MACQUARIE ISLAND TOOTHFISH FISHERY
MSC FULL-ASSESSMENT REPORT

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Glossary of Acronyms

AAD	Australian Antarctic Division
ABARES	Australian Bureau of Agricultural and Resource Economics Organisation
AFMA	Australian Fisheries Management Authority
AFZ	Australian Fishing Zone
ASC	Aquaculture Stewardship Council
B_{MSY}	Biomass at maximum sustainable yield
CAB	Conformity Assessment Body
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CDS	Catch Documentation Scheme
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CoC	Chain of Custody
CPUE	Catch Per Unit Effort
CRIS	Cost Recovery Impact Statement
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EEZ	Exclusive Economic Zone
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ETP	Endangered, Threatened or Protected species
ERA	Ecological Risk Assessment
FAO	Food and Agriculture Organization of the United Nations
FAP	Fishery Assessment Plan
FCM	Fisheries Certification Methodology
FMA	Fisheries Management Act 1991
F_{MSY}	Fishing mortality consistent with achieving maximum sustainable yield
HIMI	Heard Island and McDonald Islands
IFQ	Individual Fishing Quota
ITQ	Individual Transferable Quota
IUU	Illegal, Unreported and Unregulated
Kg	kilogram
Lb.	Pound, equivalent to roughly 2.2 kg
LOA	Length Over-All
M	Million (lbs.)
MAC	Management Advisory Committee
MITF	Macquarie Island Toothfish Fishery
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation
nm	nautical mile
NDF	Non Detriment Funding
NGO	Non Government Organisation

NPF	Northern Prawn Fishery
OFL	Over-Fishing Level
PCDR	Public Comment Draft Report
PI	Performance Indicator
PISG	Performance Indicator Scoring Guidepost
PNA	Partner's to the Nauru Agreement
RAG	Resource Assessment Group
RBF	Risk Based Framework
RFMOs	Regional Fisheries Management Organisations
RPOA	Regional Plan of Action
SARAG	Sub-Antarctic Resource Assessment Group
SCS	SCS Global Services
SESSF	Southern and Eastern Scalefish and Shark Fishery
SFR	Statutory Fishing Right
SouthMAC	Southern Management Advisory Committee
SPRFMO	South Pacific Regional Fisheries Management Organisation
SSB	Spawning Stock Biomass
t and mt	metric ton
TAC	Total Allowable Catch
TOB	Total on Board
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UoA	Unit of Assessment
UoC	Unit of Certification
WA	Western Australia
WCPFC	Western and Central Pacific Fisheries Commission
WWF	World Wildlife Fund

1. Executive Summary

SCS Global Services (SCS) is an independent third-party certification body that has undertaken the Marine Stewardship Council (MSC) re-assessment of the Macquarie Island Toothfish Fishery in accordance with the MSC Principles and Criteria for sustainable fishing. This fishery was first certified in May 2012, and this is the 1st re-assessment. The re-assessment complies with the MSC Certification Requirements v1.3 (January 2013) and the guidance to the Certification Requirements v1.3 (January 2013).

The team selected to undertake the re-assessment includes four team members that collectively meet the requirements for MSC assessment teams. These are:

- Dr. Sabine Daume Team Leader, P2 Expert
- Mr. Alexander Morison, P1 Expert
- Dr. Ian Knuckey, P2 Expert
- Ms. Sascha Brand-Gardner, P3 Expert

The team met with fishery representatives, scientists and stakeholders in Hobart, Tasmania on 11-12th August, 2016. Documents were presented by fishery representatives and fisheries scientists. Client representatives were thorough in their approach and provided the assessment team with supporting documents. Where necessary, additional information was requested. The assessment covers two Units of Certification (UoC): Toothfish (*Dissostichus eleginoides*) caught by demersal trawl and demersal longline. The Unit of Assessment (UoA) does not extend to any other fisheries or fishing vessels.

The key strengths of the fishery include that it has already been certified as meeting the MSC Principle and Criteria for a sustainable fishery. The comprehensive compliance and surveillance program ensures a high level of compliance and demonstrates a commitment to combat Illegal, Unreported and Unregulated (IUU) fishing.

In this re-assessment report, we provide the detailed rationales for scores assigned by the audit team for each of the Performance Indicators (PIs) under Principle 1 (Stock Status and Harvest Strategy), Principle 2 (Ecosystem Impact) and Principles 3 (Governance, Policy and Management System) of the MSC Standard. No PIs failed to reach the minimum scoring level of 60, and the average scores for each Principle were above 80 for both UoC (for more details see Section 6.2). These findings support the conclusion reached by the assessment team that all Units of Certification are recommended for recertification according to the MSC Principles and Criteria for Sustainable Fisheries. One PI under Principle 2 scored below 80 and therefore conditions were assigned under PI 2.2.1. for the longline sector. Four recommendations were also made by the team, two for the trawl sector (2.3.2, 2.4.2) if the trawl fishery resumes operation and one for the longline sector (2.4.2). There was an additional recommendation under Principle 3 for both UoCs. The team recommends that objectives for the target stock (i.e. application of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) control rules) should be clearly identifiable within the management system to help explain

that while the fishery is managed by Australia in accordance with CCAMLR principles, it is outside CCAMLR waters, and so is not managed directly under CCAMLR.

2. Authorship and Peer Reviewers

The assessment team included one team leader (Dr. Sabine Daume) and three independent fisheries experts (Mr. Alexander Morison, Dr. Ian Knuckey and Ms. Sascha Brand-Gardner). As outlined below, the assessment team meets the requirements of the MSC Certification Requirements v 1.3 (2013).

2.1 Audit Team

Dr. Sabine Daume, SCS Global Services (SCS), Regional Director Australia and New Zealand

Dr. Daume is the Regional Director for the SCS Sustainable Seafood Program in Australia and New Zealand, which covers Marine Stewardship Council (MSC), Aquaculture Stewardship Council (ASC) and Fisheries Improvement programs. Since 2009, Dr. Daume has led numerous MSC evaluation audits on behalf of SCS, including several large and controversial assessments, and several in Australia. Dr. Daume is a marine biologist with special expertise in the biology and ecology of exploited marine resources with a particular emphasis on invertebrates. Dr. Daume has 20 years' experience working closely with the fishing and aquaculture industry in Australia. She holds a PhD in marine biology from La Trobe University in Victoria, Australia and an MSc in Marine Biology and Marine Chemistry from Kiel University in Germany. Prior to joining SCS, Dr. Daume worked as a Senior Research Scientist at the Research Division of the Department of Fisheries in Western Australia. She has extensive experience working with diverse groups, often in remote marine environments. She has worked with industry personnel at all levels (divers, technicians, managers, executive officers), as well as policy makers and managers in government departments. Dr. Daume led the Western Australia (WA) rock lobster and Heard Island and McDonald Islands (HIMI) icefish annual surveillance and re-assessment, the HIMI toothfish assessment in 2011 and Macquarie Island toothfish assessment in 2011, as well as numerous audits in USA, Canada, Mexico and Japan. Dr. Daume has been trained by the MSC to use the Risk Based Framework (RBF) and the most recent MSC Certification Requirements (v2.0 Oct. 2014). She is a certified lead auditor under the ISO 9001:2008 standard.

