAC setting purposes under the harvest control rules.

**Recommendation:**

Catches in other fisheries that are likely to be from the same stock should be monitored and, if they become a significant proportion of the total catch, they are not only included in the assessment but also taken account of when making projections for TAC setting purposes.

**1.2.2 Trace References**

Fay *et al.*, (2011)

1.2.3		
Relevant information is collected to support the harvest strategy.		
SG 60	SG 80	SG 100
<p><u>Some</u> relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.</p> <p>Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.</p>	<p><u>Sufficient</u> relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.</p> <p>Stock abundance and fishery removals are <u>regularly monitored at a level of accuracy and coverage consistent with the harvest control rule</u>, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.</p> <p>There is good information on all other fishery removals from the stock.</p>	<p>A <u>comprehensive range</u> of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available.</p> <p><u>All information</u> required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent <u>uncertainties</u> in the information [data] and the robustness of assessment and management to this uncertainty.</p>

**Score: 90**

**1.2.3 Scoring Rationale**

Information provided to the assessment team in the form of published papers, reports from AFMA and CSIRO, AAD and CCAMLR (AFMA 2010a, Fay 2011, Fay *et al.* 2011), and the results of discussions with assessment experts, indicate that there is sufficient relevant information available to support the harvest strategy. This meets

the requirements for the first elements of the SG60 and SG80 levels. The range of information available is not considered to be comprehensive because the data collected have not yet resolved some of the important uncertainties around stock structure (including the relationships with Patagonian toothfish found in adjacent waters) and stock productivity (including the uncertainties from the previously observed periods of high availability in the Aurora Trough). The first element of the SG100 level is therefore not considered to be met.

All the information required by the Harvest Control Rule is monitored annually and it was readily apparent to the assessment team that those involved in the scientific aspects of the assessment process have a good understanding of the inherent uncertainties in the data that are collected and used. There is excellent information available on all fishery removals from the stock which, with the exception of the small catches taken within the adjacent high seas areas, the New Zealand EEZ, and the northern part of the Ross Sea, are exclusively taken by the fleets seeking certification. IUU fishing, which has been a significant problem for some Antarctic high seas fisheries, is not regarded as an issue for Patagonian toothfish in the area around Macquarie Island. The second element of the SG60 level, the second and third elements of the SG80 level, and the second element of the SG100 level are therefore considered to be met.

As the fishery meets the requirements of all but one element at the SG100 level a score of 90 is warranted on this PI.

### 1.2.3 Trace References

AFMA (2010a), Fay 2011, Fay *et al.* (2011)

1.2.4		
There is an adequate assessment of the stock status.		
SG 60	SG 80	SG 100
<p>The assessment estimates stock status relative to reference points.</p> <p>The major sources of uncertainty are identified.</p>	<p>The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points.</p> <p>The assessment takes uncertainty into account.</p> <p>The stock assessment is subject to peer review.</p>	<p>The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.</p> <p>The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.</p> <p>The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.</p> <p>The assessment has been <u>internally and externally</u> peer reviewed.</p>

**Score: 95**

### 1.2.4 Scoring Rationale

An integrated assessment model was used to estimate stock status and provides estimates of current biomass and current biomass relative to reference points based on unfished levels. Stochastic projections of this

assessment are used to identify future catches which are consistent with the reference points. This clearly meets the requirements for the first element of the SG60 level.

The major sources of uncertainty have also been identified and are recorded in the assessment reports and the minutes of SARAG. This meets the requirements for the second element of the SG60 level.

The form of the assessment is the same as used for other similar stocks (albeit with different data inputs). It is appropriate for the stock and for the harvest control rule, it takes into account the major features relevant to the biology of the species and the nature of the fishery and therefore meets the first element of the SG80 and SG100 levels.

The assessment takes into account a range of types of uncertainty that have been identified. It explores the sensitivity of outputs to a range of plausible values for model parameters and makes projections that also consider such uncertainties. The stochastic projections are evaluating stock status relative to reference points in a probabilistic way and therefore meet the requirements of the second element of the SG100 level.

The assessment has been formally tested through a Management Strategy Evaluation (Fay and Tuck 2011) although this work is ongoing. The current form of assessment and model structure has been adopted after the previous assessment model (based on a simpler tagging model) had been developed and applied. Alternative hypotheses about stock structure and movement have been rigorously explored to the extent possible with the available data. The requirements for the third element of the SG100 level are therefore met.

The assessment is regularly reviewed by SARAG and by internal CSIRO processes. This review process meets the requirements of the third element of the SG 80 level but is considered by the assessment team to be an internal process only. It is therefore not considered sufficient to meet the requirements of the fourth element of the SG100 level.

The assessment team considered that, by meeting the requirements of three of the four elements of the SG100, a score of 95 was warranted.

## References

Constable et al. (2000); Fay (2011); Fay and Tuck (2011); Fay, Tuck and Haddon (2011); Horn (2002); Ministry of Fisheries (2011); Tuck et al. (1997); Tuck 2009; Ward et al. (2000); Williams and Lamb 1997 ; Wilson, Curtotti and Vieira 2010.

## 10.2 MSC 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.**

### 2.1.1

The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.

**SG 60**

**SG 80**

**SG 100**

<p>Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.</p> <p>If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.</p>	<p>Main retained species are <u>highly likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.</p>	<p>There is a <u>high degree of certainty</u> that retained species are within biologically based limits.</p> <p>Target reference points are defined and retained species are at or fluctuating around their target reference points.</p>
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<b>2.1.1</b>	<b>Trawl</b>	<b>Longline</b>
<b>Score</b>	<b>90</b>	<b>90</b>

### 2.1.1 Scoring Rationale:

The fishery is managed with a general strategy of “nil discards” to reduce provisioning of seabirds and mammals, but in practice this relates only to retaining all teleost species (which form ~ 90% of bycatch by weight) and most small elasmobranch species. These are the groups that will be dealt with in this retained species section (2.1). Large sharks, and all jellyfish, sponges, crabs, coral and algae form a negligible part of the overall catch but are usually discarded; these will be considered under the bycatch section (2.2).

The main retained teleost species are whiptails (e.g. *Macrourus holotrachys*, *Macrourus carinatus*, *Macrourus whitsoni*, and *Coryphaenoides suberrulatus*), cods (*Antimora rostrata* and *Halargyreus johnsonii*) and an icefish (*Lepidonotothen squamifrons*). Occasional small catches of chimaerids and small elasmobranchs are also retained. All retained catches are process in an onboard fishmeal plant. The status of these species is poorly known but there are measures in place that can be expected to result in the retained species being within biologically based limits; thereby meeting both of the SG60 Elements.

To be considered as a “main” retained species under MSC, species need to comprise >5% of the total catch by weight or to have value to the fisher or particular vulnerability. There has been only one year where the catch of any retained species has been greater than 5% of the total catch: the longline catch of a whiptail (*Macrourus whitsoni*) was 4.9 t during 2006/07 representing 5.2% of the total catch. This is a very small catch of a species that has a wide circumpolar distribution in the Southern Ocean (Cohen et al. 1990) outside the main Macquarie Island fishing grounds. As such, it is highly unlikely that catches would take the species outside biological limits and there is a strategy with demonstrably effective management measures to ensure this remains the case, meeting the Elements of SG80. None of the retained species has particular value to the fisher (it is usually reduced to fishmeal) nor are they particularly vulnerable.

The bait that is used by longline gear is also assessed under this section. Approximately 40 t of squid is used for bait during each trip which is sourced from the New Zealand (Exel pers comm.) squid fisheries. These fisheries capture two species (*Nototodarus gouldii* and *Nototodarus sloanii*) which are both found across the continental shelf generally in waters less than 300m depth and are targeted by trawling and jigging. The New Zealand squid fishery is managed under quota which was around 130,000 t in 2008. Based on the biology of squid and the long term sustainability of the New Zealand squid fishery, the use of about 40 t of product from this fishery will not have a detrimental effect on the source populations.

With respect to all retained species considered under SG100, an initial ecological risk assessment of the byproduct species from the trawl sub-fishery used a productivity and susceptibility analysis to highlighted 40

potentially high risk byproduct/bycatch species but noted that this was largely due to missing information — poorly documented taxonomy and distribution. Further, the report noted that most byproduct species were only caught in small numbers and those “that were most likely to be at genuine high risk within this group were whiptails and southern flounders” (Daley et al. 2008). Subsequently, once the management arrangements of the fishery were taken into account through residual risk assessment, the 40 potentially high risk species was reduced to zero (AFMA 2009a, 2009b). The ecological risk management report (AFMA 2009b) concluded that “there are no target, bycatch, byproduct or protected species considered to be at high risk from the effects of fishing in the MITF demersal trawl sub-fishery given the suite of management and conservation initiatives that are in place for the fishery”. Based on this result, the trawl sub-fishery was considered to meet the first Element of SG100.

Longlining was introduced into the fishery during 2006/07 and this was the sole method used during 2009/10 and 2010/11. It is important to note that longlines catch a generally similar species composition as the trawl with the notable positive exception that longlines have not had the high bycatch of algae (See 2.2). The same management approach with the same limits has been adopted as for the demersal trawl sub-fishery. Fifty six species were analysed in a sustainability assessment (Zhou and Fuller 2011) and no species were found to be at high risk. The ecological risk management report for this sector of the fishery (AFMA 2011) concluded “that there are no target, bycatch, byproduct or protected species at high risk from the effects of fishing by the MITF demersal longline fishery given the suite of management and conservation initiatives that are in place for the fishery”. Based on this result, the longline sub-fishery was considered to meet the first Element of SG100.

The overall lack of reference points for any retained species determines that neither the longline or trawl sub-fisheries can achieve the second Element of SG100.

### 2.1.1 Trace References

AFMA (2009a); AFMA (2009b); AFMA (2010a); AFMA (2011); Cohen et al. (1990); Daley et al. (2008); Zhou et al. (2007); Zhou and Fuller (2011)

### 2.1.2

There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.

SG 60	SG 80	SG 100
<p>There are <u>measures</u> in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.</p> <p>The measures are considered <u>likely</u> to work, based on plausible argument (eg,</p>	<p>There is a <u>partial strategy</u> in place, if necessary that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.</p> <p>There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or species involved.</p>	<p>There is a <u>strategy</u> in place for managing retained species.</p> <p>The strategy is mainly based on information directly about the fishery and/or species involved, and <u>testing</u> supports <u>high confidence</u> that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being <u>implemented successfully</u>, and intended changes are occurring.</p>

general experience, theory or comparison with similar fisheries/species).	There is <u>some evidence</u> that the partial strategy is being <u>implemented successfully</u> .	There is some evidence that the strategy is <u>achieving its overall objective</u> .
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2.1.2 Score	Trawl	Longline
	90	90

### 2.1.2 Scoring Rationale:

There is a strategy in place for managing all retained species that meets Element 1 of SG100. Central to this strategy is that vessels only target toothfish and a total bycatch limit of 200t applies to all teleost species, crabs and sharks with a 50 t limit on any one species (AFMA, 2010). These limits have not been breached in any year. If the limits are breached, the fishery is closed for the remainder of the season.

The strategy is based on information directly about the fishery and there is some information available on the major retained species (eg. Laptikhovsky, 2005; van Wijk et al. 2002 on *Macrourus carinatus*). Retained catches of individual species have been well below the 50t limit stipulated in the strategy, but there has been no formal testing of the strategy to verify its effectiveness if catches of any one species regularly approach limit. Given there is no targeting of species other than toothfish, this scenario is unlikely but until this testing is conducted, there cannot be “high confidence” that the strategy will work. For this reason, both sub-fisheries do not achieve Element 2 of SG100.

To date, the maximum annual bycatch (retained and discarded) across all species has been 41 t (derived from Australian Antarctic Division confidential data as figures in AFMA 2010a appear incorrect), which occurred from trawling during 2008/09 and is obviously much lower than the 200t limit. The largest annual catch of any one retained species has not exceeded 7 t. With 100% observer coverage of all trips, there is clear evidence that the strategy is being implemented successfully and adhered to; meeting Element 3 of SG100.

The squid used as bait in the longline fishery comes from a New Zealand fishery conducted under quota management. Catches have been well below the TACCs over the last decade. Because of the short life span and rapid growth of arrow squid, it is not possible to calculate reliable yield estimates from historical catch, nor estimate the biomass prior to the fishing season.

There is some evidence that the strategy is achieving its overall objective. As mentioned previously, both ecological risk management reports (AFMA 2009b, AFMA 2011) concluded that there were no target, bycatch, byproduct or protected species considered to be at high risk from the effects of fishing in the MITF given the suite of management and conservation initiatives that are in place for the fishery. The fishery therefore meets Element 4 of SG100.

### 2.1.2 Trace References

AFMA (2009b); AFMA (2011); van Wijk et al. (2002); Laptikhovsky (2005),

### 2.1.3

Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.

SG 60	SG 80	SG 100
<p><u>Qualitative information</u> is available on the amount of main retained species taken by the fishery.</p> <p>Information is <u>adequate</u> to <u>qualitatively</u> assess outcome status with respect to biologically based limits.</p> <p>Information is adequate to support <u>measures</u> to manage <u>main</u> retained species.</p>	<p><u>Qualitative information</u> and some quantitative information are available on the amount of main retained species taken by the fishery.</p> <p>Information is <u>sufficient</u> to estimate outcome status with respect to biologically based limits.</p> <p>Information is adequate to support a <u>partial strategy</u> to manage <u>main</u> retained species.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</p>	<p>Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.</p> <p>Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a <u>high degree of certainty</u>.</p> <p>Information is adequate to support a <u>comprehensive strategy</u> to manage retained species, and evaluate with a <u>high degree of certainty</u> whether the strategy is achieving its objective.</p> <p>Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.</p>

2.1.3 Score	Trawl	Longline
	85	85

### 2.1.3 Scoring Rationale:

Through the 100% observer coverage (e.g. AFMA 2009c), there is extensive, quantitative information available on retained species which meets all Elements of the SG60 and SG80.

The observer data are comprehensive for both fishing gears, accurate down to the species level in most cases, and verifiable. Although identified to species level, there are wholesale changes in the Macrourid species in the same sub-fishery from one year to the next and uncertainties in Macrourus identification have been highlighted (Williams, 2010). Given that Macrourids form the bulk of the retained byproduct for both sub-fisheries, further efforts should be made to improve the identification of retained whiptail species. Until this is done, the fishery cannot achieve Element 1 of SG100 and achievement of Elements 3 and 4 are subsequently undermined.

Information on the consequences for the status of affected populations is available from ecological risk assessments of the demersal trawl and longline sub-fishery. These assessments analyze all of the retained species (including all identified Macrourid species) and are not overly sensitive to the small levels of change in catches noted here, whether because of misidentification or not. The information is therefore considered sufficient to support the ERA analysis of risk at species level and meets Element 2 of SG100.

More regular, comprehensive and detailed analysis and reporting of the data are required before an evaluation whether the strategy is meeting the objective with a high degree of certainty. It is not clear how often ecological risk assessments will be undertaken for the fishery but, if this is not done regularly, then alternative detailed analysis and reporting of the retained species catch (and catch rate) is required on an annual basis. Presently, information provided in the annual report on the fishery is lumped into the major taxonomic groups (fish,



sharks, invertebrates) and this cannot be used to effectively monitor the management strategy. Such analysis and information is easily provided (as was done by request for this MSC assessment) but there needs to be a formalized process incorporated as part of the annual assessment and reporting of the fishery. It is not clear from the information provided as to how the strategy is implemented in real time during the season, with respect to the detection and notification of the breach of any trigger limit. It is unclear whether the data on cumulative annual catches are analyzed at the end of a trip or at the completion of each shot. Finally, without any fishery independent information, it is probably warranted to have additional analyses of catch rates (rather than just catches) in order to help better inform the understanding of trends in relative abundance of the retained species. Based on the above, the high degree of certainty required under Element 3 of SG100 is not achieved.

The catch composition of each shot/haul is fully monitored and recorded by either weight and/or number (depending on the species/taxon) and is of sufficient detail to assess ongoing mortalities to all retained species. The observers also collect biological samples on key target and other retained species (gonad, otoliths, size etc.). Combined, this level of information would certainly be adequate to support a comprehensive strategy to manage retained species, except for the question of Macrourid species identification. This issue alone prevents the achievement of Element 4 of SG100.

There is good catch and effort information on the New Zealand squid fishery from which bait for the MITF longliners is sourced. It is not known whether New Zealand squid stocks have ever been stressed through fishing mortality. The amount of squid used in the MITF is negligible (40t) compared to the overall catch levels of 60,000 – 80,000 t and is not considered to pose a risk to the resource.

### 2.1.3 Trace References

AFMA (2009c); Williams (2010).