Alexander (Sandy) Morison, Morison Aquatic Sciences

Mr. Morison is a consultant specializing in fisheries and aquatic sciences. He has over 30 years' experience in fisheries science and assessment at state, national and international levels and has held senior research positions for state and national organisations in Australia. These include being chair of a range of fishery assessment groups including the Victorian Southern Rock Lobster Assessment Group. Mr. Morison has participated as part of a team undertaking MSC pre-assessments for several fisheries and has been the Principle 1 expert for the MSC certification assessments or surveillance audits of assessments of the Heard Island and McDonald Islands (HIMI) Icefish Fishery, the HIMI Toothfish Fishery, the Macquarie Island Toothfish Fishery, the Kyoto Danish Seine Fishery, the Western Australian Rock Lobster Fishery, the Lakes and Coorong Fishery, the Partner's to the Nauru Agreement (PNA) Purse Seine Skipjack Tuna Fishery, and the expedited Principle 1 assessment of the PNA Purse Seine Yellowfin Tuna Fishery. He was also the Principle 2 expert on the assessment of the Eastern Pacific Ocean Yellowfin and

Skipjack Tuna Purse Seine Fishery. Mr. Morison is also trained as a lead auditor for MSC assessments including the use of the Risk Based Framework and was lead auditor (and Principle 1 and Principle 2 expert) for the assessment of the American Samoan Yellowfin and Skipjack Tuna Fishery. In other recent project work Mr. Morison was engaged by the WA Fisheries Department to review an overview report on the biology and stock status of indicator species in the Gascoyne Coast Bioregion. He has undertaken work for the Australian Department of Environment (and its predecessors) including an assessment of risks posed by fishing methods to the conservation values of proposed marine parks, refinement of the issues paper and recovery plan for freshwater sawfish, and facilitation of an Oceania regional workshop on countries' requirements for Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) listed sharks and rays. Mr. Morison has also worked on an assessment of the ecological risks from Queensland's East Coast Trawl Fishery that looked at the full range of ecological components as well as a separate assessment of this fishery's vulnerability to climate change. He has particular expertise with fish age and growth and has been involved in the development and implementation of harvest strategies for several fisheries. He has over 20 publications in peer-reviewed scientific journals (eight as senior author), eight book chapters, and over 100 project reports, technical reports, client reports and papers in workshop and conference proceedings. The above positions encompass experience with the assessment of invertebrate, chondrichthyan and seven teleost fisheries including commercial and recreational fisheries in freshwater, estuarine and marine habitats and fisheries operating in tropical, temperate and polar environments.

Dr. Ian Knuckey, Fishwell Consulting Pty. Ltd.

Ian is director of Fishwell Consulting, a company providing research and consulting services to encourage and promote sustainable fishing practices. Ian has a PhD in fisheries population dynamics and thirty years of involvement in temperate and tropical fisheries including extensive experience with invertebrate fisheries and both inshore and deep-water 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, Tropical Rock Lobster Resource Assessment Group, 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 and is the principal investigator of a number of programs to design and implement fishery independent surveys and scientific monitoring programs. 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 Southern and Eastern Scalefish and Shark Fishery (SESSF) harvest strategy, the Northern Prawn Fishery (NPF) harvest strategy, the small pelagic fishery and developing harvest strategies for data-poor fisheries. Ian is across the many issues associated with harvest strategies that include economic as well as biological targets and reference points to manage fisheries. Importantly, Ian maintains a good relationship with a range of fishery stakeholders and has done a lot of work directly with the seafood and fishing industry,

particularly helping them better understand and become more involved with the data collection, stock assessment and harvest strategy processes.

Ms. Sascha Brand-Gardner, Department of Fisheries Western Australia

Ms. Brand-Gardner is a fishery manager at the Department of Fisheries in Western Australia. She holds an Honours degree in Marine Zoology from the University of Queensland and has 15 years of experience in fisheries policy, project management and liaison with the fishing and aquaculture industries in Australia. Prior to this, Sascha worked on several marine research projects related to endangered, threatened and protected species, fishery habitats and aquaculture. Sascha was part of the Western Rock Lobster Fishery management team which was the first fishery in the world to gain MSC sustainability certification and has extensive management experience in multi species fisheries including the marine aquarium, coral and specimen shell managed fisheries. Ms Brand-Gardner completed MSC fishery assessment training in Perth and was the Principle 3 expert for the MSC certification assessment of the Australian Blue Grenadier Fishery in 2013. She is currently part of WA's Fisheries Certification Project team that has completed MSC pre-assessments of 50 commercial fisheries and certification of two prawn trawl fisheries and two crab fisheries.

2.2 Peer Reviewers

Indrani Lutchman – Consultant

Indrani Lutchman is a marine biologist and fisheries scientist with 25 years experience of designing, leading and delivering projects relating to marine and fisheries conservation in the Europe, Caribbean, Antarctica, and UK Overseas Territories including Bermuda, Falklands Islands and Gibraltar. She has a long track record of working with stakeholders and policy markers high level negotiations of multi-lateral agreements at the United Nations, Food and Agriculture Organisation of the United Nations (FAO) and Regional Fisheries Management Organisations (RFMOs). She has well-established reputation with international and national Non Government Organisations (NGOs) and fishers and has successfully led multi-national policy research projects and interdisciplinary teams. Her expertise covers diverse aspects of fisheries and maritime policies and includes both desk-based research as well as the provision of strategic and political advice.

Dr. Neil Klaer - Fisheries consultant

Dr. Klaer has worked on fisheries policy advice to the Australian Federal Government and fisheries stock assessment for the past 25 years. He has worked with the Australian Bureau of Rural Sciences to 1993, and CSIRO from 1993 to 2014. He has a BSc majoring in zoology from the University of Queensland and an MSc and PhD in applied ecology from the University of Canberra. Between 1988 and 2004 he provided stock projections to the international Commission for the Conservation of Southern Bluefin Tuna, and managed the scientific team responsible for management strategy evaluation and stock assessment for the Southern Bluefin Tuna fishery. Since 2004 he has assisted with the implementation of a formal harvest strategy framework for the Australian demersal Southern and Eastern Scalefish and Shark Fishery, developed automated systems to facilitate the assessment of more than 30 quota species or groups in the fishery, and provided stock assessments for various quota species mainly using stock

synthesis or data-poor assessment methods. He has developed or assisted in the development of ecosystem models (Ecosim and Atlantis) for the South Eastern Australian shelf region, and the Southern Australian Small Pelagic Fishery. Since 2007 he has undertaken 18 independent reviews of US national fisheries stock assessments for the Center for Independent Experts, reviewed the Inter-Benchmark Protocol for stock assessment of sea bass in the Irish Sea, Celtic Sea, English Channel, and southern North Sea for the International Council for the Exploration of the Sea, participated as an invited expert by the Chilean Government in the development of stock biological reference points for all Chilean national fisheries and provided peer review of MSC certification for the NZ Hoki fishery, PNA Yellowfin fishery, and Unassociated Purse Seine Fishery for Skipjack and Yellowfin Tuna from Western and Central Pacific Ocean. He has 19 peer-reviewed scientific papers (as reported by Scopus, eight as senior author) and more than 100 unpublished reports that have concentrated on seabird bycatch from longline fisheries, multispecies aspects of trawl fisheries, fisheries stock assessment and management strategy evaluation of harvest strategies including those for data-poor fisheries. He has been a private consultant since 2014.