2.2.1		
The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.		
SG 60	SG 80	SG 100
<p>Main bycatch species are <u>likely</u> to be within biologically based limits, or if outside such limits there are mitigation <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding.</p> <p>If the status is poorly known there are measures or practices in place that are expected result in the fishery not causing the bycatch species to be biologically based limits or hindering recovery.</p>	<p>Main bycatch species are <u>highly likely</u> to be within biologically based limits or if outside such limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> mitigation measures in place such that the fishery does not hinder recovery and rebuilding.</p>	<p>There is a <u>high degree of certainty</u> that bycatch species are within biologically based limits.</p>

2.2.1	Trawl	Longline
Score	90	90

### 2.2.1 Scoring Rationale:

Large sharks, and all jellyfish, sponges, crabs, coral and algae form a negligible part of the overall catch but are usually discarded; these groups are considered under this section on bycatch.

Similar to the retained species, there are virtually no instances where the bycatch of any one species is of sufficient quantity to be classified as a “main” bycatch species under the MSC criterion of it being >5% of the total catch by weight or to have value to the fisher or particular vulnerability. Generally the discarded bycatch of any particular species or species group caught by either trawl or longline is less than 500kg in any year (<1%) and therefore the fishery cannot be considered to pose a risk of serious or irreversible harm to these bycatch species or species groups. This, together with the bycatch strategy, ensures that bycatch species are highly likely to be within biologically based limits, thereby meeting all the elements of SG60 and SG80.

There are only two exceptions to the above that are discussed below and impact on the achievement of SG100 elements.

1) The Southern Sleeper Shark, *Somniosus antarcticus*, is an extremely large dogshark that gets caught very occasionally by both trawl and longline methods. These large sharks are released from longlines or trawls if captured, but the survival rate of sharks once they are released is uncertain. Longline may score better due to cutting the line to release. Sleeper Sharks often weigh well in excess of one ton for an individual. While they don't get caught in sufficient quantity to get classified as a “main” bycatch species by weight (they often account for between 1-3% of the total catch weight in any year), they are considered to have particular vulnerability, due to being “one of the slowest growing cartilaginous fishes” (Hansen 1963 cited in Wijk et al. 2003). Because of the concern about vulnerability, the 50 t trigger does not apply to this species, nor is it included in the 200t overall cap. Concern about this species vulnerability was addressed by van Wijk et al. (2003) through a semi-qualitative risk assessment and comparison with a similar species in the northern hemisphere. Their conclusion was that at present catch rates, the risk to sleeper sharks in the MITF was not likely to be serious. They further recommended that if annual catches exceeded a precautionary number (eg. 20) for a period of two years then the situation should be reviewed. Sleeper sharks were one of the high risk species in the initial ecological risk assessment (Daley et al. 2008) but the subsequent residual risk assessment (AFMA 2009a) reduced it to medium risk using an ‘expert override’ option after further input by Australian Antarctic Division and CSIRO scientists. The reason for the override was based on the recommendations of Wijk et al. (2003) and that the large Marine Protected Area (MPA) of 162,000 km<sup>2</sup> compared to the main trawl grounds in the Aurora Trough of only 130 km<sup>2</sup>, noting that the habitat and species are also represented in the MPA. In line with the recommendations of Wijk et al. (2003), if the MITF catch of Sleeper Sharks increases, this will trigger an immediate review to determine new risk levels (AFMA 2011).

2) The maximum annual total bycatch recorded for this fishery was 41 t, which occurred from trawling during 2008/09 when more than 23t, (7% of total annual catch) of unidentified algae was caught in the net and discarded. A similar occurrence has not happened either before or after this year, nor is it actually possible with the use of longline gear. Although the algae remains unidentified and there are no detailed descriptions of the apparently unusual circumstances that led to its capture this event seems to have been an anomaly and is therefore excluded from further analysis here.

Many of the corals, sponges and algae form a very minor component of the catch but they are not identified to species level and cannot be included at the species level in the ERAs. There has been specific risk assessments on sleeper sharks (which appear to be the most vulnerable of the bycatch species and species groups) and specific management measures are in place. Because of this, there is a high degree of certainty that some but not all bycatch species are within biological limits. A score of SG90 has therefore been applied.

### 2.2.1 Trace References

AFMA (2009a); Van Wijk et al. (2003)

### 2.2.2

There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations.

SG 60	SG 80	SG 100
<p>There are <u>measures</u> in place, if necessary, which are expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.</p> <p>The measures are considered <u>likely</u> to work, based on plausible argument (e.g general experience, theory or comparison with similar fisheries/species).</p>	<p>There is a <u>partial strategy</u> in place, if necessary, for managing bycatch that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.</p> <p>There is <u>some objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or the species involved.</p> <p>There is <u>some evidence</u> that the partial strategy is being implemented successfully.</p>	<p>There is a <u>strategy</u> in place for managing and minimising bycatch.</p> <p>The strategy is mainly based on information directly about the fishery and/or species involved, and testing supports <u>high confidence</u> that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring.</p> <p>There is some evidence that the strategy is achieving its objective.</p>

2.2.2 Score	Trawl	Longline
	95	95

#### 2.2.2 Scoring Rational:

There is a strategy in place for managing all bycatch species which is basically the same as for the retained species other than toothfish. Based on targeting any bycatch / byproduct species, there is a total bycatch/byproduct limit of 200t for all teleost species, crabs and sharks with a 50 t limit on any one species (AFMA 2010a). These limits have not been breached in any year. If the limits are breached, the fishery is closed for the remainder of the season. This meets the requirements for the first element of the SG 100 level.

Although catches of individual species have been well below the 50t limit stipulated in the strategy, there has been no formal testing of the strategy to verify its effectiveness even if catches of any one species regularly approach this limit. Given there is no targeting of species other than toothfish, this scenario is unlikely but until this testing is conducted, there cannot be “high confidence” that the strategy will work. The second element of the SG 100 level is therefore not met.

The trawl ERA states in the text that sleeper shark specific bycatch rules will be developed but the ERM doesn’t make any reference to making any management recommendations.

With 100% observer coverage of all trips and no records of any breaches to this strategy, there is clear evidence that the strategy is being implemented successfully and adhered to. This meets the requirement for the third element of the SG 100 level.

There is some evidence that the strategy is achieving its overall objective. Again, ecological risk management reports for both the trawl and longline sub-fisheries (AFMA 2009b, AFMA 2011) concluded that there were no target, bycatch, byproduct or protected species considered to be at high risk from the effects of fishing in the MITF given the suite of management and conservation initiatives that are in place for the fishery. This meets the requirements of the fourth element of the SG 100 level.

As three of the four elements of the SG 100 level are met for both the trawl and longline sectors a score of 95 is justified.

### 2.2.2 Trace References

AFMA (2009b); AFMA (2011)

### 2.2.3

Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.

SG 60	SG 80	SG 100
<p><u>Qualitative information</u> is available on the amount of main bycatch species affected by the fishery.</p> <p>Information is <u>adequate to broadly understand</u> outcome status with respect to biologically based limits.</p> <p>Information is adequate to support <u>measures</u> to manage bycatch.</p>	<p><u>Qualitative information and some quantitative information</u> are available on the amount of main bycatch species affected by the fishery.</p> <p>Information is sufficient to estimate outcome status with respect to biologically based limits.</p> <p>Information is adequate to support a <u>partial strategy</u> to manage main bycatch species.</p> <p>Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</p>	<p><u>Accurate and verifiable information</u> is available on the amount of all bycatch and the consequences for the status of affected populations.</p> <p>Information is <u>sufficient</u> to quantitatively estimate outcome status with respect to biologically based limits with a <u>high degree of certainty</u>.</p> <p>Information is adequate to support a <u>comprehensive strategy</u> to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective.</p> <p>Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.</p>

2.2.3 Score	Trawl	Longline
	85	85

### 2.2.3 Scoring Rationale:

The observer data is comprehensive for both fishing gears, but is only accurate down to the species level for sharks and higher order invertebrates. Coral, jellyfish, sponge and algae are most often not identified to species level. This is understandable due to the difficulty in identification and the generally very low catches of these groups, particularly on longline. Through the 100% observer coverage there is quantitative information available on discarded species which is of generally good quality and meets all the elements of the SG60 and

SG80, but the lack of identification down to species level for all bycatch precludes achievement of element 1 of SG100.

Information from ecological risk assessments on the consequences for the status of affected populations under current management strategies (AFMA 2009b; 2011) is only available where identification is to the species level and it has been conducted specifically for Sleeper Sharks. The generally low catches of coral, jellyfish, sponge and algae, however, and the considerable protection offered by State closures and Commonwealth MPAs suggests negligible consequences for the status of affected populations regardless of the lack of taxonomic detail but it cannot be considered to be at a high degree of certainty, so element 2 of SG100 is not achieved.

The monitoring and level of information on most species or species groups is adequate to support a comprehensive strategy to manage bycatch species but it is arguable whether it is sufficient to evaluate with a high degree of certainty whether a strategy is achieving its objective. As with retained byproduct, although the raw information is adequate, more regular, comprehensive and detailed analysis and reporting of the data are required before it can be considered to be able to evaluate with a high degree of certainty whether the strategy is meeting the objective. It is not clear how often ecological risk assessments will be undertaken for the fishery, but if this is not done regularly, then alternative detailed analysis and reporting of the retained species catch (and catch rate) is required on an annual basis. Presently, information provided in the annual report on the fishery is lumped into the major taxonomic groups (fish, sharks, invertebrates) and this cannot be used to effectively monitor the management strategy. Such analysis and information is easily provided (as was done by request for this MSC assessment) but needs to be a formalized process incorporated as part of the annual assessment and reporting of the fishery. It is not clear from the information provided as to how the strategy is implemented during the season, with respect to the detection and notification of the breach of any trigger limit. It is unclear whether the data on cumulative annual catches are analyzed at the end of a trip or at the completion of each shot. Based on the above, element 3 of SG100 is not achieved.

The catch composition of each shot/haul is fully monitored and recorded by either weight and/or number (depending on the species/taxon) and is of sufficient detail to assess ongoing mortalities to all retained species or species groups. Accurate information on the number, sex and estimated weight of Sleeper Sharks is recorded by observers. This achieves element 4 of SG100 justifying an overall score of 85 for both trawl and longline.

### 2.2.3 Trace References

AFMA (2009b); AFMA (2011).

2.3.1		
<p>The fishery meets national and international requirements for protection of ETP species.</p> <p>The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.</p>		
SG 60	SG 80	SG 100
Known effects of the fishery are <u>likely</u> to be within limits of national	The effects of the fishery are known and are <u>highly likely</u> to be within limits of national and international requirements for	There is a <u>high degree of certainty</u> that the effects of the fishery are within limits of national and

and international requirements for protection of ETP species.  Known direct effects are <u>unlikely</u> to create <u>unacceptable impacts</u> to ETP species.	protection of ETP species.  Direct effects are <u>highly unlikely</u> to create <u>unacceptable impacts</u> to ETP species.  Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	international requirements for protection of ETP species.  There is a <u>high degree of confidence</u> that there are <u>no significant detrimental effects (direct and indirect)</u> of the fishery on ETP species.
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2.3.1 Score	Trawl	Longline
	90	100

### 2.3.1 Scoring Rationale:

The ETP species that potentially interact with this fishery include seabirds, dolphins, fur seals, and elephant seals. Although outside the region of CCAMLR, the MITF is managed in accordance with the Conservation Measures adopted by CCAMLR. Fishing operations in the MITF are also fully compliant with the ‘Recovery Plan for Threatened Albatrosses and Giant Petrels’ and ‘Sub-Antarctic Fur Seal and Southern Elephant Seal Recovery Plan’ (AFMA 2010). 100% observer coverage of all trips ensures this compliance. Observers have reported minimal interactions with any ETP species and the effects of the fishery do not have unacceptable impacts. Both the trawl and longline meet all the elements of SG80.

Ecological risk assessments for both the longline and trawl sector have been conducted and have considered interactions with ETP species.

Longlining was introduced into the fishery during 2006/07 and this was the sole method used during 2009/10 and 2010/11. A range of international best practice methods to avoid the capture of seabirds are used in the MITF; adopted from the autolongliners operating in the Heard Is and MacDonald Is fishery. Interactions with marine mammals do not appear to be an issue. The ecological risk management report for this sector of the fishery (AFMA 2011) concluded that there were no protected species at high risk from the effects of fishing by the MITF demersal longline fishery given the suite of management and conservation initiatives that are in place for the fishery. Longline vessels comply with the Threat Abatement Plan for seabirds and exceed international requirements and there is a high degree of confidence that there are no significant detrimental effects from longlines on ETP species. This is confirmed with 100% observer coverage. The longline sub-fishery meets both elements of SG100.

Daley et al. (2008) conducted a Level 2 ERA on the trawl sector and highlighted Wandering Albatross, the Spectacled Porpoise and Hector’s Beaked Whale as ETP species at potentially high risk. 100% observer coverage has not identified any mortality of these species from fishing. Williams et al. (2001) provides good information on bycatch and fishery interactions with ETP species in the early years of the trawl fishery. Of the 263 shots and 344 hauls monitored by observers, contacts between ETPs and fishing gear were noted in 58 shots and 124 hauls. Of the total of 637 interactions, none appeared to result in any injury. No bird was seen to sustain serious injury or die.

There has been one incident where a juvenile male southern elephant seal was found dead in a trawl net. There are differing reports about the decomposition state of this animal when caught (Williams et al. 2001 cw AFMA 2010) and whether it may have been dead when captured, but if it drowned in the net, it represents the only mortality to a seal during the history of the MITF. The only established breeding colony of Sub-Antarctic fur seals in Australian territory is on Macquarie Island and at present, none of the sea- or land-based anthropogenic

activities presents a significant threat to sub-Antarctic or southern elephant seals (DEH 2004a). A residual risk assessment was conducted which took into account management arrangements of the fishery and no protected species were considered to be at high risk from the effects of the demersal trawl sub-fishery (AFMA 2009a, 2009b). Unlike longlines, however, there is no specific national or international standard for effects on the ETP species in the trawl sector of this fishery. The Threat Abatement Plan for seabirds that is applied to longlines does not cover the trawl sector of the fishery and accordingly, the first element of the SG 100 is not met for trawl.

With respect to potential indirect effects on ETP species, Goldsworthy et al. (2001) investigated trophic interactions between toothfish, its fishery, seals and seabirds around Macquarie Island and concluded there was “...little predation on toothfish by seals or seabirds, or prey competition between toothfish and other marine predators” and that there was “...weak trophic linkages between toothfish, its fishery and seabirds and seals around Macquarie Island”

### 2.3.1 Trace References

AFMA (2010a); DEH (2004a); Williams et al. (2001); Goldsworthy et al. (2001)

2.3.2		
<p>The fishery has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> <li>- meet national and international requirements;</li> <li>- ensure the fishery does not pose a risk of serious or irreversible harm to ETP species;</li> <li>- ensure the fishery does not hinder recovery of ETP species; and</li> <li>- minimize mortality of ETP species.</li> </ul>		
SG 60	SG 80	SG 100
<p>There are <u>measures</u> in place that minimize mortality, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.</p> <p>The measures are <u>considered likely</u> to work, based on <u>plausible argument</u> (eg. general experience, theory or comparison with similar fisheries/species).</p>	<p>There is a <u>strategy</u> in place for managing the fishery’s impact on ETP species, including measures to minimize mortality that is designed to be highly likely to achieve national and international requirements for the protection of ETP species.</p> <p>There is an <u>objective basis for confidence</u> that the strategy will work, based on <u>some information</u> directly about the fishery and/or the species involved.</p> <p>There is <u>evidence</u> that the strategy is being implemented successfully.</p>	<p>There is a <u>comprehensive strategy</u> in place for managing the fishery’s impact on ETP species, including measures to minimize mortality that is designed to achieve <u>above</u> national and international requirements for the protection of ETP species.</p> <p>The strategy is mainly based on information directly about the fishery and/or species involved, and a <u>quantitative analysis</u> supports <u>high confidence</u> that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is evidence that the strategy is achieving its objective.</p>

2.3.2 Score	Trawl	Longline
	80	95

### 2.3.2 Scoring Rationale:

There is a strategy in place for managing the fishery's ETP species (AFMA 2010) and it is mainly based on information directly from the fishery. A major part of this strategy is the ban on discarding any bycatch that may attract or encourage foraging of birds or seals around the vessel, but this is augmented with specific bycatch mitigation measures appropriate to the different fishing methods, a 3nm closure to any fishing around Macquarie Island and an extensive MPA. Fishing operations in the MITF are fully compliant (AFMA 2010) with the 'Recovery Plan for Threatened Albatrosses and Giant Petrels' (SEWPaC 2011a) and 'Sub-Antarctic Fur Seal and Southern Elephant Seal Recovery Plan' (DEH 2004b). Any interaction with ETP species must be reported within 24 hours.