3. Description of the Fishery

3.1 Unit(s) of Certification and scope of certification sought

The Macquarie Island Toothfish fishery (as described in the Unit of Certification in Table 1) is within scope of the MSC certification sought. In compliance with section 27.4 in Part C of CR V1.3 January 2013, SCS confirms that the Macquarie Island Toothfish Fishery conforms to the scope elements defining eligibility for full assessment against the MSC standard. The fishery is not being conducted under a unilateral exemption to an international agreement (CR 27.4.4.1), is not using destructive fishing practices such as fishing with poisons or explosives (CR 27.4.4.2). The fishery does not engage in shark finning, has mechanisms for resolving disputes (CR 27.4.5), and has not previously failed assessment or had a certificate withdrawn (CR 27.4.7). Other eligible fishers have been clearly identified in the Unit of Certification Table below (CR 27.4.8), there are not IPI species (CR 27.4.9), neither stock is enhanced (CR 27.4.12) nor are either P1 species introduced (CR 27.4.14).

The Unit of Assessment includes the Patagonian toothfish (*Dissostichus eleginoides*) stocks caught by currently only 1 vessel that are Statutory Fishing Right (SFR) holders, using demersal trawl or demersal longline, fishing in the vicinity of Macquarie Island, Southern Ocean, within the Australian Exclusive Economic Zone (EEZ).

Table 1: Unit of Assessment (UoA) and Units of Certification (UoC).

	Species	Geographical Area	Method
UoC 1	Patagonian toothfish (*Dissostichus eleginoides*)	Southern Ocean, FAO 81.	Demersal trawl
UoC 2	Patagonian toothfish (*Dissostichus eleginoides*)	Southern Ocean, FAO 81.	Demersal longline
Management system	**Input controls:** limited entry, gear restrictions. **Output controls:** Total Allowable Catch (TAC) on main species and catch limits on bycatch species		
Client	Austral Fisheries Pty Ltd *and* Australian Longline Pty Ltd.		

Units of Assessment: Defined as the species, location and gear assessed	
UoA: Species:	Patagonian toothfish (*Dissostichus eleginoides*)
UoA: Geographical Area	Southern Ocean, FAO 81.
UoA: Gear Type	Demersal trawl and demersal longline
Further information: Stock	Vicinity of Macquarie Island, Southern Ocean, Australian EEZ
Further information: Management System	**Input controls:** limited entry, gear restrictions. **Output controls:** TAC on main species and catch limits on bycatch species
Unit of Certification: Defined as the vessels allowed to use the MSC ecolabel for catch from the Unit of Assessment (defined as the species, location and gear assessed against the MSC standard).	
Client Group	Austral Fisheries Pty Ltd *and* Australian Longline Pty Ltd.
Fishers in the UoC for the chosen stock	Whole fleet. Currently only one vessel: Antarctic Discovery
Other Eligible Fishers that may join the certificate for the chosen stock	No other eligible fishers.

3.2 Overview of the Fishery

The Macquarie Island Toothfish Fishery was first certified in May 2012 and this is the first re-assessment of this fishery. The fishery targets Patagonian toothfish (*Dissostichus eleginoides*) and operates in the vicinity of Macquarie Island in the Southern Ocean, Australian EEZ. 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. One of the main fishing grounds in the region is the Aurora Trough/Macquarie Ridge to the west of the island just outside the State water limit.

The fishing season is year-round for trawl (15 April to 14 April each year), and seasonal (15 April to 31 August) for longline. There is a Total Allowable Catch for toothfish, and catch limits are in place for major bycatch species. It is an Australian Commonwealth fishery managed by the Australian Fisheries Management Authority (AFMA), with advice from the Australian Antarctic Division (AAD) and the Commonwealth Scientific Industry and Research Organisation (CSIRO). Due to its location is managed by measure compatible with the Commission on the Conservation of Antarctic Marine Living Resources.

3.3 Principle One: Target Species Background

3.3.1 Species

Taxonomic classification

Class: Actinopterigii
Order: Perciformes
Family: Nototheniidae
Genus: *Dissostichus*
Species: *eleginoides*

Biology

Distribution and stock structure

The species (*Dissostichus eleginoides*) 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 (Appleyard et al. 2002). It occurs in all waters around Macquarie Island from shallow depths to depths of at least 1 800 m. It also occurs throughout the Campbell Plateau and Tasman Basin to the north of Macquarie Island in New Zealand's EEZ.

Considerable mitochondrial DNA heterogeneity has been found among populations of Patagonian toothfish from three Southern Ocean locations: (i) Macquarie Island, (ii) Heard Island and McDonald Islands (HIMI) and (iii) Shag Rocks/South Georgia suggesting that they are genetically distinct even though there were no significant differences among these populations when comparing seven nuclear microsatellite loci (Appleyard et al. 2002). 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 or between any of these and the HIMI population (Appleyard, 2004). This, combined with results from tagging data which show movement of some fish from Heard Island to Kerguelen and Crozet Islands, suggests that a metapopulation of Patagonian toothfish may exist in the Indian Ocean sector (Williams et al. 2002, 2003: Welsford et al. 2007). The population around Macquarie Island is considered to be distinct and separate to other populations but tagging returns (see below) suggest that the distribution of the stock probably extends into the southern parts of New Zealand's EEZ.

A single TAC is set 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.

Migration and movement

Recaptures of tagged Patagonian toothfish around Macquarie Island have mostly occurred within 10 nautical miles of the tagging site (Williams & Lamb, 1997). Data from a total of over 1900 recaptures produced estimates that between 0.6% and 1.3% of tagged fish had moved from northern to southern

fishing grounds but between 4% and 8% have moved in the other direction (Day et al., 2016). These estimates are outputs from the integrated assessment that combines data on tagging and recapture locations and recapture rates with other fishery data. They are somewhat counterintuitive because, for fish tagged in the north, over 20% of recaptures have been in the south but less than 1% of southern tagged fish have been recaptured in the north. Recapture rates, however, are much lower for the north (4%) than the south (15%). The estimates of movement are described as somewhat uncertain and the explanation offered by Fay (2011) and repeated by Day et al. (2016) is as follows.

"More exploration is needed of the interaction of movement parameters with the other components of the model. The model estimates a high movement rate of fish from south to north in order to reconcile the apparently conflicting results of low recaptures of NV trawl-tagged fish and the recapture of southern tagged fish in the north (i.e. if the stock is large enough for the recapture rate of NV trawl-tagged fish to have been low, then there must be movement from south to north in order for any of the southern tagged fish to have been caught at all in the north)."

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. There is also evidence that Patagonian toothfish found in waters adjacent to Australia's EEZ around Macquarie Island are possibly 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.

Reproduction and Recruitment

The reproductive biology of the Macquarie Island population of Patagonian toothfish has not been studied but information from other populations is believed to be generally applicable. Welsford et al. (2012) have summarised the available information for the species as indicating that the large and yolky eggs of Patagonian toothfish are pelagic, floating up into the top 700 m of the water column after fertilisation, and were mostly encountered over deep (>2200 m) oceanic waters (Evseenko et al., 1995; Kellermann, 1989). Eggs hatch several months after spawning and the pelagic larval phase is thought to be up to 8 months and limited to the upper 200 m of the water column at the early stages while larger larvae tend to be found closer inshore (Evseenko et al., 1995; North, 2002). This long period between spawning and settlement to a demersal juvenile stage provides a long period for potential dispersal of larvae.

Welsford et al. (2012) found toothfish at HIMI increase gonad size and spawn throughout the late autumn/ winter months (May-August), and appeared to concentrate spawning activity in waters 1700-1900 m deep. There are some indications that in South Georgia, Patagonian toothfish release their eggs near the slope at depths of 800–1000 m (Agnew et al., 1999). Welsford et al. (2012) reported that strong biases in sex

ratios of the catch at length were found, with size classes above 100 cm dominated by females. They also reported that a large number of females of all size classes had low gonad weights as a proportion of body weight and low macroscopic stages even during the spawning season suggesting that a substantial proportion of the mature female population did not spawn every year. Everson and Murray (1999) had also reported that there was evidence that a significant proportion of sexually mature fish (25 to 43 %) do not come into spawning condition each year.

The Macquarie Island stock assessment sets the length at 50% maturity at 89 cm (Day et al., 2016). This is larger than estimates for some areas and smaller than for others. A sensitivity test of the effect of setting the length at 50% maturity at 139 cm showed that it had little effect on the assessment (Day et al., 2016). The reported sizes at which 50% of fish become sexually mature varies by region. Males have been found to mature at significantly smaller sizes than females. For HIMI toothfish, females (and both sexes combined) achieve 50% maturity at over 1000 mm (corresponding to ages of 12-17 years), while males mature at around 915 mm (and ages of 11-15 years) (Welsford et al. 2012). Around the Kerguelen Islands, however, the size at which 50% of fish were mature was estimated as being 63 cm for males and 85 cm for females (Lord et al., 2006). At South Georgia, these sizes were 78.5cm +/- 0.5cm total length for male and 98.2 cm +/- 1cm for female fish (Everson & Murray 1999). These sizes correspond to ages of 7-10 years for males and 10-12 years for females (Horn, 2002). Welsford et al. (2012) considered that, although it is possible that there are genuine differences in size-at-maturity between these populations, a more likely explanation for these reported differences, is inter-annual variability in the portion of the population that participate in spawning in any one year.

Growth and Natural Mortality

Patagonian toothfish grow to over 2.2 m long and live to a maximum of at least 51 years of age (Welsford et al., 2015 – WG-FSA 15/55). 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.

As elsewhere, Patagonian toothfish females grow faster and reach larger maximum sizes than males at HIMI (Welsford et al. 2011). The natural mortality of Patagonian toothfish around HIMI has been estimated by Candy et al. (2011) to be 0.155 using catch-at-age and aged mark-recapture data from the main trawl ground.

Growth parameters for the base case Macquarie Island stock assessment were fixed based on sex-specific parameter values estimated from age and length data by Constable et al. (2000). Day et al. (2016) also explored the impact of alternative growth parameters including estimating growth within the assessment model. This is a generally preferred approach if the data are sufficient as it allows for the impacts of length-specific selectivity to be directly accounted for, and in manner that is consistent with respect to the rest of the assessment. These alternatives had minor impacts on the estimates for current spawning stock status.

Diet

Patagonian toothfish 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 Patagonian toothfish 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.

Predators

Patagonian toothfish are not a key low trophic 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. Killer whales (*Orcinus orca*) and sperm whales (*Physeter macrocephalus*) have been observed to remove Patagonian toothfish from commercial fishery long lines around South Georgia Island but there have been no incidences of such whale interactions in the Macquarie Island region.

3.3.2 The Macquarie Island toothfish fishery

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 longline as a fishing method in the fishery.

Catch

Total annual catches have ranged between zero and 987 t but have averaged 362 t over the last five years (Table 2). There are minimal catches of toothfish reported from high seas areas adjacent to the area of the Macquarie Island Toothfish Fishery (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).

Table 3. Catch history for Patagonian toothfish from Macquarie Island (from Day et al. 2016). AT, Aurora Trough; NV, Northern Valleys; NMR, Northern Macquarie Ridge; SMR, Southern Macquarie Ridge.

Fishing season	Trawl		Longline			Total catch (t)	Combined TAC (t)
	AT	NV	AT	NMR	SMR		
94/95	427.3	0.2				427	
95/96	932.9	0.1				933	
96/97	486.3	500.3				987	1750
97/98	188.2	382.8				571	1700
98/99	58.5	40.5				99	640
99/00	9	6.6				16	550
00/01	25.4	0.6				26	460
01/02	0	0				0	282
02/03	36.4	3.3				40	245
03/04	352.8	0.7				353	528
04/05	56.8	0.6				57	208
05/06	264.5	7.9				272	380
06/07	237.3	0.1				237	341
07/08	236.8	0.3	5.4	9	69.2	320	476
08/09	306.1		0	37.1	109.8	453	462
09/10			66.6	8.7	138.2	214	210
10/11			120.2	0	143.6	264	290
11/12			148.2	27.4	181.9	358	510
12/13			167.3	14.5	149.7	332	455
13/14			258.5	13.8	131.3	404	415
14/15			141.2	248	18.7	408	410
15/16			160.8	81.1	67.7	309	460

Stock assessment

Previous assessment approaches for the fishery are described in Day et al. (2016). 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 & 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 most recent assessment (Day et al. 2016) is based on data collected up until and including August 2015 and the following description is taken from the assessment report summary.

The assessment uses a spatial model that fits to data from the entire Macquarie Island toothfish fishery, and assumes a single reproductive stock, but takes into account spatial structuring of the population within the region. Two areas – northern and southern – are incorporated into the model, with movement of fish between areas, and recruitment to both areas. The northern area includes the northern valleys and the Northern Macquarie Ridge; the southern area includes the Aurora Trough and the Southern Macquarie Ridge. A single TAC for the entire Macquarie Island region is calculated using the CCAMLR control rule.

This assessment makes use of the Stock Synthesis assessment software v3.11b (Methot & Wetzel, 2013), and fits to data obtained from the tag-recapture program since 1995, to length composition information for the years 1994–2015, and to age-at-length data obtained from aged otoliths (1997–2015). It is an update of the final version of the 2015 assessment (Day et al., 2015). The assessments are based on a length-age structured model of fish population dynamics, with maximum likelihood and Bayesian methods used to fit to the available data.

The model designates five different fleets (Aurora Trough trawl, Northern Valley Trawl, Aurora Trough longline, and Northern and Southern Macquarie Ridge longlines). Fits to the length composition data are generally good. The fits to the age-at-length data appear to be reasonable, although larger fish are predicted to be older than they are observed to be (the model is growing older fish too slowly). The model fits the tag-recapture data well, with good accord between the total number of expected recaptures and those observed.