There is a comprehensive strategy in place for longlines and the strict guidelines to mitigate seabird capture during the initial trials (AFMA 2010) were above the requirements to meet international standards, meeting the first element of SG100. No seabirds were killed nor were there any interactions with longline gear during the trial. Mitigation measures included: no offal discharge, night setting only, weighted lines that achieved CCAMLR standard sink rates; paired streamer lines; prohibition of the use of plastic packaging bands; minimization of lighting; and, use of moonpools or brickle curtains during hauling. Further, a trigger limit of one death per vessel of any of the following bird species would require the vessel to cease fishing in the MITF for the remainder of the season: wandering albatross, grey-headed albatross, grey petrel or soft plumaged petrel. Interaction rates with other seabirds are limited to 1 bird per 100,000 hooks as stipulated in the Threat Abatement Plan (DEWR 2006). This strategy is based on quantitative analysis and information directly from the fishery. Following the trial, the AFMA Commission decided that these mitigation measures should continue for future operations. One hundred per cent observer coverage provides clear evidence that the strategy is being implemented successfully and achieving its objective; meeting element 3 of SG100.

The Macquarie Island population of wandering albatrosses is the smallest in the world and can be considered Critically Endangered according to IUCN (1996) criteria (SEWPaC 2011b). The number of annual breeding pairs of Wandering Albatross on Macquarie Island in recent years is fewer than 20 (Terauds et al. 2006) and was only four during 2010 (SEWPaC 2011b). The impact of even one death on these breeding pairs would be significant but a quantitative analysis is not available (Williams et al. 2001). While there have been no deaths or interactions from MITF longline fishing, presumably even one death of a wandering albatross from the Macquarie Island population would mean the strategy would not meet its objectives. Although the fishery has world's best practice methods to prevent interactions with wandering albatross, the critically small size of the population means there cannot be high confidence that the strategy will work in this particular case whereas it might for all other seabird species. A partial score of 5 has been removed from element 2 of SG100 as a result.

The trawl component of the MITF has a strategy in place to reduce interactions with ETP species. Similar to the longline fishery, measures include no offal discharge, no discarding of bycatch that birds or seals could forage on; minimization of lighting; and a limit on the number of boats allowed in the area. The three nautical mile closures and the MPAs restricts where trawling is allowed. In meeting CCAMLR requirements, netsonde cables are not allowed. These measures are highly likely to achieve national and international requirements for protection of ETP species and comply with CCAMLR requirements the Sub-Antarctic Fur Seal and Southern Elephant Seal Recovery Plan (element 1 of SG80). Based on information collected from the fishery over a number of years, there is an objective basis for confidence that the strategy is working and meets element 2 of SG80. There is also evidence that the strategy is being implemented successfully through the 100% observer coverage, meeting element 3 of SG80.

The potential for trawling to interact with seabirds is less than for longlines but still exists and although netsonde cables are banned, potential remains for birds to interact with trawl warps (e.g. Wienecke and Robertson,



2002) even though there have been no deaths recorded for the fishery (AFMA, 2010). AFMA observers do specifically monitor for bird warp strikes but there is not a comprehensive strategy for dealing with interactions of trawling with seabirds or seals and the current strategy does not have any limits for interactions with either seals or seabirds. Other trawl fisheries are introducing seabird management plans for each vessel, but there are none in place in the MITF. Although this may be because there has been no trawling in recent years, we recommend that this aspect of the trawl strategy be addressed before any trawling resumes in the fishery. Until it does, the trawl sub-fishery does not meet any elements SG100.

#### **Recommendation:**

Before trawling resumes in the fishery, a bycatch management strategy should be developed that has limits for interactions with seabirds, seals and other ETP species and appropriate management responses.

### **2.3.2 Trace References**

DEH (2004b); DEWR (2006); SEWPaC (2011a); SEWPaC (2011b); Terauds et al. (2006); Wienecke and Robertson (2002); Williams et al. (2001)

### **2.3.3**

Relevant information is collected to support the management of fishery impacts on ETP species, including:

- information for the development of the management strategy;
- information to assess the effectiveness of the management strategy; and
- information to determine the outcome status of ETP species.

<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>
Information is <u>adequate to broadly understand</u> the impact of the fishery on ETP species. Information is adequate to support <u>measures</u> to manage the impacts on ETP species  <u>Information</u> is sufficient to <u>qualitatively</u> estimate the fishery related mortality of ETP species.	Information is <u>sufficient</u> to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a <u>full strategy</u> to manage impacts.  <u>Sufficient data</u> are available to allow fishery related mortality and the impact of fishing to be <u>quantitatively</u> estimated for ETP species.	Information is <u>sufficient to quantitatively</u> estimate outcome status with a high degree of certainty.  Information is adequate to support a <u>comprehensive strategy</u> to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.  <u>Accurate and verifiable information</u> is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.

<b>2.3.3 Score</b>	<b>Trawl</b>	<b>Longline</b>
	<b>95</b>	<b>95</b>

### **2.3.3 Scoring Rationale:**

Based on the 100% observer coverage and the methods of monitoring ETP species interactions, there is abundant, high quality information on the interactions of both fishing methods with ETP species (AFMA 2010a). The information is sufficient to determine the threats of the gears to ETP species (element 1 SG80) and to be used to support a full strategy. It is also sufficient to quantitatively estimate all fishery-related mortality; thereby meeting element 2 of SG80. Inspection of the Observer Manual reveals that observers specifically

monitor for bird strikes with the warps of trawlers which is a known area of mortality for seabirds other than what actually gets caught in the net.

For both methods, information is available to quantitatively assess the magnitude of impacts, mortalities and injuries. Thus gear configuration, environmental conditions, timing, location and other factors that affect ETP interactions and outcomes of those interactions are known. There is also reasonable monitoring of the populations of ETP species for which interactions are likely to occur. Both methods therefore meet element 1 of SG100. Further, this information is adequate to support a comprehensive strategy to manage impacts and evaluate the whether the strategy is meeting its objectives (element 2 of SG100).

There is accurate and verifiable information on the magnitude of all mortality and injuries to ETP species, but until a full assessment of the potential consequences of these on the status ETP populations, particularly any critically endangered sub-populations of seabirds, the fishery does not meet the requirements of element 3 of SG100 and was only awarded a partial score of 5. This score is influenced by the extremely low interaction rate and the lack of mortalities.

### 2.3.3 Trace References

AFMA (2010a)

2.4.1		
The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.		
SG 60	SG 80	SG 100
The fishery is <u>unlikely</u> to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is <u>highly unlikely</u> to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

2.4.1	Trawl	Longline
Score	90	90

### 2.4.1 Scoring Rationale:

The Tasmanian State waters surrounding Macquarie Island out to three nautical miles are classified as a nature reserve and closed to fishing. Outside of State waters, the Macquarie Island Marine Park covers 162,000 km<sup>2</sup> (~ 34%) of the EEZ around the island. The Macquarie Island Bioregional Province encompasses ~477,000 km<sup>2</sup> and the geomorphic units consist of canyons, deep escarpments, knolls, ridges, trenches, slope and abyssal plains. All of these geomorphic units are represented in the MPA. There is a Highly Protected Zone within the MPA which is managed primarily to protect important foraging areas and a variety of benthic habitats from damage by human activities (EA 2001). The Aurora Trough sector of the MITF is the main trawl ground where the majority of the catch is taken and represents <1% of the EEZ (AFMA 2010). The Macquarie Ridge component of the fishery covers a much larger area but there is relatively little fishing that occurs within this area and most of it is too deep for demersal fishing. At the regional or bioregional basis, therefore, the fishery is highly unlikely to cause serious or irreversible harm to habitat structure and function.

The fishery meets all the elements of the SG 60 and SG 80 but does not score SG 100 for this component because further fine scale information is required on the habitats that exist within the area of the fishery. To this end, a Fisheries Research and Development Corporation project ‘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’ has been undertaken, the results of which were due in July 2011. The outputs and implications will be discussed by SARAG and SouthMAC when they become available.

#### 2.4.1 Trace References

AFMA (2010a); EA (2001)

#### 2.4.2

There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.

SG 60	SG 80	SG 100
<p>There are <u>measures</u> in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered <u>likely</u> to work, based on plausible argument (e.g general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a <u>partial strategy</u> in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</p> <p>There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or habitats involved.</p> <p>There is <u>some evidence</u> that the partial strategy is being implemented successfully.</p>	<p>There is a <u>strategy</u> in place for managing the impact of the fishery on habitat types.</p> <p>The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>

2.4.2 Score	Trawl 90	Longline 95
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#### 2.4.2 Scoring Rationale:

State and Commonwealth marine reserves exist around Macquarie Island which are extensive compared to the relatively small footprint of the current area of the fishery, which mainly focuses on approximately 130km<sup>2</sup> of the Aurora Trough region (AFMA 2010d). Less than 1% of the Macquarie Island EEZ is fished (AFMA 2010a). Trawl gear has a minimum bobbin size of 520mm and where rockhopper gear is used, rubber discs of minimum size of 40cm apply (Daley et al. 2008). Through these various mechanisms, there is a strategy in place that manages the impact of the fishery on habitat types at a broad scale and meets element 1 of SG60, SG80 and SG100. Each vessel that fishes in the MITF has 100% observer coverage and is fitted with a Vessel Monitoring System, so any breach of these reserves will therefore be detected; there have been no breaches. As a result, there is clear evidence that the strategy is being implemented successfully and some evidence that it is achieving its objective, thereby meeting element 3 of SG100.

Although most of the area of the Macquarie Ridge is too deep for demersal fishing, in theory there is considerable potential for expansion in the shallower grounds in this part of the fishery. In practice, the conservative TAC for the target species and the ban on targeting other fish species limits the amount of expansion that is likely. Nevertheless, the strategy would be strengthened with explicit statements that govern or control that potential expansion in consideration of information obtained on fine-scale habitat distribution. Generally, there is poor information available on the marine habitat structure on a scale relevant to the fishery and the value of the extensive closures is that they protect vast areas of habitat some of which are likely to occur in the area of the fishery. As such, the strategy can only be considered to have used broad information about the fishery and there has been no testing to support high confidence that the strategy will work. Through its nature of contact on the bottom, trawling has more potential than longlining to have an impact on benthic habitats. The lack of this testing is therefore considered to have a potentially greater consequence for trawl than longline. As a result, the longline sub-fishery received a partial score of five for element 2 of SG100 but trawling did not achieve element 2. This has not been quantified for either method in the MITF.

#### 2.4.2 Trace References

AFMA 2010d; Daley et al. (2008)

#### 2.4.3

Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.

SG 60	SG 80	SG 100
There is a basic understanding of the types and distribution of main habitats in the area of the fishery.  Information is adequate to broadly understand the main impacts of gear use on the main habitats, including spatial extent of interaction.	The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.  Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear.  Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.  Changes in habitat distributions over time are measured. The physical impacts of the gear on the habitat types have been quantified fully.

2.4.3 Score	Trawl 70	Longline 70
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#### 2.4.3 Scoring Rationale:

There is a basic understanding of the main habitat types in the area of the fishery (Commonwealth of Australia 2005) and information is available to broadly understand the main impacts of the gear. Therefore the fishery meets both elements of the SG 60.

The nature of the impacts of both longlines and trawls are well understood and the spatial and temporal footprint of each sub-fishery is well monitored and recorded at fine spatial and temporal scales. This meets the

requirement of element 2 of SG80. Habitats were not assessed as part of the ecological risk assessment for this fishery (Daley et al. 2008). The reviewers could not find documentation of the spatial extent and vulnerability of benthic habitats of the fishery at a scale similar to that of the fishery. As such the actual or potential interaction of the gears with different habitat types is also poorly known and the fishery failed to meet element 1 of SG80.

The lack of information on habitat structure is being addressed by the 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’ but this project had not been finalized at the time of this assessment. This, in addition to the extensive observer coverage which monitors the occurrence of benthic organisms in the catch is considered to meet element 3 of SG80.

**Condition 2.4.3:**

By the first annual surveillance audit, the client shall provide documented evidence that the nature of the impacts of the fishery on different habitat types, at a scale relative to the fishery, is known and that monitoring is continuing to detect any increase in risk to habitat. The client shall include the results of the ongoing study on habitat impacts in the region.

**2.4.3 Trace References**

Commonwealth of Australia (2005); Daley et al. (2008)

<b>2.5.1</b>		
The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>
The fishery is <u>unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is <u>highly unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.

<b>2.5.1</b>	<b>Trawl</b>	<b>Longline</b>
<b>Score</b>	<b>90</b>	<b>90</b>

**2.5.1 Scoring Rationale:**

Ecological risk assessments for both the trawl (AFMA 2009b) and longline (AFMA 2011) components of the MITF have found that given the suite of management and conservation initiatives that are in place, there are no target, bycatch, byproduct or protected species at high risk from the effects of fishing.

A comprehensive study of the trophic interactions between toothfish, its fishery, seals and seabirds around Macquarie Island has been conducted (Goldsworthy et al. 2001). They found that the seal and seabird communities around the Macquarie Island prey primarily on pelagic fish and crustaceans, neither of which form

important prey of toothfish nor are targeted by the fishery. The conclusion of this study was that there was “...little predation on toothfish by seals or seabirds, or prey competition between toothfish and other marine predators”. There was almost no direct overlap between the fishery and prey species consumed by major marine predators. Only weak trophic linkages were found between toothfish, its fishery and seabirds and seals around Macquarie Island”. This work was adequate to determine that the fishery was unlikely to disrupt key elements underlying the ecosystem and meets the requirements of SG80 and partial requirement of SG100. To fully meet the requirements of SG100, the ecosystem study would need to encompass a broader suite of species than just seals and seabirds, although these are obviously a large component of the ecosystem around Macquarie Island.

### 2.5.1 Trace References

AFMA (2009b); AFMA (2011); Goldsworthy et al. (2001)

### 2.5.2

There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.

SG 60	SG 80	SG 100
<p>There are <u>measures</u> in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.</p> <p>The measures are considered likely to work, based on <u>plausible argument</u> (eg, general experience, theory or comparison with similar fisheries/ ecosystems).</p>	<p>There is a <u>partial strategy</u> in place, if necessary, that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The partial strategy is considered likely to work, based on <u>plausible argument</u> (eg, general experience, theory or comparison with similar fisheries/ ecosystems).</p> <p>There is <u>some evidence</u> that the measures comprising the partial strategy are being implemented successfully</p>	<p>There is a <u>strategy</u> that consists of a <u>plan</u>, containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p> <p>The measures are considered likely to work based on <u>prior experience</u>, <u>plausible argument</u> or <u>information</u> directly from the fishery/ecosystems involved.</p> <p>There is <u>evidence</u> that the measures are being implemented successfully.</p>

2.5.2 Score	Trawl 90	Longline 90
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### 2.5.2 Scoring Rationale:

There is a strategy which contains various measures to address most of the major impacts of the fishery on the ecosystem (AFMA 2010). There is no targeting of species other than toothfish and strict bycatch limits are in place for all finfish, sharks and crabs. Fishing operations comply with international standards and the Recovery Plans for threatened Albatrosses and Giant Petrels and Sub-Antarctic seal species (AFMA 2010). Extensive closures to all fishing methods in the Macquarie Island EEZ ensure a high level of representative habitat is

protected, at least at the geomorphic unit level. This strategy is considered likely to work based on plausible argument and through the observer coverage, there is evidence that the measures are being implemented successfully. It therefore meets all elements of the SG80.

The separate bycatch, ETP and habitat strategies are based on well-understood relationships between the key elements of the ecosystem, but not necessarily all components. They have not been compiled into an overarching plan and the fishery does not meet element 1 or 2 of SG100.

The strategy could be improved if more information was available on the impacts of both fishing methods on habitats at a fine spatial scale and if the trawl strategy was strengthened with limits on ETP interactions and the catch of coral, sponges and algae. The Commonwealth MPAs are purported to be comprehensive, adequate and representative of the biodiversity within each bioregion at a broad geographical extent. Nevertheless, the overlap of the footprint of the fishery and the finer scale distribution of habitats and biodiversity needs to be elucidated and may influence any future decision about whether limits on the bycatch of coral, sponge and algae are required.

Despite the potential for improvement as mentioned above, the management measures adopted are considered likely to work based on prior experience and information obtained directly from both fishing methods used in the fishery. There is good evidence that the measures are being implemented successfully through the 100% observer coverage. The fishery meets elements 3 and 4 of SG100

## 2.5.2 Trace References

AFMA (2010a); Goldsworthy et al. (2001)

2.5.3		
There is adequate knowledge of the impacts of the fishery on the ecosystem.		
SG 60	SG 80	SG 100
<p>Information is adequate to <u>identify</u> the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but <u>have not been investigated in detail</u>.</p>	<p>Information is adequate to <u>broadly understand the functions</u> of the key elements of the ecosystem.</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but <u>may not have been investigated in detail</u>.</p> <p>The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are <u>known</u>.</p> <p>Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p>	<p>Main <u>interactions</u> between the fishery and these ecosystem elements can be inferred from existing information, and <u>have been investigated</u>.</p> <p>The impacts of the fishery on target, Bycatch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are <u>understood</u>.</p> <p>Sufficient information is available on the impacts of the fishery on the Components <u>and elements</u> to allow the main consequences for the ecosystem to be inferred.</p> <p>Information is sufficient to support the development of strategies to manage ecosystem impacts.</p>

	Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	
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2.5.3 Score	Trawl 90	Longline 90
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### 2.5.3 Scoring Rationale:

The functional relationships between the fishery and major components and elements of the ecosystem are well understood (Goldsworthy et al. 2001). The key prey, predator and competitor species have been well studied and their diets and roles in the ecosystem have been identified and discussed in relation to the fishery. There is also good knowledge of key species of the ecosystem outside just the Target, Bycatch, Retained and ETP species and Habitats. Through the stock assessment work on target species (Fay, 2011, Fay and Tuck 2011, Fay et al. 2011), risk assessments on bycatch, byproduct and ETP species (eg. Daley et al 2008, AFMA 2009b, 2011, Zhou and Fuller 2011) and trophic studies by Goldsworthy et al (2001), there is generally very good information on the key elements of the Macquarie Island ecosystem and the impacts of the fishery. As a result of these thorough investigations, the impacts of the fishery on Target, Retained, Bycatch, and ETP species are identified and the main functions of these components in the ecosystem are understood. Based on this level of information, both the trawl and longline sub-fisheries meet all SG80 elements as well as elements 1 and 3 of SG100.

Although the stock status of all bycatch and byproduct species has not been quantified, there is sufficient high quality information available on the total catch and interactions of the fishery on the various components of the ecosystem to allow the main consequences for the ecosystem to be inferred. Further work needs to be done on the habitat component at spatial scales similar to that of the fishery before the fishery can be considered to meet elements 2 and 4 of SG100. The fishery is very close to having sufficient information to support the development of strategies to manage ecosystem impacts (element 5 of SG100) but it has not been demonstrated how the fishery is capable of adjusting its management to environmental change or population changes of other ecosystem components. The potentially increasing importance of anthropogenic climate change on the fishery and its ecosystem has not been considered. Based on the above, element 5 of SG100 is not achieved and the fishery is scored 90 for both gear types.

### 2.5.3 Trace References

AFMA (2009b); AFMA (2011); Daley et al. (2008); Fay (2011); Fay and Tuck (2011); Fay et al. (2011); Zhou and Fuller (2011)

## 10.3 MSC Principle 3

**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.**

### 3.1.1

The management system exists within an appropriate and effective legal and/or customary framework which ensures that it:



<ul style="list-style-type: none"> <li>- Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2;</li> <li>- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and</li> <li>- Incorporates an appropriate dispute resolution framework.</li> </ul>		
SG 60	SG 80	SG 100
<p>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.</p> <p>The management system incorporates or is subject by law to a <u>mechanism</u> for the resolution of legal disputes arising within the system.</p> <p>Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.</p> <p>The management system has a mechanism to <u>generally respect</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes which is <u>considered to be effective</u> in dealing with most issues and that is appropriate to the context of the fishery.</p> <p>The management system or fishery is attempting to comply in a timely fashion with binding judicial decisions arising from any legal challenges.</p> <p>The management system has a mechanism to <u>observe</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes that is appropriate to the context of the fishery and has been <u>tested and proven to be effective</u>.</p> <p>The management system or fishery acts proactively to avoid legal disputes or rapidly implements binding judicial decisions arising from legal challenges.</p> <p>The management system has a mechanism to <u>formally commit</u> to the legal rights created explicitly or established by custom on people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>

### **Score: 100**

#### **3.1.1 Scoring Rationale:**

The MI Toothfish Fishery is managed by AFMA. The management system therefore comprises the Australian domestic management regime. However, on a voluntary basis, AFMA applies the CCAMLR's conservation measures and in some respects, AFMA's management system exceeds the CCAMLR requirements. The more rigorous arrangements implemented by AFMA include the requirement to have both an observer and a data collection officer, or two observers, on each vessel compared to CCAMLR's requirement for a single observer and the retention of all offal.

The Toothfish stock fished in the MITF may straddle the Australian and New Zealand EEZs and CCAMLR's Ross Sea Fishery. Currently the management systems associated with these small catches in the New Zealand EEZ and the Ross Sea are not considered as part of the management system for the fishery since they are not considered to compromise the ability of the Australian system to deliver effective management of the stock. As noted in Section 5.2, very small quantities of Patagonian toothfish are taken in these areas. As a member of CCAMLR Australia is well positioned to monitor catches of Patagonian toothfish in the Ross Sea and to initiate action through CCAMLR if required. The United Nations Convention on the Law of the Sea and the United Nations Fish Stocks Agreement, to which Australia and New Zealand are each a Party, require that such

straddling stocks be managed cooperatively. There are currently no cooperative management arrangements in place, and New Zealand catch of the stock is not taken into account in the Australian stock assessment. However, to date the New Zealand catch of Toothfish has been at very low levels, and New Zealand introduced Toothfish into its quota management system in 2010 with a TAC of 50 t. New Zealand has indicated its preparedness to discuss sustainability matters in relation to the stock with the Australian Authorities (Ministry of Fisheries, 2009). Similarly, AFMA (2010a) has indicated that DAFF has initiated correspondence with New Zealand officials on the fishery.

The responsibilities for administration of legislation by AFMA are prescribed in Administrative Arrangements Orders made by Australia's Governor General. The main legislative instrument for management of the fishery is the Macquarie Island Toothfish Fishery Management Plan 2006 (available at <http://www.comlaw.gov.au/Details/F2006L00933>) developed under the FMA. The Plan is a statutory instrument established under the FMA. AFMA implements relevant CCAMLR Conservation measures through the *Fisheries Management (Macquarie Island Fishery) Regulations 2002* or as conditions on the statutory fishing rights (SFRs) allocated to participants in the MI Toothfish Fishery. In addition, the fishery is subject to assessment against the *Guidelines for the Ecologically Sustainable Management of Fisheries* under the EPBC Act. Both Acts require the application of the precautionary approach and the adoption of measures to ensure ecologically sustainable development. The most recent EPBC Act assessment of the MITF, including both the demersal trawl and longline sectors, was very positive and the fishery was exempt from the relevant provisions of the Act for five years, the maximum period available.

The Australian portion of stock is considered to be well managed (see assessment against PI indicators) and measures are in place to manage the New Zealand fishery. Australia and New Zealand have a demonstrated track record in the cooperative management of a straddling stock, namely the orange roughy stock on Cascade Plateau. Australia's bilateral fisheries engagement with New Zealand is lead by DAFF and semi-regular bilateral meetings on a broad range of fisheries issues including collaboration on science and fisheries management arrangements for shared stocks are held between the two countries. In relation to the shared stock around Macquarie Island, the assessors were advised that DAFF and the New Zealand Ministry of Fisheries have started a dialogue and will progress discussions at the next bilateral meeting between Australia and New Zealand. As a result, the assessors are of the view that the current absence of formal cooperative management does not compromise the ability of the management system to ensure the sustainability of the fishery in accordance with Principles 1 and 2. A recommendation to ensure that catches in the New Zealand fishery and in the Ross Sea are monitored and, if they become a significant proportion of the total catch, are included in the stock assessment and taken account of when making projections for TAC setting purposes, has been made under Indicator 1.2.2.

AFMA operates as a Commission which reports to the Commonwealth Minister for Agriculture, Fisheries and Forestry. DAFF provides the overarching fisheries policy context in which AFMA operates. A key component of that is the commonwealth Harvest Strategy Policy (HSP) (DAFF, 2007) which effectively sets a minimum standard for harvest strategies applied to fisheries such as the MITF. The HSP requires that harvest strategies be developed for Commonwealth fisheries, with the exception of those that are managed under an international management body or arrangement. While the MITF is managed in accordance with CCAMLR principles it is not managed under CCAMLR. As a result the assessors are of the view that the HSP requires that a harvest strategy be developed for the MITF in accordance with the requirements of the HSP. AFMA's published list of harvest strategies (<http://www.afma.gov.au/managing-our-fisheries/harvest-strategies/>) does not include a harvest strategy for the MITF. Wilson *et al.* (2010) have concluded that the control rules in place for the MITF are consistent with the HSP. However, the assessment team notes that the HSP requires that domestically managed Commonwealth fisheries be managed to a maximum economic yield ( $B_{MEY}$ ) target and, that where  $B_{MEY}$  is unknown, a proxy of  $1.2B_{MSY}$  be used. To date, the assessment team has seen no explicit reference to

how management of the MITF seeks to achieve  $B_{MEY}$ . For completeness and to demonstrate full consistency with the national harvest strategy standard, the assessors believe that the fishery should formally publish a harvest strategy and identify explicitly how the fishery complies with all aspects of the HSP.

The Australian management system has well established mechanisms for administrative and legal appeals of decisions taken in respect of the fishery. Formal administrative and legal appeal mechanisms are prescribed in the FMA. These mechanisms have been used and tested extensively across AFMA fisheries but their use has not been required in the MITF. Further, AFMA's consultative and partnership approach to management, which is inclusive of all stakeholders, provides informal but effective mechanisms for differences of opinion to be heard and as far as possible, resolved.

The assessors are of the view that the management system of the MITF is generally consistent with both national and international laws and standards and with the achievement of sustainable fisheries as required by MSC principles 1 and 2, element 1 of SG60. The management system for the fishery has established and transparent mechanisms for the resolution of disputes which are generally regarded as effective and have been tested. The fishery therefore meets the first element of SG100. The management system acts proactively to avoid legal disputes and meets the second element of SG100. Customary rights are not an issue in this fishery therefore the final element of SG60, SG80 and SG100 are not relevant. A score of 100 is therefore considered appropriate.

Despite this, the assessors believe that the following two recommendations should be made:

#### **Recommendation for 3.1.1**

- It is recommended that the client actively encourage the responsible Australian agencies to progress bilateral talks with New Zealand so as ensure that the straddling stock of Toothfish continues to be managed appropriately.
- The client should ensure that a harvest strategy for the MITF is clearly identifiable and that it makes explicit reference to how the fishery meets the requirements of the HSP.

#### **3.1.1 Trace References**

AFMA (2010a); DAFF (2007); New Zealand Ministry of Fisheries (2009).

<b>3.1.2</b>		
The management system has effective consultation processes that are open to interested and affected parties.		
The roles and responsibilities of organizations and individuals who are involved in the management process are clear and understood by all relevant parties.		
<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>
Organizations and individuals involved in the management process have been identified. Functions, roles and	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>explicitly defined and well understood</u> for	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>explicitly defined and well understood</u> for <u>all areas of</u>

responsibilities are <u>generally understood</u> .  The management system includes consultation processes that <u>obtain relevant information</u> from the main affected parties, including local knowledge, to inform the management system.	<u>key areas</u> of responsibility and interaction.  The management system includes consultation processes that <u>regularly seek and accept</u> relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.  The consultation process <u>provides opportunity</u> for all interested and affected parties to be involved.	responsibility and interaction.  The management system includes consultation processes that <u>regularly seek and accept</u> relevant information, including local knowledge. The management system demonstrates consideration of the information and <u>explains how it is used or not used</u> .  The consultation process <u>provides opportunity and encouragement</u> for all interested and affected parties to be involved, and <u>facilitates</u> their effective engagement.
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### **Score: 100**

#### **3.1.2 Scoring Rationale:**

Key organizations and bodies involved in the management system are AFMA, SouthMAC, and SARAG. Industry members are also active members of the Coalition of Legal Toothfish Operators (COLTO).

SouthMAC is comprised of representatives from the fishing industry, the conservation community, the research sector, AFMA and AAD and representatives from industry, AAD, CSIRO and AFMA are on SARAG. The functions and roles of the MAC and the RAG are defined in the *Fisheries Management Act 1991* and in AFMA policy documents (AFMA, 2005; AFMA, 2009). The RAG and MAC provide advice to the Commission on management and research for the MITF.

The Australian management system provides regular and extensive opportunities for all stakeholder groups to provide input to the management of the fishery. In addition, the CCAMLR Consultative Forum meets three times each year. For the MITF, this Consultative Forum provides the mechanism through which industry members are advised of changes to CCAMLR measures that may have an impact on management of the MITF. These meetings are formally recorded and records distributed to participants. In addition, ad hoc meetings between industry and AAD and AFMA are held as required and an annual workshop is held for scientists, managers, policy makers, scientific observers and industry participants, including skippers, to provide a forum for informal exchange of information. Outcomes of the annual CCAMLR meeting are discussed with stakeholders and SouthMAC prior to development of advice to AFMA.

Decisions of the AFMA Commission are published regularly through the *AFMA Update* which is distributed to interested stakeholders and available on the AFMA web site. However, minimal information is provided on the issues considered in reaching these decisions. The FMA specifies mandatory public consultation periods for any proposed changes to Management Plans made under the Act. The Management Plan for the MITF is currently being amended to provide for the setting of one TAC rather than separate TACs for the two main fishing grounds. The amendments were released for a public consultation period of four weeks. No comments were received and it is now intended that amended Plan will take effect prior to the commencement of the 2012 fishing season.

Overall, the legislative, administrative and consultation process in place across the management system are very

effective. Functions, roles and responsibilities are explicitly defined and well understood by the participants. There are extensive consultation processes in place with which stakeholders engage. The feedback processes in place are transparent and the management system accepts relevant information and local knowledge and demonstrates how this information is used or not used. Each element of each of SG60, 80 and 100 is therefore considered to be met. The fishery is scored at 100.

### 3.1.2 Trace References

AFMA (2005); AFMA (2009c)

<b>3.1.3</b>		
The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.		
<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>
Long-term objectives to guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>implicit</u> within management policy.	<u>Clear</u> long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>explicit</u> within management policy.	<u>Clear</u> long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>explicit within and required by</u> management policy

### **Score: 100**

#### **3.1.3 Scoring Rationale:**

The MITF Management Plan is a statutory plan developed under the FMA. The Plan specifies the long term objectives for the fishery, consistent with the objective of the FMA, as:

- (a) to manage the fishery efficiently and cost-effectively for the Commonwealth; and
- (b) to ensure that the exploitation of the resources of the fishery and the carrying on of any related activities are conducted in a manner consistent with the principles of ecologically sustainable development and the exercise of the precautionary principle, and in particular, the need to have regard to the impact of fishing activities on non-target species and the long-term sustainability of the marine environment; and
- (c) to maximise economic efficiency in the exploitation of the resources of the fishery; and
- (d) to ensure AFMA's accountability to the fishing industry and to the Australian community in management of the resources of the fishery; and
- (e) to reach Government targets for the recovery of the costs of AFMA in relation to the fishery; and
- (f) to ensure, through proper conservation and management, that the living resources of the AFZ are not endangered by over-exploitation; and

(g) to achieve the best use of the living resources of the AFZ; and

(h) to ensure that conservation and management measures in the fishery implement Australia's obligations under international agreements that deal with fish stocks, and other relevant international agreements.

In addition, the overarching fisheries policy context in which the Plan is implemented is prescribed by the Australian Government (DAFF, 2003). This policy identifies ecologically sustainable development and ecosystem-based fisheries management as its key goals.

The long-term objectives of the management system for the fishery are clear and explicit within, and required by management policy. They are consistent with MSC principles and Criteria and the precautionary approach. The fishery meets the requirement of SG100.

### 3.1.3 Trace References

DAFF (2003).

3.1.4		
The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.		
SG 60	SG 80	SG 100
The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that negative incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and <u>explicitly considers</u> incentives in a <u>regular review</u> of management policy or procedures to ensure that they do not contribute to unsustainable fishing practices.

**Score: 100**

### 3.1.4 Scoring Rationale:

AFMA sets the TAC for the MITF taking into account the advice of SARAG and the MAC. Currently, separate TACs are set for the Aurora Trough and Macquarie Ridge sectors of the fishery. Recent work on stock structure has indicated that the fishery should be managed as a single stock, and subject to a single TAC. The Management Plan is being amended to reflect this and it is anticipated that this change will take effect from the season beginning April 2012.

Only three vessels are allowed in the fishery at any time so capacity and effort are limited. Within this limit operators may use trawl or longline vessels.

Australia allocates the TACs as statutory fishing rights (SFRs), in the form of individual transferable quotas (ITQs) to two fishing companies under the MITF Management Plan. SFRs provide security of access to fishers, promote stewardship of the resource and provide a platform for the maximisation of economic efficiency of fishing operations. ITQs are the Australian Government's preferred fisheries management

mechanism, a policy position that was reviewed and reiterated in 2003 (DAFF, 2003). The cap on the number of vessels, together with the annual TAC and allocation of ITQs provide positive incentives for sustainable fishing of the target stock. As noted above, management of broader ecosystem impacts are applied through the MITF Regulations and/or through conditions placed on SFRs.