Some issues with the tagging data, which is a key input to the stock assessment, that have been identified include the potential for bias due to post-tagging mortality, tag shedding and post-tagging growth retardation (Hillary et al., 2014). The effects of these was explored using a simulation approach which demonstrated that of these, only post-tag mortality and post-tagging growth retardation are probably important factors but that ignoring these is likely to lead to an over-estimation of stock size and the appropriate TAC. Hillary et al. (2014) concluded that a faster-than-expected decline of the Spawning Stock Biomass (SSB) towards the target level that this would produce should nevertheless be picked up in the monitoring and assessment of the fishery with self-correction by the CCAMLR harvest control rule over time. They cautioned, however, that more detailed Management Strategy Evaluation (MSE) work would be needed to fully test the performance of the harvest strategy under these circumstances. Other recent work has explored alternative ways to model the growth of Patagonian

toothfish (Hillary et al. 2016) but these have not yet been incorporated into the stock assessment model.

The base case current female spawning biomass estimate was 67% of unfished at the start of 2016 (and was estimated to be at 69% in 2015) (Figure 1). The trend in spawning biomass from 1990–2015 was almost identical to that estimated last year.

A range of sensitivity analyses were undertaken as part of the assessment (Table 2) and the results were considered in detail in Day et al. (2016). Briefly, the results show that changing the weighting on various data sources degrades the overall fit to the data in all cases, and provides evidence of some conflicts in the signal from different data sources (a common occurrence in integrated assessments) but all these had little effect on the estimate of current stock status.

Table 2. Results of the base case and sensitivity analyses, with estimates of female spawning biomass, and the contributions to the negative logarithm of the likelihood function. The base case has the following parameters fixed: female L_∞ = 165 cm; M = 0.13 yr^{-1} ; h = 0.75; 50% female maturity at 139.6 cm; σ_R = 0.27 and logistic selectivity for the north and south Macquarie Ridge longline fleets. The sensitivity analyses listed here explore the impacts of these assumptions. Likelihood values for sensitivities are shown as differences from the base case. To enable meaningful comparisons to the base case, when the weighting of components is doubled or halved, re-weighted likelihoods are listed in the table, halving or doubling the likelihood on the component that has been changed. A negative value indicates a better fit; a positive value a worse fit. Values in the latter columns in italics indicate values not comparable with those in the base case (from Day et al. 2016)

	Female spawning biomass			F_{50} yield	MSY yield	negative log-likelihood					
Model	$SB_{15/16}$	SB_0	$SB_{15/16}/SB_0$			total	length	age	Tag comp	Tag recap	Recruit
Base case	**2055**	**3083**	**0.67**	**456**	**563**	**2628.5**	**229.5**	**180.5**	**786.4**	**1451.7**	**-19.6**
fix male L_∞ = 130	2678	3826	0.70	441	577	*7.1*	*-7.6*	*-0.7*	*5.1*	*10.0*	*0.2*
fix male L_∞ = 165	2456	3567	0.69	443	572	*3.8*	*-5.4*	*-1.3*	*3.3*	*7.1*	*0.1*
fix male L_∞ = 200	2333	3420	0.68	445	568	*2.4*	*-4.0*	*-1.4*	*2.3*	*5.3*	*0.1*
female L_∞ = 195	2702	4072	0.66	437	547	-1.1	0.7	-1.9	-0.2	0.3	-0.1
$M = 0.155$	1045	1757	0.59	362	460	-14.4	-2.5	-1.7	-6.7	-2.8	-0.7
M estimated (0.20)	430	806	0.53	306	408	*-29.0*	*-1.5*	*-2.1*	*-6.0*	*-18.2*	*-1.2*
$h = 0.5$	2080	3130	0.66	332	361	0.5	0.1	0.0	0.2	0.0	0.2
$h = 0.9$	2047	3067	0.67	505	696	-0.2	-0.1	0.0	-0.1	0.0	-0.1
dome shaped selectivity for NMR & SMR II	2529	3593	0.70	439	564	*-5.5*	*-5.5*	*0.0*	*1.1*	*-1.3*	*0.2*
50% female maturity at 130 cm	2686	3967	0.68	475	578	0.0	0.0	0.0	0.0	0.0	0.0
Halve weight on LF data	2073	3118	0.66	466	574	2.4	8.7	-1.4	-0.5	-0.2	-4.1
Double weight on LF data	2409	3455	0.70	433	560	7.9	-14.4	1.8	5.6	7.7	7.2
Halve weight on age data	2019	3021	0.67	456	563	1.1	-1.7	3.5	0.3	-1.8	0.9
Double weight on age data	2144	3205	0.67	448	559	1.1	1.1	-2.5	-0.2	4.2	-1.5
Halve weight on tag data	2317	3410	0.68	429	552	4.9	-6.3	-2.7	3.3	11.9	-1.2
Double weight on tag data	2037	3038	0.67	470	579	1.7	1.2	2.2	0.6	-4.7	2.4