Management costs are recovered from operators as required by the Australian Government's Cost Recovery Policy (Department of Finance and Deregulation, 2005). Costs are recovered in line with AFMA's Cost Recovery Impact Statement (CRIS) (AFMA, 2010b). The CRIS was revised in 2010 and the revisions have seen an increased contribution to management costs by industry and a decline in the government contribution. The CRIS specifies that industry contributes 100% of the costs associated with:

- management of domestic commercial fisheries, including MACs;
- data collection and management (data management, logbooks, observers, compliance data collection); and
- licensing, registration and revenue collection.

Industry pays 80% of the costs associated with RAGs and the Government contributes the remainder. Government contributes 100% of the costs associated with defining international treaty standards and developing regulation, policy support and domestic and foreign fisheries compliance and enforcement. Costs associated with research are shared between industry and government depending on the flow of benefits to the industry and the broader community. Government contributes 100% of research commissioned by AFMA that results in significant benefits to the Australian community and to sectors outside the domestic Commonwealth commercial fishing industry.

The Australian Government implemented a government-funded structural adjustment program in 2005, however the MITF was not a beneficiary of the subsidies inherent in that program. The fishing industry in Australia is eligible for a diesel fuel rebate. However rather than being seen as a cost-reducing subsidy to the fishing industry, the rebate can more properly be seen as a rebate on a tax that was imposed on diesel as a means of extracting funds from road users in order to contribute to road maintenance and upgrading (Gooday, 2002).

The MITF Management Plan requires that "AFMA and SouthMAC must, at least once every 5 years, assess the effectiveness of the Plan including the measures taken to achieve the objectives of this Management Plan by reference to the performance criteria mentioned in subsection (1)". Each year SouthMAC conducts a review of progress against each of the performance measures, including economic efficiency, contained in the Management Plan and reports this to the AFMA Commission. The results of this assessment are provided on the AFMA web site.

The management arrangements are reviewed periodically under the provisions of Section 10 of the EPBC Act. ABARES also reports on economic efficiency of the MITF annually in the Fisheries Status Reports (see for example, Patterson *et al.*, 2010). The latest report notes that there is a low level of latency of quota in the MI Toothfish Fishery suggesting that the net economic returns are positive. This annual review of ecological sustainability and economic efficiency constitutes an explicit review of incentives in the management policy.

The fishery provides incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2. The performance of the management system fishery is subject to regular review which ensures that it is not encouraging unsustainable fishing practices. The fishery meets the requirement of SG100.

### **3.1.4 Trace References**

DAFF (2003).

<b>3.2.1</b>		
The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>
<u>Objectives</u> , which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>implicit</u> within the fishery management system.	<u>Short and long term objectives</u> , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>explicit</u> within the fishery management system.	<u>Well defined and measurable short and long term objectives</u> , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>explicit</u> within the fishery management system.

**Score: 90**

### **3.2.1 Scoring Rationale:**

The long-term objectives are specified in the MI Management Plan. These have been described in the discussion of Indicator 3.1.3 above. Short-term objectives for the fishery are not specified as explicitly as the long term objectives however they are clearly identifiable for target, non-target and ETP species.

The objectives for the target stock are reflected in the application of the CCMLR control rule, where next year's catch is the constant catch such that:

- the probability that spawning biomass will fall below 20% of the pre-exploitation level over the 35 year projection period does not exceed 0.1; and
- the median escapement for the Fishery of the spawning biomass shall not be less than 50% over a 35 year projection (Fay and Tuck, 2011).

These objectives are well-defined and measurable.

A precautionary overall bycatch limit of 200t for finfish species (other than Patagonian Toothfish) is in place in the MITF. In addition, there is a 50t limit on the retained catch of any species. This 50 t limit reflects a CCMLR decision taken in 1998 that in new and exploratory fisheries a bycatch limit of 50t should be set for any species for which there is not explicit bycatch limit held under a conservation measure. All bycatch, except shark, jellyfish, sponges crabs and corals, must be retained in the MITF in order to limit possible interactions with marine mammals and seabirds. If the precautionary bycatch limit (overall or species limit) is reached, the fishery will be closed for the remainder of the season, so there is a strong incentive for industry to avoid catching bycatch species.

AFMA aims to minimise the impacts of Commonwealth managed fisheries on all aspects of the marine ecosystem. Key to AFMA's implementation of the ecological component of ecologically sustainable development has been the development and implementation of an ecological risk management (ERM) framework. The framework includes a robust and transparent process to assess, through ecological risk assessment (ERA), analyse and respond to the ecological risks posed by Commonwealth managed



fisheries. An ERA and ERM have been prepared for each of the trawl and longline sectors sector of the MITF (Daley *et al.*, 2007, AFMA, 2009, Zhou and Fuller, 2011, AFMA 2011)

AFMA's ERA report for the demersal trawl sector of the MITF found that that there are no target, bycatch, byproduct or protected species considered to be at high risk from the effects of fishing in the MITF given the suite of management and conservation initiatives that are in place for the fishery (Daley, *et al.*, 2007). The ERM report for the trawl sector of the MITF (AFMA, 2009) notes that while no ETP species were identified as high risk all reasonable steps will continue to be taken to minimise interactions with ETP species which have been identified through the ERA process. The arrangements also apply to other species identified as at medium or low risk. The ERM report does not contain specific objectives with respect to minimising the benthic impact.

The results of the quantitative Sustainable Assessment of Fishing Effects (SAFE) level 3 risk assessment of the longline sector of the fishery show there are no species listed as being a priority for management from the ERA process. However, The SAFE level 3 report recommends that more data be collected for the southern sleeper shark and further analysis be conducted when there are sufficient data. To date there have been no interactions with ETP species in the longline fishery. Any interaction with a ETP species would be considered by SARAG.

The short and long-term objective with respect to ETP species is explicitly defined as to minimise interactions and monitoring in the fishery allows trends in interactions to be monitored. However while objectives in respect of bycatch species are explicit, they are not well defined. There are no stock assessments conducted for any bycatch species and the bycatch limits, while likely to be precautionary, do not trigger a longer term management response. While in the short term the fishery would be closed, it remains unclear what action would be taken in the longer term in response to the trigger, i.e. to avoid the catch level being triggered again or to determine whether the trigger limit is appropriate for the stock.

Overall, the objectives of the fishery can be regarded as being consistent with achieving the outcomes of MSC Principles 1 and 2. However, the score for the MITF against this indicator could be increased through a more explicit enunciation of its short-term objectives and how achievement of those objectives will be monitored over time, particularly in regard to objectives for management of bycatch species and habitats. As a result, the fishery is considered to meet the requirement of SG80 but does not fully meet the requirement of SG100. The fishery is scored at 90.

### 3.2.1 Trace References

AFMA (2009); AFMA (2011); Daley et al. (2007); Fay and Tuck (2011); Zhou and Fuller (2011);

3.2.2		
The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives.		
SG 60	SG 80	SG 100
There are <u>informal</u> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	There are <u>established</u> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	Decision-making processes respond to <u>all issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and

Decision-making processes respond to <u>serious issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take <u>some</u> account of the wider implications of decisions.	Decision-making processes respond to <u>serious and other important issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.  Decision-making processes use the precautionary approach and are based on best available information. <u>Explanations</u> are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	take account of the wider implications of decisions.  Decision-making processes use the precautionary approach and are based on best available information.  <u>Formal reporting</u> to all interested stakeholders describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
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**Score: 100**

### **3.2.2 Scoring Rationale:**

The AFMA Commission receives advice from SouthMAC and SARAG. The advice provided to the Commission and the Commission's decisions must be in accord with AFMA's legislative objectives, which are reflected in the MITF Management Plan. SouthMAC and SARAG's advice is formed taking into account relevant the decisions of CCAMLR. There is an extensive consultation process in place to ensure transparency and feedback mechanisms for stakeholders (see discussion under indicator 3.1.2).

The AFMA advisory and decision making processes are well established and clearly linked to objectives and to the application of the precautionary approach, including the use of the best available information. The AFMA Commission's decisions are made public on a timely basis.

There are established decision-making processes that deliver strategies to achieve fishery-specific objectives. The first element of SG80 is therefore met. The decision-making framework responds in a transparent and timely manner to all issues identified through research, monitoring and consultation. The decision-making processes are well established in all components of the management system. Those processes require the application of the precautionary approach, including the use of the best available information. The decisions making processes incorporate established, formal, reporting mechanisms for dissemination of decisions on management responses to these issues. The fishery meets each scoring element of SG100. A score of 100 is considered appropriate. .

<b>3.2.3</b>		
Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.		
<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>

<p>Monitoring, control and surveillance <u>mechanisms</u> exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.</p> <p>Sanctions to deal with non-compliance exist and there is some evidence that they are applied.</p> <p>Fishers are <u>generally thought</u> to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.</p>	<p>A monitoring, control and surveillance <u>system</u> has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.</p> <p>Sanctions to deal with non-compliance exist, <u>are consistently applied</u> and thought to provide effective deterrence.</p> <p><u>Some evidence exists</u> to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.</p> <p>There is no evidence of systematic non-compliance.</p>	<p>A <u>comprehensive</u> monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.</p> <p>Sanctions to deal with non-compliance exist, are consistently applied and <u>demonstrably</u> provide effective deterrence.</p> <p>There is a <u>high degree of confidence</u> that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.</p>
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**Score: 90**

### 3.2.3 Scoring Rationale:

Compliance in the MITF is conducted in accordance with AFMA's Domestic Compliance and Enforcement Policy. AFMA conducts an annual Compliance Risk Assessment for the MITF. In addition, the Tasmanian Parks and Wildlife Service monitors compliance of operators with the Macquarie Island Marine Nature Reserve within 3nm of the Island.

No domestic compliance risks specific to the Toothfish Fishery have been identified but common fisheries compliance risks including non-reporting from the vessel monitoring system (VMS), compliance with closed seasons and areas and misreporting on logbooks apply to the Fishery.

The monitoring control and surveillance system in place in the Toothfish Fishery comprises:

- an integrated Computerised VMS;
  - both Australian companies operating in the fishery carry two VMS units so as to provide a backup in case of failure of one system
- a requirement to carry two observers on board each vessel for the purposes of ensuring compliance with management arrangements such as closed areas, bycatch limits and collection of data
  - observers may raise any compliance-related issues with the Master of the vessels to ensure operators are aware of and comply with management measures;
  - the assessment team notes that the observer arrangements on Macquarie Island Toothfish Fishery vessels exceeds the CCAMLR requirements, i.e. a single observer, and provide for significantly enhanced monitoring activity; and
  - AFMA's observer programme will be assessed under CCAMLR's new observer accreditation scheme in 2011.
- In-port monitoring of unloads by an AFMA authorised officer to ensure compliance with catch limits

- All unloadings of Australian Toothfish vessels are scrutinised and a ‘port access letter’ confirming that the product has been taken legally and in compliance with CCAMLR conservation measures is provided to the Port State
- completion of the Toothfish Catch Documentation Scheme (CDS) paperwork for unloading and export of all Toothfish product; and
- completion of shot-by-shot daily logbooks and submission of that data to AFMA and AAD.

The industry has an excellent record of participation in the collection and submission of data and information relating to the Toothfish Fishery and the ecosystem in which it operates. The annual Fisheries Assessment Plan formalises the nature and extent of the industry’s participation research in the Fishery. The 2011/12 Plan sets out how monitoring responsibilities (tagging) for the 2011/12 season will be shared between the holders of SFRs for the Fishery and how these responsibilities may be traded among operators. Research is funded through a collaborative approach between industry and research providers. In the past, the MITF fishing industry has contributed to research through the provision of vessel time, an observer program, direct financial contributions and the expertise of the crew.

The FMA provides for penalties and sanctions in the event that fishers do not comply with the management measures in the fishery. There is no evidence of systematic non-compliance in the fishery.

In the past, there has been extensive foreign illegal, unreported and unregulated (IUU) fishing for Toothfish in the Southern Ocean. This activity has, however, generally not been conducted in or around Macquarie Island. Only one IUU incident has been detected in the MITF since the fishery began in 1994 when, in 2005, the fishing vessel *Taruman* was apprehended in the Australian EEZ around Macquarie Island. Compliance activity related to foreign IUU fishing is undertaken by AFMA’s Foreign Compliance Section provides the fisheries focus in the Australian Government border protection arrangements, prosecuting offences and disposing forfeited boats, gear and catches. The capacity exists to reallocate compliance assets should the need arise.

A number of factors mitigate against IUU fishing in the MITF. These include:

- the location of the main fishing grounds close to the Island;
- that there is a permanently manned research station on the Island;
- there is a presence of legal commercial fishing vessels in the MITF throughout the winter;
- an informal agreement between AAD and resupply vessels, which regularly enter the waters around Macquarie Islands to service the research station, and tourist boats that traverse the waters around Macquarie Island en route to the Antarctic Territory, whereby these vessels are asked to:
  - attempt to identify any fishing vessels sighted (including by asking by radio the vessel to provide its name, call sign, Lloyd’s registration number, home port and flag State)
  - confirm with the vessel its position and course and asking what activities they are licensed to undertake;
  - obtain photographs and video footage (if possible) of the vessel, with bow, port side, starboard side and stern viewed and close-ups of any special features (e.g. name, identifying marks etc) to assist in further identification of the vessels) and to report this information to AAD.
- Macquarie Island is always considered when planning Southern Ocean patrols. The Royal New Zealand Air Force has a number of flights to the Ross Sea annually. The flying program is risk based and the Macquarie Island EEZ has been covered as a byproduct of this surveillance. New Zealand are currently trialling their new offshore patrol vessels. Early discussions between Australia and New Zealand about placing officers on each country’s boat and patrolling areas of mutual interest are ongoing. This relationship has the potential to increase surveillance and patrolling activity in the EEZ around Macquarie Island.

- Macquarie Island is a significant distance from areas where IUU fishing activity has been concentrated in the past; and
- the overall level of IUU fishing for Toothfish in the Southern Ocean has declined dramatically over the last decade.

The Tasmanian Government issues permits for tourist vessels visiting Macquarie Island. The inclusion, on those permits, of a requirement for those tourist vessels to report sightings of IUU vessels is also being explored.

In 2010, CCAMLR reported that “Seven vessels had been reported to have engaged in IUU fishing in the Convention Area during 2009/10, and the Secretariat had estimated that they had caught 1 615 tonnes of *Dissostichus* spp. during the 2009/10 season to date, of which 133 tonnes were estimated to be *D. eleginoides* and 1 482 tonnes were estimated to be *D. mawsoni*. All IUU vessels were believed to be using gillnets and all vessels were reported to have fished in Subarea 58.4, particularly in Divisions 58.4.1 and 58.4.2” (CCAMLR, 2010). Division 58.4.1 is immediately south of Macquarie Island but extends well to the west. There is no indication at this point that the Patagonian Toothfish stock fished in the MITF extends into this Division. The available information does not confirm whether this IUU activity took place in areas of the Division close to Macquarie Island. Further, as noted by CCAMLR, only 8% of this IUU catch was estimated to be Patagonian Toothfish.

Overall the MCS strategy for the domestic fleet is considered to be comprehensive and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. Sanctions for non-compliance exist and demonstrably provide effective deterrence. The high level of observer coverage provides a high degree of confidence that fishers comply with the management measures. There is no evidence of systematic noncompliance. While it is not possible to judge whether the available sanctions have been consistently applied in the MITF, there is evidence that AFMA applies the sanctions available to it under the FMA consistently when required and the assessors have no reason to believe that this would not be the case in the MITF. Managers and industry are confident that there is good compliance with the management systems and the industry collaborates with researchers and managers to provide information required for effective management of the fishery.

There are a range of measures in place to monitor IUU fishing, and to date only one incident has been detected. However, the assessors have seen no evidence that these measures have been developed as a coherent strategy or part of a compliance plan to ensure that any IUU fishing activity is detected. The assessment team acknowledges that the nature of compliance planning and activities may preclude such information being made available to them. However, on balance it is considered that, taking into account the potential for IUU fishing for Patagonian Toothfish by foreign vessels, the fishery does not meet the first scoring element of SG100 fully.

Overall, the fishery is scored at 90.