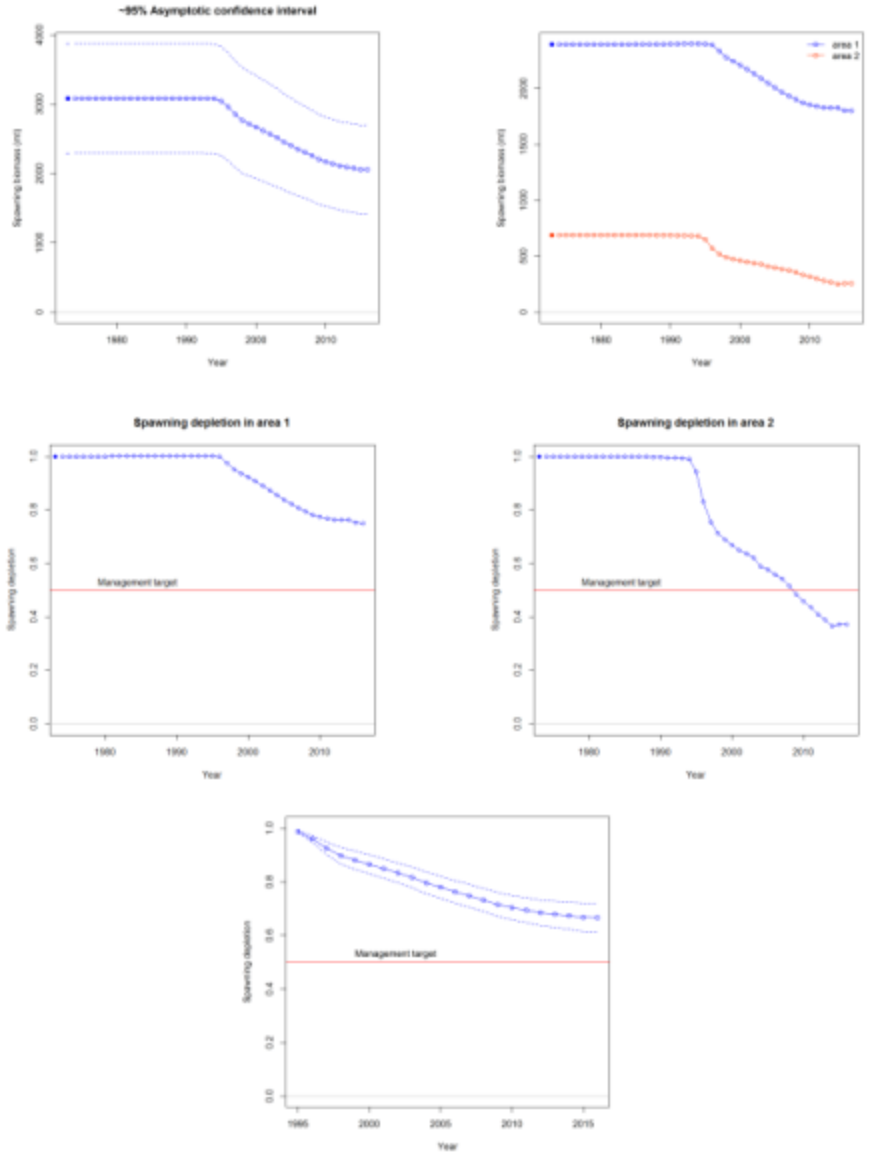

Figure 1. Base case estimated time series for female spawning biomass and spawning depletion (spawning biomass relative to unfished), both by area and overall. Area 1 is north, and area 2 is south (from Day et al. 2016).

Harvest strategy

The elements of a harvest strategy, as defined by the MSC, are monitoring, stock assessment, harvest control rules and management actions, which may include an explicit or implicit management procedure and be tested by Management Strategy Evaluation (CR 1.3).

The harvest strategy for the fishery follows the same approach adopted by CCAMLR for Patagonian toothfish populations elsewhere. The monitoring in place is described below in the section on Information. The stock assessment is described above and includes estimates of the current biomass and projections to estimate catch levels that would comply with the harvest control rules.

These rules used the maximum constant catch applied over a 35 year projection period that satisfied both the following criteria:

- the probability that female 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 female spawning biomass shall not be less than 50% over a 35 year projection.

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

Catches that satisfy these rules are obtained from stochastic projections that were conducted by sampling from the posterior distributions of relevant parameters. The stochastic projections therefore incorporated both parameter uncertainty and uncertainty in future recruitment events, in the calculation of the 2015/16 catch, given implementation of the CCAMLR control rule.

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 adapted to be appropriate for Patagonian toothfish as a large predator that is unlikely to constitute much of the diet of whales, 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.

The performance of the harvest strategy has been evaluated using a MSE approach (Tuck, 2009; Fay and Tuck 2011). The more recent MSE work assessed the performance of the harvest strategy against six performance measures:

1. The median (over simulations) spawning stock status at the end of the projection period (final spawning biomass as a fraction of unfished spawning biomass, (B_0).
2. The probability of the spawning biomass being below the limit reference point of 20% unfished levels (B_{20}) at the end of the projection period.
3. The probability of the spawning biomass going below the limit reference point (B_{20}) at some point during the projection period.
4. The total catch over the projection period.
5. The variability of the annual catches during the projection period.
6. The number of years for which the TAC is less than some threshold value which would likely result in non-profitable fishing operations.

Performance measures 1-3 relate to the effect of implementing the harvest strategy on spawning biomass, and relate to the management objectives. Measures 4-6 provide information regarding the catch performance of the strategy. These measures do not seem to explicitly examine whether the harvest strategy addresses short term objectives, such as avoiding overfishing (e.g. never allowing

fishing mortality to exceed that which is consistent with the maximum sustainable yield (F_{MSY})). Nevertheless, it would be reasonable to expect that if the projections made for 35 years do not breach reference points, then any breaches that might occur within shorter time frames must be of short duration and inconsequential in the longer term.

As noted above, however, recent MSE work by Hillary et al. (2014) has concluded that more detailed MSE work is needed to fully test the ability of the harvest strategy to adequately respond to bias in the stock assessment that would result from post-tagging mortality and growth retardation.

As well as accounting for uncertainty through the probabilistic approach to making projections, precaution is built in to this harvest strategy 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 (DAFF, 2007). 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 two years 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.

Catch levels that satisfied the CCAMLR control rule were calculated under ten alternative assumptions regarding how the catches would be allocated to fleet and region. The projected 2016/17 and 2017/18 catches from these scenarios ranges from 420 t to 500 t. An example of such a projection is provided for a catch of 450 t (Figure 2).

Results of the stock assessment are reviewed by the Sub-Antarctic Resource Assessment Group (SARAG) for comment and its advice is forwarded to AFMA. The AFMA Commission sets TAC levels after taking into consideration the advice from SARAG, SouthMAC (the Southern Management Advisory Committee) and other stakeholders. A single TAC is now set for the whole stock.

Stock status is also reviewed annually by the Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES) who publishes annual Stock Status Reports. The most recent assessment designated the Macquarie Island stock of Patagonian toothfish to be not overfished and not subject to overfishing (Patterson & Skirtun, 2015). The performance is also reviewed by the Australian Department of Environment and Energy whose assessment of the fishery's compliance with the provision of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is required before an approval to export product is granted. Approval requires the species to be listed on the list of exempt native specimens. The MITF has export approval until October 2026.

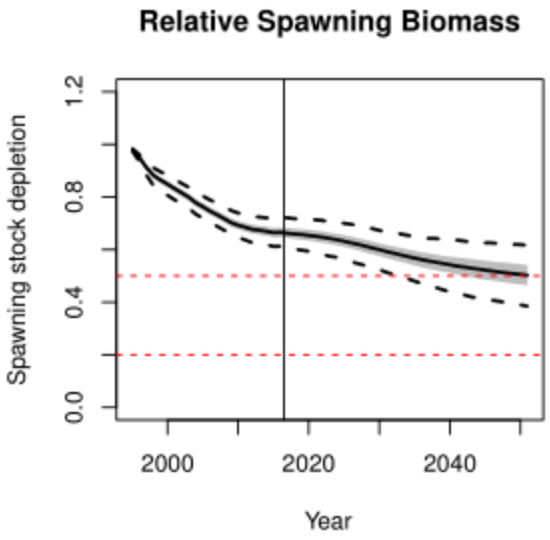

Figure 2. Posterior distribution and projection of female spawning biomass relative to the unfished level, under a constant catch of 450t, split 250t for Aurora Trough, 120t for northern Macquarie Ridge and 80t for southern Macquarie Ridge (from Day et al., 2016).

Information

The information collected on the fishery includes data on all retained catches, a tagging program, size and age composition of the catch, and observer data on all non-target catches (Table 3). There are two observers on all vessels at all times whose responsibilities include data collection monitoring compliance with all conditions concerning target species, bycatch, protected species and any international agreements.

A research plan is in place for the fishery which provides for research into stock assessment, collection of fishery and biological data as well as providing an ecological and economic assessment of the fishery.

Table 3. Fishery-dependent information collection systems in place in the Macquarie Island Toothfish Fishery (from AFMA, 2010).