### 3.2.3 Trace References

CCAMLR (2010)

3.2.4		
The fishery has a research plan that addresses the information needs of management.		
SG 60	SG 80	SG 100

<u>Research</u> is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.  Research results are available to interested parties.	A <u>research plan</u> provides the management system with a strategic approach to research and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.  Research results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion.	A <u>comprehensive research plan</u> provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.  Research <u>plan</u> and results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion and are <u>widely and publicly available</u> .
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**Score: 90**

### 3.2.4 Scoring Rationale:

The MITF Management Plan requires that “cost-effective and high quality research is carried out in relation to the fishery in accordance with a 5-year strategic research plan, the results of which are:

- (i) included in the assessment process of the fishery; and
- (ii) published in the assessment reports of the fishery; and
- (iii) taken into consideration in determining the total allowable catch, and other management arrangements, in a fishing year;”

The current strategic research plan is the *Antarctic Fisheries Strategic Research Plan 2010-2014* which was developed and is reviewed annually by SARAG (SARAG, 2011). The Plan provides for research to underpin stock assessment, collection of fishery and biological data and to assess ecological aspects of the fishery. The following projects relevant to the MITF are currently underway and funded under the Strategic Research Plan:

- SARAG stock assessment
- Conventional tagging work to contribute to a better understanding of the spatial stock structure and movement dynamics of toothfish
- Age-specific tag recapture rates to investigate the natural mortality of toothfish
- Development of management strategy evaluation (MSE) model for MITF
- Otolith collection, otolith reading/age analysis
- Collection and analysis of catch and effort data
- Design and evaluation of observer data in terms of their benefit in environment/bycatch assessment of sub-Antarctic fisheries
- AFMA surveillance and operations of COLTO for the purposes of quantifying the level of illegal and non-reported catches of toothfish and ecologically related species
- Bycatch monitoring (ongoing through observers)
- Monitoring of interactions with birds and mammals (ongoing through observer program)

This research is variously funded by the AFMA Research Fund, CSIRO and the AAD. In addition, industry contributes to ageing and tagging research.

Research in the MITF is characterised by formal collaboration between industry and research providers. The details of this collaboration are specified in the annual Fisheries Assessment Plan (AFMA, 2011) required under the MITF Management Plan. A copy of the 2011/12 Fisheries Assessment Plan is available on the

AFMA web site. The Fisheries Assessment Plan aims to ensure that an adequate program of monitoring takes place in the fishery in order to provide reliable stock estimates for target species and to monitor the direct impact on non-target species and the ecosystem. Each SFR holder's contribution to research is allocated in proportion to the number of SFRs they hold at the beginning of each fishing season.

Research results are provided to SARAG and SouthMAC and are available to stakeholders through the various consultative mechanisms described under Indicator 3.1.2.

The assessors were of the view that the research plan is comprehensive and provides a coherent and strategic approach to research across Principle 1 and provides reliable and timely information to achieve objectives consistent with Principle 1. In relation to Principle 3, the assessment team did not identify any research gaps that should be included in the Research Plan. However, in relation to P2, the assessment team considered that, while the Research Plan provided for the collection of reliable and timely information on bycatch species, it did not provide for periodic review of these data or for further analysis of the potential impact of the fishery on main retained and discarded species or for the assessment of the status of these species. As a result the fishery does not meet the first element of SG100 in relation to Principle 2.

The Research Plan is readily available on AFMA's website and research reports are available to stakeholders participating in the SouthMAC and SARAG as well as being available in the AFMA website and through the research providers and/or funders.

Overall, the fishery is scored at 90.

### 3.2.4 Trace References

AFMA (2011); SARAG (2011).

3.2.5		
There is a system for monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
SG 60	SG 80	SG 100
The fishery has in place mechanisms to evaluate <u>some</u> parts of the management system and is subject to <u>occasional internal</u> review.	The fishery has in place mechanisms to evaluate <u>key</u> parts of the management system and is subject to <u>regular internal</u> and <u>occasional external</u> review.	The fishery has in place mechanisms to evaluate <u>all</u> parts of the management system and is subject to <u>regular internal</u> and <u>external</u> review.

**Score: 100**

### 3.2.5 Scoring Rationale:

The MITF Management Plan includes performance criteria against which the Fishery must be assessed and requires that:

- each year, SouthMAC assess the extent to which those performance criteria have been met in that year;
- AFMA include in its annual report for a financial year a statement of the extent to which those performance criteria were met in the year; and

- AFMA and SouthMAC, at least once every 5 years, assess the effectiveness of the Plan including the measures taken to achieve the objectives of this Management Plan by reference to those performance criteria.

In accordance with the requirements of the Management Plan, SouthMAC conducts an annual assessment of the performance of the Fishery against the performance criteria contained in the Plan (AFMA, 2010c). This is provided to the AFMA Commission for consideration. AFMA relies on this assessment to meet the requirement of reporting in its Annual Report on the extent to which the performance criteria are met and the assessment is publicly available on the AFMA web site.

The MITF was implemented in 2006 and an assessment of its effectiveness is due in 2011. The assessors have been advised that this review will occur in 2011.

The performance of the fishery is subject to scrutiny by SouthMAC and SARAG and AFMA. AFMA's performance in managing fisheries, including the Toothfish Fishery, is also reviewed through:

- annual reports by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARS) on the status of AFMA-managed fish stocks, the levels of interaction between fisheries and the ecosystems in which they operate, and the economic performance of the fisheries;
- five-yearly (or more frequently if required) assessments of ecological sustainability by DEWHA;
- periodic audits conducted by the Australian National Audit Office.

In addition, AFMA has conducted specific studies such as ecological risk assessments to identify high risk impacts of demersal trawl for Toothfish. Such an assessment is yet to be conducted for the effects of longline fishing in the MITF.

Overall, there is a wide range of review and monitoring mechanisms in place for this fishery. The assessment team considers that, taken together, these constitute evaluation of all parts of the management system and that fishery is subject to regular internal and external review.

### **3.2.5 Trace References**

AFMA (2010c).



## 11. CERTIFICATION RECOMMENDATIONS AND PERFORMANCE SCORES

The fishery achieved normalized scores well in excess of the requirement of 80 or above on each of the three MSC Principles independently (Principle 1 – 98.1, Principle 2 – 88.3 and 89.3 for trawl and longline respectively, and Principle 3 – 97.0). Although the evaluation team found the fishery in overall compliance (a normalized score of 80 on each MSC Principle), it also found the fishery's performance for Indicator (2.4.3) to be below the established compliance mark (an un-weighted score of 80 for a single indicator). In these specific cases, the MSC requires that the Certification Body set 'Conditions for Continued Certification' that when met bring the level of compliance for the select indicator up to the 80-level score. **Table 3** below shows the overall results of the evaluation for Principle 1, 2 and 3.

**Table 3.** Performance Indicator & Principle Scores

Principle	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Wt (L3)	Weight in Principle	Score Trawl	Score Longline
One	1	Outcome	0.5	1.1.1	Stock status	0.5	0.25	100	100
				1.1.2	Reference points	0.5	0.25	100	100
				1.1.3	Stock rebuilding			NA	NA
		Management	0.5	1.2.1	Harvest strategy	0.25	0.125	100	100
				1.2.2	Harvest control rules & tools	0.25	0.125	90	90
				1.2.3	Information & monitoring	0.25	0.125	90	90
				1.2.4	Assessment of stock status	0.25	0.125	95	95
Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.0667	90	90
				2.1.2	Management	0.333	0.0667	90	90
				2.1.3	Information	0.333	0.0667	85	85
		Bycatch	0.2	2.2.1	Outcome	0.333	0.0667	90	90
				2.2.2	Management	0.333	0.0667	95	95
				2.2.3	Information	0.333	0.0667	85	85
		ETP species	0.2	2.3.1	Outcome	0.333	0.0667	90	100
				2.3.2	Management	0.333	0.0667	80	95
				2.3.3	Information	0.333	0.0667	95	95
		Habitats	0.2	2.4.1	Outcome	0.333	0.0667	90	90
				2.4.2	Management	0.333	0.0667	90	95
				2.4.3	Information	0.333	0.0667	70	70
		Trophic function	0.2	2.5.1	Outcome	0.333	0.0667	90	90
				2.5.2	Management	0.333	0.0667	90	90
				2.5.3	Information	0.333	0.0667	90	90
Three	1	Governance and policy	0.5	3.1.1	Legal & customary framework	0.25	0.125	100	100
				3.1.2	Consultation, roles & responsibilities	0.25	0.125	100	100
				3.1.3	Long term objectives	0.25	0.125	100	100
				3.1.4	Incentives for sustainable fishing	0.25	0.125	100	100
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.2	0.1	90	90
				3.2.2	Decision making processes	0.2	0.1	100	100
				3.2.3	Compliance & enforcement	0.2	0.1	90	90
				3.2.4	Research plan	0.2	0.1	90	90
				3.2.5	Management performance evaluation	0.2	0.1	100	100
					Overall weighted Principle-level scores			Principle Score TrawlLongline	
					Principle 1 - Target species			98.1	98.1
					Principle 2 - Ecosystem			88.3	89.3
					Principle 3 - Management			97.0	97.0

## 12. ACTION PLAN FOR MEETING CONDITIONS

The Client for this fishery assessment and certification has submitted an Action Plan for meeting all conditions and requirements under the MSC program.

### ACTION PLAN FOR MEETING THE CONDITIONS FOR CONTINUED CERTIFICATION

Austral Fisheries and Australian Longline  
DATE: January 2012

<b>Action Plan 2.4.3</b>			
Conditional Requirement	How Meet	By Whom	When Completed
By the first annual surveillance audit, the client shall provide documented evidence that the nature of the impacts of the fishery on different habitat types, at a scale relative to the fishery, is known and that monitoring is continuing to detect any increase in risk to habitat. The client shall include the results of the ongoing study on habitat impacts in the region.	Results of benthic impacts study presented publicly.	AAD	March 2013
	Incorporation of results in risk assessment program and in consideration of evaluation of existing Marine Protected Areas to ensure comprehensive, adequate and representative areas are set aside, and impacts on other regions are mitigated where feasible.	SARAG, SouthMAC, AFMA, AAD	March 2014

Where the fishery is found to have met at least the scoring elements for the Scoring Guidepost of 80 (SG80) but issues that were not directly covered in the default assessment tree remained, the assessment team made recommendations. There was one recommendation in each of the three Principles:

#### **Recommendation for 1.2.2:**

Catches in other fisheries that are likely to be from the same stock should be monitored and, if they become a significant proportion of the total catch, they are not only included in the assessment but also taken account of when making projections for TAC setting purposes.

#### **Recommendation for 2.3.2:**

Before trawling resumes in the fishery, a bycatch management strategy must be developed that has limits for interactions with seabirds, seals and other ETP species and appropriate management responses.

### **Recommendation for 3.1.1**

- It is recommended that the client actively encourage the responsible Australian agencies to progress bilateral talks with New Zealand so as to ensure that the straddling stock of Toothfish continues to be managed appropriately.
- The client should ensure that a harvest strategy for the MITF is clearly identifiable and that it makes explicit reference to how the fishery meets the requirements of the HSP.

Industry members continue to press for more formal arrangements between New Zealand and Australia for toothfish catches in the New Zealand region, which are limited by quotas and effectively managed. There is a standing agenda item for the Management Advisory Committee meetings dealing with these catches to ensure monitoring and consideration of the activities are continually being taken into account, and any substantive change to fishing activities in the region would be reflected in the annual stock assessments and TAC setting processes.

## **13. PEER REVIEW, PUBLIC COMMENT AND OBJECTIONS**

A peer review has been conducted by two peer reviewers. Their comments and the response to the comments by the team can be found in Appendix II. As required by the MSC certification requirements, scientists nominated as peer reviewers for this report are posted on the MSC web site for stakeholder comment. Also, a public comment period was held, as well as a posting period for objections as required by the MSC certification requirements.

## **14. MSC LOGO LICENSING RESPONSIBILITIES**

As the “applicant” for certification of the fishery, Austral Fisheries Ltd Pty. and Australian Longline Ltd Pty. are the only entities that have the right to apply for a license to use the MSC logo for these fisheries. It is also the case that Austral Fisheries Ltd Pty. And Australian Longline Ltd Pty. has the right to approve the use of the logo for other fishery participants at its discretion and by a means that is considered fair and equitable (based on MSC requirements). The MSC as the logo license owner has the sole right and responsibility to review and enforce its requirements with regard to the fair and equitable sharing of access to the fishery certificate. SCS as the certification body does not have any obligations to review, approve, or enforce the MSC requirements in this regard.

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16. APPENDIX I – LOCATION OF THE MACQUARIE ISLAND FISHERY AND ADJACENT JURISDICTIONS

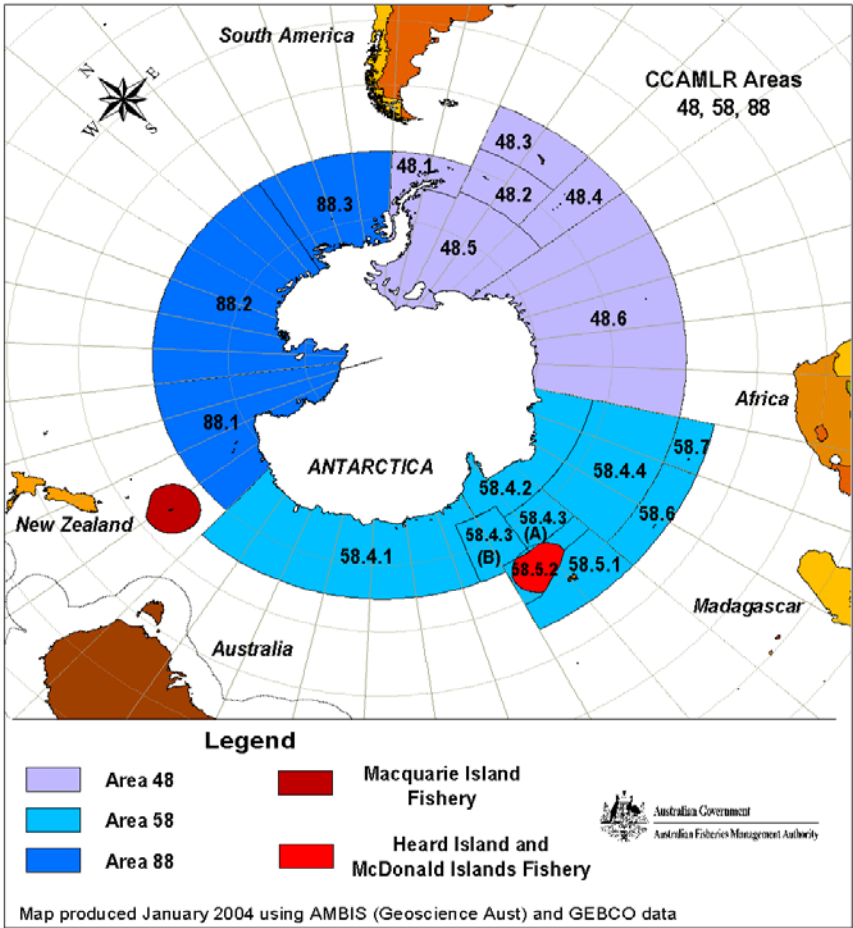


Figure 4. Location of Macquarie Island toothfish fishery and its relation to Australia, New Zealand and CCAMLR areas (from AFMA 2010).





Figure 5. Sketch map showing the main marine jurisdictional zones around Australia and its territories (from Bernadel and Symonds 2001).



Figure 6. Distribution of fishing grounds around Macquarie Island (from Fay and Tuck 2011).

## 17. APPENDIX II – PEER REVIEW COMMENTS

### Peer Reviewers Overall Opinion

Overall Opinion of the Report		
	Peer Reviewer 1	Peer Reviewer 2
<b>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report? (Yes/No)</b>	Yes	Yes
<b>Peer Reviewer Justification</b>	<p>Overall, the team has conducted a full assessment of the fishery by reviewing the best and available information and interviewing the right people. The assessment report presented the evidence which supports their conclusion and scoring of the fishery</p> <p>However, I believe that there are instances where scores and the supporting evidence are inconsistent between PIs. These inconsistencies are highlighted in my comments under specific principles below.</p>	<p>The assessment team's assumptions, analyses of the fishery information provided and scoring appear to be appropriate for the fishery overall and for each gear component. I agree the one condition and one recommendation in the assessment will provide the necessary information to re-evaluate performance indicator 2.4.3 in the future. The minimum performance standards for the three MSC principals have been met and I agree with their recommendations.</p>
<b>Certification Body Response</b>	<b>Second paragraph Peer Reviewer 1 response: please see comments below for each PI response.</b>	
<b>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? (Yes/No)</b>	Yes, I believe that the conditions raised are appropriate and the specified timeframe is adequate to achieve the SG80.	Yes
<b>Peer Reviewer Justification</b>	The systems to support this work are in place and the client has already indicated a willingness to address these conditions.	If the client within the specified timeframe meets the one condition recommended by the assessment team by the next annual surveillance audit, an SG80 score should be achieved for all performance indicators.
<b>Certification Body Response</b>	<b>None required.</b>	

## Client Action Plan Comments

Client Action Plan Comments (if included)		
	Peer Reviewer 1	Peer Reviewer 2
Do you think the client action plan is sufficient to close the conditions raised? (Y/N)	Yes.	Yes
Peer Reviewer Justification	<p>The client is an active Member in the management of the MITF and CCAMLR and will participate and ensure that the information collected is translated into practical actions. It is important however, that as much information to address the condition is collated beyond the ongoing study.</p> <p>In relation to the recommendation, I agree with the Client that a more formal system for collaboration between NZ and Australia is important, as the data is important for the stock assessment of the MITF.</p>	<p>The client's proposed action plan to close the condition on Performance Indicator 2.4.3 relies on the results of the FRDC-partnership project to assess the vulnerability of and risks to habitats from different demersal fishing gears in the Australian EEZ. AAD, AFMA and industry are studying these impacts in the AFZ of Heard Island and the Mac Donald Islands. Presumably, habitats, fishing gears and fishing methods are similar at Macquarie Island and the results of the study can be applied to habitat impacts in the fishery covered under this assessment.</p>
Certification Body Response	None required.	