Description	Information collected	Required by	Collection frequency	Provided to
CCAMLR data forms	1. Fishing gear description 2. Shot by shot information on: - fishing effort; and - catch estimates of target and bycatch species	AFMA (as conditions on SFRs)	1. Every cruise 2. Every fishing operation	AAD and CSIRO For stock assessment purposes and bycatch monitoring
Integrated Computerised Vessel Monitoring System	1. Vessel position, 2. Prior reporting requirements	AFMA (as conditions on SFRs)	1. Continuous 2. Notification of entry and exit from: - the Fishery; and - port	Not released – data is used for AFMA compliance purposes
At sea independent monitoring provided by AFMA authorised and accredited observers	Shot by shot monitoring of: Catch and effort information Biological data on target species including: - tagged and recaptured fish - sexed length/weight frequencies, - otoliths and other biological samples Bycatch interactions with marine mammals and seabirds Data to confirm conversion ratios of processed fish	AFMA (under the Management Plan and regulations)	Every cruise The objective of the program is: 1. 70% observer coverage of trawl shots in the Fishery 2. 60% observer coverage of longline sets and 50% of hauls in the Fishery	- Detailed data and samples provided to AAD for stock assessment purposes - Bycatch monitoring - Impacts on seabirds and marine mammal populations - Information on ecological impacts provided to AAD and others - Conversion ratios used by AFMA for quota management purposes
Landed catch monitoring 1. Toothfish Catch Documentation Scheme 2. Unload monitoring	1. Verified landed weight and product destination of all toothfish products 2. Weight and grade of landed catch of all other species	AFMA	Every cruise	-*Dissostichus* catch documents provided to CCAMLR to monitor toothfish take by CCAMLR members -Monitoring of catch against Individual Transferable Quotas (ITQ's) and monitoring of retained bycatch by AFMA

3.4 Principle Two: Ecosystem Background

All species that are affected by the fishery and that are not part of the Unit of Certification are considered under Principle 2. This includes species that are retained for sale or personal use or that are retained due to regulations (assessed under Performance Indicator 2.1), bycatch species that are discarded (Performance Indicator 2.2), and species that are considered endangered, threatened or protected by the government in question or are listed by CITES (Performance Indicator 2.3). This section contains an evaluation of the total impact of the fishery on all components in P2 and includes both observed and unobserved fishing mortality. Unobserved mortality may occur from IUU fishing, biota that are injured and subsequently die as a result of coming in contact with fishing gear, ghost fishing, waste, or biota that are stressed and die as a result of attempting to avoid being caught by fishing gear. This section also considers impacts on marine habitats (Performance Indicator 2.4) and the ecosystem more broadly (Performance Indicator 2.5).

The Macquarie Island Region extends 200 nautical miles out from Macquarie Island covering an area of approximately 47.6 million hectares and has unique biogeographical characteristics and geological make-up. The geomorphic units consist of canyons, deep escarpments, knolls, ridges, trenches, slope and abyssal plains. Macquarie Island is the exposed crest of the Macquarie Ridge, a component of the oceanic crust formed in deep water as a spreading ridge and raised as the Indian-Australian tectonic plate interacts with the Pacific plate (Australian Heritage Commission, 2000). The overall north-south trend of the ridge means that it acts as a major barrier to the Antarctic Circumpolar Current, the earth's largest and most important oceanic current. It is an area where three main bodies of water are separated by two oceanic fronts (Sub-Antarctic Front and Antarctic Polar Front) creating a complex range of habitats. 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 is suggested that there might be at least six different large-scale oceanographic habitats in the Region (EA, 2001). The ridge not only separates two hydrological regions, but also separates areas of distinctive marine life associations with representatives from south-east Australia, southern New Zealand and other regions of the Southern Ocean, many of which are at the southern or northern limit of their range (Butler et al., 2000).

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. The Region provides important habitat during various life stages of five species of seals and 38 species of seabirds (Scott, 1994). Macquarie Island is one of few terrestrial habitats in the Pacific sector of the Southern Ocean for marine mammals and seabirds which require land for breeding and moulting. Resident seal species include the southern elephant seal, *Mirounga leonina*, Antarctic fur seal *Arctocephalus gazella* and New Zealand fur seal *A. forsteri*. The sub Antarctic fur seal *A. tropicalis* is present on the island from December to October.
Main seabirds are present in the vicinity of the island during the breeding and moulting periods. These include the king, *Apenodytes patagonicus*, royal, *Eudyptes schlegeli*, rockhopper *E. chrysocome* and

gentoo *Pygoscelis papua* penguins, the Macquarie shag *Phalacrocorax purpurascens* and the black-browed albatross *Diomedea melanophrys*, northern *Macronectes halli* and southern *M. giganteus* giant petrel and Antarctic prion *Pachyptila desolata*,. The Macquarie Island population of wandering albatrosses (*Diomedea exulans*) is the smallest in the world with only 20 breeding pairs.

Macquarie Island and its associated islets were listed in the Register of the National Estate in 1980.The Island and waters out to 12 nautical miles were inscribed on the World Heritage List in 1997.

There is significant protection of the Macquarie Island region through area closures and Commonwealth and State marine protected areas. 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 km2 (~ 34%) of the EEZ around the island. These State and Commonwealth marine reserves 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 (AFMA 2010a): the historical trawl grounds mainly focused on approximately 130km^2 of the Aurora Trough region (AFMA 2010d; the Macquarie Ridge component of the fishery covers a larger area but there is relatively little fishing that occurs within this area and most of it is too deep for demersal fishing.

3.4.1 Available Information

There is extensive information available on the Macquarie Island marine ecosystem through work undertaken for the State and Commonwealth Marine Protected Areas (EA, 2001; NOO, 2002; Commonwealth of Australia, 2005), protected species and their recovery plans (DEH 2004a, Terauds 2006; SEWPaC 2011a, 2011b), risk assessments (Daley et al., 2008; AFMA 2009a, 2009b, 2011; Zhou & Fuller, 2011), and targeted studies on trophic interactions (Goldsworthy et al. 2001) benthic impacts (Dell et al., 2016) and specific research on the target species (e.g. Fay, 2011, Fay and Tuck 2011, Fay et al. 2011) and individual bycatch species (e.g. van Wijk et al., 2001, 2003; Laptikhovsky, 2005). Based on this work, key elements of the ecosystem are known and understood.

The fishery's interaction with the ecosystem is recorded in logbooks and through 100% observer coverage of all fishing activities. This provides sound information on the non-target catch, bycatch species and ETP interactions.

Non-target Catch

Regardless of whether operating a trawl or longline vessel, it is a condition of a statutory fishing right that the holder must not target marine life other than Patagonian toothfish. The fishery is managed with a general strategy of "nil discards" to reduce provisioning of seabirds and mammals. The strategy for managing non-target species is that vessels have a total (retained and discarded) bycatch limit of 200 t applied to all teleost species, crabs and sharks with a 50 t limit on any one species. The bycatch of the trawl and longline components of the fishery are generally similar, consisting mainly of teleost species such as whiptails, cods and icefish. When operating, the trawl method caught larger amounts of jellyfish, sponges, algae and coral compared to longline.

In practice, the bycatch of longline vessels is very low (Table 4). On average, total bycatch is < 7% of the total catch and the bycatch of any particular species or species group is less than 5t in any year (< 2%). All teleost species (which form ~ 90% of bycatch by weight) and most small elasmobranch species are macerated and retained onboard and periodically released overboard outside the Macquarie Island EEZ. Large sharks, (particularly sleeper sharks), coral, sponges and crabs are generally discarded overboard after capture.