## Peer Reviewers General Comments

Peer Reviewer General Comments (optional)	
Peer Reviewer 1	Peer Reviewer 2
	The assessment team did a generally outstanding job of scoring the performance indicators and providing logical, scientific support scoring rationale.
Certifying Body Response	
None required.	

## Peer Reviewers Comments Related to Scores and Rationales

### Principle 1

Performance Indicator 1.1.1		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this	Yes, all relevant information has been used to score this	Yes

indicator? (yes/no)	indicator.	
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes, with comment.	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	n/a	N/A
Peer Reviewer Justification	The assessment team clearly presents the information supporting the score, although the ongoing uncertainties in the assessment are noted as well as the means for dealing with some of these.	I agree with the assessment team that there is a high degree of certainty that the stock is above the point where recruitment would be impaired. Fishery harvest in the Macquarie Island fishery is known from the 100% observer program. The assessment team recommendation to monitor harvest from the adjacent straddling areas of the stock in the adjacent New Zealand EEZ and/or within the northern CCAMLR region in the Ross Sea is a good but I didn't find information on whether these fisheries have 100% observer coverage.
Certification Body Response	The recommendation to monitor the harvest from adjacent areas deliberately does not specify how this should occur. Observer coverage may assist in verifying catches and CCAMLR requires 100% coverage as well to fish in the Ross Sea area.	

Performance Indicator 1.1.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	Yes
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	n/a	N/A
Peer Reviewer Justification	The information/arguments in support of the score is presented. The reference although dated is still	I agree that the two reference points for calculation of TAC are conservative and based on

	valid and CCAMLR's use of the reference points is well referenced.	sound methodologies and adequate data and the first and second elements of SG 100 level are met.
<b>Certification Body Response</b>	<b>Not required.</b>	

<b>Performance Indicator 1.1.3</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	n/a	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Na	na
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>	I agree with the information presented and the conclusion that this PI is not applicable to this fishery.	I agree that the performance indicator need not be scored.
<b>Certification Body Response</b>	<b>Not required.</b>	

<b>Performance Indicator 1.2.1</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Again, the information presented (well-referenced) supports the SG 100 for this PI.	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>		The Macquarie Island toothfish fishery is conducted at a low exploitation rate and the 100% observer program provides a strong degree of certainty in the harvest estimates that meet the criteria for SG 100 level scoring.
<b>Certification Body Response</b>	<b>Not required.</b>	

Performance Indicator 1.2.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes.	Yes
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	No	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	See comment above. I think that the recommendation is substantive and wonder if this should be a condition.	N/A
Peer Reviewer Justification	<p>The assessment team presented information supporting the score for this PI, although raising some concerns. In particular, I refer to the text, <i>'The assessment team, however, considered that the evidence does not clearly show that the required levels of exploitation are being achieved because of the uncertainty in some key outputs from the stock assessment, arising from some aspects of the tagging program mentioned under PI 1.1.1 above. These uncertainties mean that exploitation levels actually achieved are not clearly demonstrated'</i>.</p> <p>Despite these points, the PI has been scored as 90. Other concerns about the impact of fishing on the straddling stock are raised and a recommendation is made. On this basis, I am not certain that the scoring of this PI is correct but this also raises issues with PI.1.1.1.</p>	<p>I agree that the SG 100 level has not been met due to some uncertainties from the tagging program and harvests in other areas outside the Australian EEZ. I would also add that magnitude of removals of toothfish from longline gear by marine mammals could change dependent upon changes in marine mammal distribution and could add uncertainty within the stock assessment process that would need to be taken account of during the TAC setting process.</p>
Certification Body Response	<p>The scoring is consistent with the assessment team's view that the available evidence indicates, that tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules and take into account wide range of uncertainties (which is the basis for scoring at 90. However a higher score is not justified since the evidence does <u>not clearly show</u> that (required for a score of 1000.</p> <p>The issue of fishing outside the MI area is a basis for only a recommendation because the available information is that the catches from such fishing are currently very limited, and a small proportion</p>	



	<p>relative to the TAC levels set for the MI fishery.</p> <p>Removals of toothfish from hooks by marine mammals is not currently an issue for this fishery, as evidenced by the observer coverage, and is being closely monitored.</p>
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Performance Indicator 1.2.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	Yes
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	No	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	N/A
Peer Reviewer Justification	The rationale highlights that the second element of the SG100 is met based on the information reviewed. But it also notes that there is a lack of a range of data on some key uncertainties which are important for the harvest strategies and therefore suggest a review of the score to reflect this deficiency more accurately.	I agree there is adequate reliable information available to support the harvest strategy. The recommendation under performance indicator 1.2.1 for monitoring of catches from other areas outside the Australian EEZ should be followed to assure all harvest information is available for inclusion into the harvest strategy process.
Certification Body Response	The assessment team considers that all the information needed by the harvest control rule is available. The remaining uncertainties are not currently an impediment to the implementation of the harvest control rules.	

Performance Indicator 1.2.4		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	Yes
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	Yes
Will the condition(s) raised improve the fishery's	n/a	N/A



<b>performance to the SG80 level? (yes/no/NA)</b>		
<b>Peer Reviewer Justification</b>		I agree reviews by SARAG and CSIRO should be considered internal reviews and are insufficient to meet the externally peer reviewed condition under fourth element of the SG100 scoring criteria.
<b>Certification Body Response</b>	<b>Not required.</b>	

## Principle 2

<b>Performance Indicator 2.1.1</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>		I agree that establishing reference points for all retained species would be a good idea if sufficient data were available.
<b>Certification Body Response</b>	<b>None required.</b>	

<b>Performance Indicator 2.1.2</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>		I agree bycatch is certainly not an issue in the fishery and a strategy is in place to manage

		risk of irreversible harm to the target species or any of the bycatch species.
<b>Certification Body Response</b>	<b>None required.</b>	

<b>Performance Indicator 2.1.3</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	N/A	N/A
<b>Peer Reviewer Justification</b>		It is a little worrisome that there may not be strategies in place for real time assessment of the breach of trigger limits in place in the fishery. With 100% observer coverage it would seem there should be some in-season reporting and at least cursory management review of cumulative harvest by species.
<b>Certification Body Response</b>	<b>Observers and operators are required to monitor catches against the triggers. There is real time data provision, including reporting requirements to indicate when any trigger limit is being approached to mitigate the chance of exceeding those limits. For TEP species, the reporting requirements are within 24 hours of any incident.</b>	

<b>Performance Indicator 2.2.1</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	N/A	N/A
<b>Peer Reviewer Justification</b>		Little is known about the range

		of Southern Sleeper Sharks or their location fidelity. There is the potential for localized depletion due to bycatch. It would be interesting if they could be tagged when caught in the toothfish fishery.
<b>Certification Body Response</b>	This is an interesting suggestion. Sleeper sharks are currently tagged wherever possible in the toothfish fishery. Due to the low catch numbers, however, it is difficult to generate meaningful information. A carefully designed tagging program would need to be implemented to investigate if results could prove useful. Scoring against this performance indicator does not warrant a condition and suggesting a certain study would be outside the scope of this assessment.	

<b>Performance Indicator 2.2.2</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/A	N/A
<b>Peer Reviewer Justification</b>		I agree that the 50 t limit on individual species bycatch is somewhat arbitrary has not been tested as a viable strategy to assure no risk from irreversible harm since little is known about the standing stock biomass of the bycatch species in the Macquarie Island area. What if 59 t of Southern Sleeper Sharks were caught in a season?
<b>Certification Body Response</b>	The sleeper shark limit is 50 t beyond which the fishery is closed. The 50 tonne limit was derived from CCAMLR recommendations, and bycatch levels have never been close to it. Active monitoring of all bycatch species and interactions ensures that measures to minimize any incidental bycatch can be taken rapidly and effectively.	

<b>Performance Indicator 2.2.3</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>

<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>		Ecological risk assessments should be conducted on a fairly regular basis and reviewed if significant changes in target or bycatch species catch rates occur.
<b>Certification Body Response</b>	A full Ecological Risk Assessment to level 3 was performed by CSIRO for this fishery, as well as a SAFE assessment. There is also now a recommendation in the report asking for ETP triggers and management responses to be established before trawling can be resumed.	

<b>Performance Indicator 2.3.1</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>		I agree that based on observer data the fishery appears to have no effect on ETP and the score assigned to both gear types is appropriate. However, I wonder why there is no national standard of effects on ETP species for trawl gear? Trawl gear is common in many other Australian fisheries and national ETP standard would seem to be appropriate.

<b>Certification Body Response</b>	We agree and a recommendation has been added asking for ETP triggers and management responses to be established before trawling can be resumed (see above).
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<b>Performance Indicator 2.3.2</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	N/A	N/A
<b>Peer Reviewer Justification</b>		I agree completely with the scoring of both gear types on this performance indicator. However, even though it appears the fishery has moved to longline gear exclusively, I would have recommended the development of a comprehensive strategy for dealing with interactions with ETP species including limits on interactions before trawling is ever allowed to resume in the fishery.
<b>Certification Body Response</b>	A review of the Observer Manual for the fishery confirms that monitoring for bird strikes on the warps are specifically included. Together with the recommendation for ETP triggers and management response for trawl (mentioned above), the score can now be fully justified.	

<b>Performance Indicator 2.3.3</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes (Longline) No (Trawl)
<b>Will the condition(s) raised improve the fishery's</b>	N/A	N/A

<b>performance to the SG80 level? (yes/no/NA)</b>		
<b>Peer Reviewer Justification</b>		I agree with the score for longline gear but I might have lowered the score 5 points for trawl gear since there is no description of a monitor program for bird interaction with trawl warps. Even though interactions are apparently rare based on observer reports, they may not be monitoring interactions with trawl warps continuously during each set. Possibly a video monitoring program could be implemented if trawl fishing is allowed in the future.
<b>Certification Body Response</b>	Trawl warp interactions are monitored by observers for every shot, both in hauling and in retrieving the gear. Warp lines are also monitored as well during trawling.	

<b>Performance Indicator 2.4.1</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes, the information presented supports the score.	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>		I believe the condition associated with performance indicator 2.4.3 covers any of my concerns with the scoring of this performance indicator.
<b>Certification Body Response</b>	None required.	

<b>Performance Indicator 2.4.2</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or</b>	Yes	Yes

<b>rationale used to score this indicator support the given score? (yes/no)</b>		
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>		I believe the condition associated with performance indicator 2.4.3 covers any of my concerns with the scoring of this performance indicator. I further believe that finer scale habitat impacts of the fisheries need to be determined particularly before any expansion of grounds open for trawling are considered.
<b>Certification Body Response</b>	None required. Work on impacts of fishing gear on the habitat are underway and results will be considered following the final report in the surveillance audit cycle.	

<b>Performance Indicator 2.4.3</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes, with comment	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	Yes	Yes
<b>Peer Reviewer Justification</b>	I believe that the information presented supports the score. In particular, I agree with the condition established for this PI. The client is advised to draw on the report mentioned in PI 2.4.1. This report was due on July 2011. Is this report available now? If not, when? Since the client may be reliant on this report, any delays will presumably mean that the timetable for the client to achieve this condition may be unrealistic. Detailed information	I believe that condition 2.4.3 will provide the information necessary to increase the scoring on this performance indicator to at least the SG80 level. The client's proposed action plan to close the condition on Performance Indicator 2.4.3 relies on the results of the FRDC-partnership project to assess the vulnerability of and risks to habitats from different demersal fishing gears in the Australian EEZ. AAD, AFMA

	on the VMEs and benthic communities will provide a baseline for the client to monitor changes.	and industry are studying these impacts in the AFZ of Heard Island and the Mc Donald Islands. Presumably, habitats, fishing gears and fishing methods are similar at Macquarie Island and the results of the study can be applied to habitat impacts in the fishery covered under this assessment.
<b>Certification Body Response</b>	<b>None required.</b>	

<b>Performance Indicator 2.5.1</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	N/A	N/A
<b>Peer Reviewer Justification</b>		The small magnitude of the fishery effort, target species and bycatch harvest and effects on habitat make it highly unlikely that the ecosystem structure and function would be seriously impacted.
<b>Certification Body Response</b>	<b>None required.</b>	

<b>Performance Indicator 2.5.2</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	N/A	N/A
<b>Peer Reviewer Justification</b>		I agree with the reviewers'



		rationale on scoring this performance indicator. However, I believe that ETP limits should be established for the trawl fishery should that fishery be considered for resumption in the future particularly limits on impacts to coral and sponges.
<b>Certification Body Response</b>	Agreed, a recommendation to establish ETP limits and management responses has been made See comments from response to PIs 2.3.1 and 2.3.2.	

Performance Indicator 2.5.3		
	Peer Reviewer 1	Peer Reviewer 2
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes. See below	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes, with comment	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>	I note the concerns raised about the level of knowledge about the impact of fishery on by-catch species, for example and inferences about the state of these components. In addition, there are concerns about the information (due to be available) resulting on adaptations to the strategies.	I agree with the reviewers that the management strategy needs to incorporate the potential for changes in environmental conditions and populations. Good risk assessment strategies include contingencies for change.
<b>Certification Body Response</b>	None required	

## Principle 3

Performance Indicator 3.1.1		
	Peer Reviewer 1	Peer Reviewer 2
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes, the information provided is sufficient to score the indicator.	Yes
<b>Does the information and/or rationale used to score this indicator support the given</b>	Yes	Yes

score? (yes/no)		
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	n/a	N/A
Peer Reviewer Justification	The information/rationale used to support the score is satisfactory.	I agree with the reviewers scoring on this performance indicator and their two recommendations. I would add a third recommendation that the assessment of stock status be peer reviewed externally.
Certification Body Response	The requirement for peer review of the stock assessment is addressed under indicator 1.2.4. The lack of external peer review has been addressed and appropriately scored under that indicator.	

Performance Indicator 3.1.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	Yes
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	n/a	N/A
Peer Reviewer Justification		I would recommendation that the assessment of stock status be peer reviewed externally.
Certification Body Response	See comments on 3.1.1	

Performance Indicator 3.1.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	Yes
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	n/a	N/A
Peer Reviewer Justification		I agree completely that the long-

		term management objectives of the fishery are clear, explicit and consistent with MSC principals for a sustainable fishery.
<b>Certification Body Response</b>	<b>Not required</b>	

<b>Performance Indicator 3.1.4</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>		I agree with the reviewers that the fishery management system meets SG100 scoring for this performance indicator. Although the fishery is likely to be considered a single stock fishery beginning in April 2012, I would encourage the consideration of separate TACs by fishing area as a means of controlling distribution of fishing effort and minimizing any chance of localized depletion.
<b>Certification Body Response</b>	Currently separate TACs are set for the Aurora Trough and Macquarie Ridge sectors. This split in the TAC was introduced following initial indications from the dynamics of the fishery that the Patagonian toothfish found in the Aurora Trough were a separate component of the population to those found on the Macquarie Ridge. However, based on tagging information that indicates mixing between the Aurora Trough and Macquarie Ridge sectors, SARAG is now of the view that fish found on the Aurora Trough and Macquarie Ridge are likely to be from the same stock and that single TAC is appropriate.	

<b>Performance Indicator 3.2.1</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this</b>	Yes	Yes

<b>indicator? (yes/no)</b>		
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>		I agree with the scoring, but I might have made the suggestion of clarification of the short and long-term management response to bycatch impact triggers potentially being met and explicit enunciation of management objectives for bycatch species and habitats a recommendation similar to the recommendation under performance indicator 3.1.1.
<b>Certification Body Response</b>	The potential for an increased score against this indicator through the explicit enunciation of short-term objectives and how achievement of those objectives will be monitored over time, particularly in regard to objectives for management of bycatch species and habitats, has been identified in the assessment against this indicator. The assessors do not believe that a formal recommendation is required.	

<b>Performance Indicator 3.2.2</b>		
	<b>Peer Reviewer 1</b>	<b>Peer Reviewer 2</b>
<b>Has all the relevant information available been used to score this indicator? (yes/no)</b>	Yes	Yes
<b>Does the information and/or rationale used to score this indicator support the given score? (yes/no)</b>	Yes	Yes
<b>Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)</b>	n/a	N/A
<b>Peer Reviewer Justification</b>		I would recommendation periodic external review of the assessment of stock status.
<b>Certification Body Response</b>	See comments under 3.1.1.	

Performance Indicator 3.2.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	Yes
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes, with clarification.	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	N/A	N/A
Peer Reviewer Justification	Request for clarification. The measures used in relation to the monitoring of IUU fishing should be clarified, as there is also the conclusion that they are not part of a coherent plan. Are these measures part of the MCS system already established by AFMA?	[this performance indicator deals with] New Zealand EEZ and/or within the northern CCAMLR region in the Ross Sea. If trawl fisheries were allowed to resume I would recommend monitoring bird interactions with the trawl warps during towing either via observer monitor or video monitoring.
Certification Body Response	<p>AFMA's MCS measures, as outlined in the text, relate to domestic compliance in the MITF. AFMA's compliance activity with respect to foreign IUU fishing is also based on risk assessments. At present, that activity in the Southern Ocean remains focused on the area around the Antarctic mainland (high seas fishery) inside CCAMLR waters but outside Australian EEZ. For the reasons outlined in the assessment, the likelihood of IUU fishing in the MITF is regarded as quite low and the mechanisms in place for detection of that activity, although not part of cohesive plan, are considered by the assessors to be adequate. However, should those risks increase significantly, either through increased detection, or on the basis of other intelligence available to the AFMA's foreign compliance area, enforcement assets could be reallocated. The text has been amended to distinguish clearly between foreign and domestic compliance activities.</p> <p>With respect to comments on monitoring trawl interactions with seabirds, 100% observer coverage of fishing is required at all times regardless of the method of fishing used. Observers on trawl vessels in the past have monitored seabird interactions and would do so again in the future.</p>	

Performance Indicator 3.2.4		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information	Yes	Yes

available been used to score this indicator? (yes/no)		
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes. In particular, the points discounted collate with the information provided in evaluation of relevant PIs under P2.	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	n/a	N/A
Peer Reviewer Justification		The SARAG stock assessment should be periodically externally reviewed. Little is known about the status of non-target bycatch species in the area that should be a component of research against which the bycatch trigger limits can be assessed.
Certification Body Response	See comments under 3.1.1 re peer review. The scoring of the fishery against this indicator has reflected the gap in the Research Plan in relation to review of data on bycatch species and analysis of the impact of the fishery on these species. The text has been amended to include specific reference to developing an understanding of the status these species. However, it is not considered that any change to the scoring is warranted.	

Performance Indicator 3.2.5		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	Yes
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	n/a	N/A
Peer Reviewer Justification		The SARAG stock assessment should be periodically externally reviewed. Little is known about the status of non-target bycatch species in the area that should be a component of research against which the bycatch trigger limits can be assessed.
Certification Body Response	See comments under 3.2.4.	

Any Other Comments (optional)		
	Peer Reviewer 1	Peer Reviewer 2
		<p>The fishery certainly appears to fully meet the MCS Principals 1, 2 and 3. Several comments are appropriate, however. I am a little concerned about the somewhat arbitrary bycatch limit triggers given the lack of information on the status of these stocks in the Macquarie Island area. While the bycatch triggers meet the requirements established under CCAMLR in 1998 for exploratory fisheries, without better information on the status of stocks in this rather small confined area, it is difficult to assess actual ecological implications of even the small bycatch that is taken in the fishery. Given the large areas closed to fishing and the relative small footprint of the fishery, it is unlikely such impacts are significant but for some unique species such as the Southern Sleeper Shark, localized impacts could be significant. As mentioned above, I would recommend that the SARAG stock assessment should be periodically externally reviewed and I would further recommend that stock assessments from the straddling areas in the New Zealand EEZ and CCAMLR be considered in assessing the overall stock status. IUU fishing, although apparently low and adequately monitored in the Macquarie Island area could potentially be a significant impact on the sustainability of the stock particularly if large scale IUU removals were to occur in the Macquarie Island fishing grounds or the straddling stock areas. It was not clear that there are enforcement capabilities in place locally to interrupt an IUU event. Of a personal interest I noticed no mention of gear loss in the fishery either in the trawl or longline fishery. Derelict fishing gear can have impacts on animals and habitat. Derelict longline gear can entangle and kill marine mammals and impact sessile invertebrates from strumming caused by currents. I was curious how much fishing gear is lost and</p>

		is lost fishing gear ever recovered.
<b>Certification Body Response</b>	<p>See 3.2.3 and 2.2.2. Gear loss reporting requirements: any loss of non-biodegradable material must be reported within 24 hours, and is tabulated and assessed and provided for public information by AFMA and SARAG. Recoveries of any lost fishing gear are also recorded.</p>	



## 18. APPENDIX III: MSC COMMENTS AND TEAM RESPONSES TO PCDR

### MSC

Reference	Grade	Page	Requirement	Scheme requirement	Description
TO.267	Major	49	CR-V1.2-CB3.5.5	The team shall consider species used as bait in a fishery, if they are caught by the fishery under assessment or elsewhere under the Retained Species component in P2.	In this assessment, species used as bait have been considered under the bycatch species component in P2. This should be considered within the retained species component in P2.
Team response: Bait has now been considered under retained instead of bycatch. The scores have not changed					
TO.269	Major	11	CR-V1.2-27.5.8	If events outside the CAB's control mean that team membership must change during an assessment, the CAB shall: 27.5.8.1 Propose new team member(s). 27.5.8.2 Repeat 27.5.7.	A lead auditor who was not part of the assessment team conducted the site visit instead of Sabine Daume, the Team Leader.
Team response: The assessment team of experts for each of the three Principles was not changed. The team leader was involved in all aspects of the assessment process. The only change has been to add an internal CAB staff to the assessment. The trained lead auditor was fully briefed before the onsite meeting and debriefed the team leader afterwards. This person, Adrienne Vincent, did not serve in the capacity of a lead auditor on this project.					
TO.272	Major	26	CR-V1.1-27.12.2.1	If the CAB determines the systems are sufficient, fish and fish products from the fishery may enter into further certified chains of custody and be eligible to carry the MSC ecolabel. The CAB shall determine: The scope of the fishery certificate, including the parties and categories of parties eligible to use the certificate and the point (s) at which chain of custody is needed.	The report is not clear on the points at which Chain of Custody is needed
Team response: Chain of custody starts at the port of landing as detailed in section 7.2 and 7.3.					

TO.271	Major	27	CR-V1.1-27.12.1.5	The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following	It is not mentioned if any transshipment takes place
Team response: Transshipment does not occur in the fishery					
TO.274	Major	28	CR-V1.1-27.6.3	The CAB shall document the rationale for the target eligibility date and include an assessment regarding how the assessed risks to the traceability system in the fishery are adequately addressed by the applicant to give confidence in this date.	The rationale for the target eligibility date is not clearly documented and the risk to the traceability system in the fishery is not mentioned
Team response: The target eligibility date will be the certification date. There is a whole section on potential risks (7.5)					
TO.268	Guidance	38-41	NA		Trace references are incorrectly labeled for some PIs in P1. Please check PI 1.1.3-1.2.2.
Team response: All reference labels have been checked and corrected.					
TO.270	Guidance	27	CR-V1.1-27.12.1.3	The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products. The opportunity of substitution of certified with non-certified fish prior or at landing.	The opportunity of substitution of certified and non-certified fish prior to landing is not clearly defined in the report
Team response: Section 7.5 deals with the potential risk in mixing certified product (fished inside the unit of certification) with uncertified product. Since no transshipment takes place the risk is very low.					

## 19. APPENDIX IV: WWF COMMENTS AND TEAM RESPONSES

### Stock Assessment

WWF: MI fishery targets a stock that is likely to be the same one that NZ also fishes.

Team response: This point is specifically addressed in the report (under 4.5 Migration and movement as it was the recapture off Macquarie Island of a fish tagged in NZ waters that demonstrated the linkage).

WWF: There is a need for an integrated assessment that covers both the Aurora Trough and the Macquarie Ridge. A certified fishery should look to integrate information from across the whole of the exploited population in its stock assessment and management arrangements in setting TACs.

Team response: The latest assessment is such an integrated assessment and the results of this assessment are what we have used in scoring PI indicators. The team included a recommendation encouraging the responsible Australian agencies to progress bilateral talks with New Zealand so as to ensure that the straddling stock of Toothfish continues to be managed appropriately.

### Bycatch

- 1) WWF Australia recommends that a certified fishery include provisions in line with the strict conditions and trigger catch limits for seabird.

Team response:

Longline

Longline vessels comply with the Threat Abatement Plan for seabirds and exceed international requirements. Strict conditions are already in place for longline fishery to the same extent as were applied in the trial. From 2.3.2 “Following the trial, the AFMA Commission decided that these mitigation measures should continue for future operations”.

Trawl

Although trawlers are not currently operating in the fishery they do not have as stringent requirements for TEP species interaction as the longline component of the fishery. We have provided a formal recommendation 2.3.2: “Before trawling resumes in the fishery, a bycatch management strategy should be developed that has limits for interactions with seabirds, seals and other ETP species and appropriate management responses”.

- 2) Consider if the CCAMLR vulnerable marine ecosystem regulations or something similar could not (be) applied within the Macquarie Island fishery.

Team response:

Vulnerable marine ecosystems (VMEs) include areas of cold water corals and sponges, seamount communities, and hydrothermal vent communities CCAMLR established conservation measures to help safeguard VMEs from bottom fishing impacts. These measures require fishing vessels to cease operation if they encounter evidence of a VME, and prevent future fishing in the area until appropriate management actions have been established. They are often applied to the high seas, where there is virtually no habitat protection in place.

Significant benthic habitat management is already established for MITF. State and Commonwealth marine reserves exist around Macquarie Island which are extensive compared to the relatively small footprint of the current area of the fishery; less than 1% of the Macquarie Island EEZ is fished. Information on the fine-scale habitat structure within the area of the fishery is being addressed by a current 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’. The results of this project will highlight if any further management action is required. To ensure this, Condition 2.4.3 of the MSC certification stated “By the first annual surveillance audit, the client shall provide some evidence that the nature of the impacts of the fishery on different habitat types is known and that monitoring is continuing to detect any increase in risk. The client shall consider including the results of the ongoing study on habitat impacts in the region”.

### **Risk assessment for habitat structure and type**

- 3) WWF believes bottom fisheries should have a detailed independent habitat map developed with a recognised ecological risk assessment. WWF understands that the CSIRO will deliver a report of a risk assessment of the effects of demersal longlining this month and this report should be taken into account in the assessment.

#### **Team response:**

Risk assessments have been completed for both methods of the MITF and were used in the assessment. As mentioned above, a habitat mapping project is underway and will be reported shortly.



**MSC Fisheries Assessment: Macquarie Island  
Toothfish Fishery Site Visit Comments  
June 20, 2011**

WWF's Antarctic & Southern Ocean Initiative (ASOI) was established to advocate the protection of the biodiversity of the Antarctic and Southern Ocean through an ecologically representative network of MPAs; sustainable management of legal fisheries and measures to address illegal, unregulated and unreported fishing; the stabilization of populations of Southern Ocean seabirds; and the improved resilience and adaptation ability of the system to the impacts of climate change. The Initiative is hosted by WWF Australia.

A number of WWF national offices directly contribute to the aims and objectives of WWF's ASOI program, including WWF Australia, WWF-New Zealand, WWF South Africa, WWF-UK, WWF-US, WWF Norway, WWF-International and associate Fundacion Vida Silvestre Argentina (FVSA). Other WWF offices engage in advocacy at a national level ahead of key political opportunities and decision-making meetings, such as the annual meetings of the Antarctic Treaty Consultative Parties and the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).

The WWF Network also works for the implementation of ecosystem based management in fisheries via the WWF Smart Fishing Initiative (SFI). Both Patagonian and Antarctic toothfish are priority whitefish species for focused areas of work under the SFI. The WWF Networks engagement in Marine Stewardship Council (MSC) proposed and certified fisheries is coordinated by SFI.

As a contribution to the both the ASOI and SFI programs work on sustainable legal fisheries, WWF is interested in the certification / recertification of any Southern Ocean fisheries, including the South Georgia and South Sandwich Islands Patagonian toothfish longline fishery, South Georgia icefish pelagic trawl fishery, Heard and MacDonald Island mackerel icefish and Patagonian toothfish fisheries, Aker BioMarine Antarctic krill fishery, the Kerguelen & Crozet toothfish fishery and the Ross Sea toothfish longline fishery.

The proposed certification of the Macquarie Island Patagonian toothfish fishery is therefore of interest to WWFs ASOI and SFI programs.

**Proposed Macquarie Island toothfish fishery certification**

The ecosystems of the Southern Ocean are unique with Macquarie Island itself a physically and ecologically unique region of the Southern Ocean. Macquarie Island supports a range of species of fish, marine mammals, seabird and penguins as well as commercially valuable fish populations. Macquarie Island provides critical habitat for four species of albatross species with the grey headed albatross listed as endangered and wandering albatross listed as vulnerable under the Commonwealth EPBC Act.

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The Macquarie Island toothfish fishery appears to be well managed and there is limited capacity in the fishery. In this context, WWF would like to make the following comments.

### **Stock Assessment**

While an annual stock assessment is carried out consistent with procedures used in CCAMLR WWF would like the assessment team to note that the toothfish population fished in the Macquarie Island fishery has been recognised as by Australian and New Zealand authorities as a shared or trans-boundary stock. Also that Patagonian toothfish are taken in the New Zealand exclusive economic zone which adjoins the Macquarie Island Toothfish Fishery. While catches in the New Zealand EEZ have consistently been low, the fishery has entered the New Zealand quota management system with an assigned TAC of 50 tonnes from 1 October 2010.

Further, as yet there is not a complete stock assessment covering the two main fishing grounds of Macquarie Ridge and the Aurora Trough in the Australian fishing zone, however it has been recognised that it is likely that Patagonian toothfish around Macquarie constitutes a single population. A certified fishery should look to integrate information from across the whole of the exploited population in its stock assessment and management arrangements in setting TACs.

### **Risk assessment for habitat structure & type**

In addition to the management measures that focus on the target population as well as the Macquarie Island Commonwealth Marine Reserve that protects a significant portion of the oceanic environment proximate to where the fishery operates, the impact of the fishery on the wider ecosystem must be assessed in the most robust way possible. Due to the fact that both fishing methods historically employed in the fishery have some level of impact on benthic species and assemblages risk assessments for habitat structure and type should be taken into account by the assessment team. WWF believes bottom fisheries should have a detailed independent habitat map

developed with a recognised ecological risk assessment (such as the MSC Risk Based Framework or CSIRO ERAEF). A risk assessment for the demersal trawl fishing was completed in 2009. WWF understands that the CSIRO will deliver a report of a risk assessment of the effects of demersal longlining this month and this report should be taken into account in the assessment.

A further question for assessors to explore is if the CCAMLR vulnerable marine ecosystem regulations or something similar could not be applied within the Macquarie Island fishery.

### **Bycatch**

At present, resident seabird populations on Macquarie Island are under threat from invasive species. While an invasive species eradication program has begun with funding from the Australian Commonwealth and Tasmanian State governments, land based threats to seabird populations remain an issue for seabirds breeding on Macquarie Island.

WWF-Australia would like to recognise the exemplary efforts of fishers during a recent longline trial that resulted in no recorded seabird interactions. WWF-Australia believes that the proactive and enthusiastic engagement of the fishing industry along with managers contributed to this result. This result demonstrates that fishers are able to comply with strict conservation focused measures in regard for the special conservation considerations that should be afforded to Macquarie Islands seabird fauna.

However the conservation status of seabirds that breed on Macquarie Island, specially including the endangered grey headed and wandering albatross, has not changed since a longline trial was begun in 2007. Therefore, given that even the death of a single bird from certain key Macquarie Island breeding populations such as the wandering Albatross could significantly impact the recovery of Macquarie Island breeding populations, WWF-Australia recommends that a certified fishery include provisions in line with the strict conditions and trigger catch limits for seabird

bycatch in the longline trials that began in 2007.

## **Conclusion**

WWF appreciates the opportunity to engage directly on the proposed MSC certification of the Macquarie Island toothfish fishery. Should you have any questions please contact:

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This briefing provides an overview of the issues and major areas of concern to WWF, further information and references are available if required.



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**WWF's mission** is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- conserving the world's biological diversity
- ensuring that the use of renewable natural resources is sustainable
- promoting the reduction of pollution and wasteful consumption.