Total bycatch of trawlers when they operated was also generally low (< 10%) (Table 5), and was converted into fishmeal and retained onboard. Again, large sharks, coral, sponges, algae and crabs were generally discarded overboard after capture in the trawl net. There was only one year when the catch of a particular species group (algae) was greater than 5% of the total catch.

Ecological risk assessments have been undertaken on both trawl and longline sub-fisheries and found there are no target, bycatch, by-product or protected species considered to be at high risk from the effects of fishing (Daley et al., 2008; AFMA 2009a, 2009b, 2011; Zhou & Fuller, 2011).

Southern Sleeper Shark (*Somniosus antarcticus*) is an extremely large low productivity dogshark that gets caught very occasionally by both trawl and longline methods. These large sharks are released if captured, but their survival rate once they are released is uncertain. Because of their low productivity, we have classified them as a “main” bycatch species due to their vulnerability even though their catches only represent < 1% of the total catch. Similarly, Porbeagle Sharks (*Lamna nasus*) which also only represent < 1% of the total catch, have been classified as a “main” bycatch species due to their vulnerability. Porbeagle Shark was listed as vulnerable by the IUCN in 1996 and again assessed as vulnerable in 2006. This, however, only relates to the Mediterranean and north Atlantic populations.

In March 2013, porbeagle shark, was one of five shark species listed on Annex II of CITES which came into effect in September 2014. Porbeagle Shark is a protected migratory species under the Part 13 provisions of the EPBC Act. Francis et al. (2017) states that the stock status of porbeagle sharks remains uncertain, but is potentially low for the southern stock.

Although small sharks may sometimes be ground into meal or macerated and retained on board, large sharks such as those above are almost always discarded immediately after capture. They are therefore considered under section 2.2 on bycatch.

Table 4. Average annual bycatch caught by longline in the Macquarie Island Toothfish Fishery summarized from observer data from 2009/10 – 2015/16 compared to the catch of toothfish. The two species highlighted are considered as main species under MSC criterion due to their vulnerability.

Species	Av. Annual Catch (kg) 2009/10 - 2015/16				
	Retained	Mealed	Discarded	Total	% of catch
Dissostichus eleginoides	360,862	2,465	5,947	369,274	94.87%
Macrourus holotrachys	141	5,543	0	5,684	1.46%
Antimora rostrata	68	5,364	6	5,437	1.40%
Macrourus carinatus	13	1,998	0	2,010	0.52%
Somniosus antarcticus	0	5	1,989	1,993	0.51%
Macrourus sp_	1	1,934	10	1,945	0.50%
Chimaera sp_1	1	962	0	963	0.25%
Lamna nasus	0	150	453	603	0.15%
Lepidion sp_	8	370	0	378	0.10%
Amblyraja hyperborea	0	246	0	246	0.06%
Rocks	0	0	163	163	0.04%
Lithodes murrayi	1	83	26	109	0.03%
Lithodidae	4	91	7	101	0.03%
Ebinania sp_	0	61	0	62	0.02%
Somniosus rostratus	4	14	20	38	0.01%
Ophidiidae	8	23	0	32	0.01%
Bathyraja sp_ (Macquarie ridge)	0	26	0	26	0.01%
Diastobranchus capensis	0	25	0	25	0.01%
Coral	0	4	21	25	0.01%
Muraenolepis sp_	1	22	0	22	0.01%
Gorgonians	0	8	13	21	0.01%
Others	3	62	25	90	0.02%

Table 5. Annual bycatch caught by trawl in the Macquarie Island Toothfish Fishery summarized from observer data. Algae (unknown species) is highlighted because it comprised >5% of the catch in one year.

		Fishing Season							
	Retained	2005/06		2006/07		2007/08		2008/09	
Species		Trawl	Longline	Trawl	Longline	Trawl	Longline	Trawl	Longline
Dissostichus eleginoides	Yes	275,732		238,582	85,358	242,896	150,467	309,074	218,778
Macrourus holotrachys	Yes							5,507	6,501
Macrourus carinatus	Yes	1,046		0			8,187	49	326
Macrourus whitsoni	Yes			288	4,911	3,367		348	
Coryphaenoides subserrulatus						24		805	
Other Macrourids	Yes	131		51		0	24	55	621
Somniosus antarctica	No	5,818		1,788	1,037	4,501	1,000	9,235	4,500
Antimora rostrata	Yes	440		1	2,609	16	6,452	415	2,435
Lepidonotothen squamifrons		364		76		5		8	
Chimaera spp_	Yes				3		1,359		
Halargyreus johnsonii		126						31	
Elasmobranchs	Yes						386		
Other Fish	Yes	249		15	304	137	1,246	61	141
Cephalopods	Yes	119		35		16		108	
Jellyfish	No	40		19		65		139	
Lithodes murrayi	No			290		1,423	6	271	23
Lithodid Crabs	No	184			1				4
other crustacea	No	0		0				65	0
Corals and Sponges	No	3,155			4	373	1	15	37
Other invertebrates	No	58		0	0	19		21	3
Algae	No					6,176		23,630	
Total Catch		287,461	0	241,147	94,227	259,019	169,127	349,839	233,368
Total Bycatch		11,729	0	2,564	8,869	16,123	18,660	40,765	14,590
% Bycatch				1%	9%	6%	11%	12%	6%

Bait

Approximately 40 t of squid is used for bait during each longline trip. This is usually sourced from the New Zealand squid fisheries, which catch two species (*Nototodarus gouldii* and *Nototodarus sloanii*). In one year, squid was sourced from an Argentinian squid fishery, most likely Argentine shortfin squid (*Illex argentines*). Regardless of which fishery the bait is sourced from, the low amount compared to total catches and the high productivity of the bait species suggests it will not have a detrimental effect on the source populations.

There are generally two longline trips in each fishing year, so total bait use is about 80t compared to a total target species catch of 300-400 t. As such the total amount of bait is > 5% of the catch weight and is therefore considered as a main retained species for this assessment.

Endangered, Threatened and Protected (ETP) Species

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 Marine Protected Area (MPA) that covers more than a third of the EEZ around the island.

Direct Interactions

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 and 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. There has only been one longline interaction with a marine mammal in the last seven years. Although there are no trawl operations currently in the fishery, there is no limits on levels of interaction with ETP species in the management strategy. It is ***recommended*** that this be addressed before any trawling recommences in the fishery.

Indirect interactions

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.

Habitat and Ecosystem Impacts

Habitats

Dell et al. (2016) describes the marine habitats around Macquarie Island. Areas of high taxa diversity occur to the east of Macquarie Island and are patchily distributed along the ridge and in the isolated area of habitat, above 3000 m, on the eastern margin of the EEZ. Sponges, octocorals and lophotrochozoa (brachiapods and bryozoans) dominate these sparse benthic environments. Further, large branching sessile epifauna form important habitat for other organisms. These deep-water benthic habitats may be at least 10,000 years old and have low dispersal ability making them particularly vulnerable to physical disturbance, particularly from interactions with fishing gear. Recovery from disturbances for many deep sea coral reefs a can take decades or even centuries.

Closed areas are the main method used to protect habitats. 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 km2 (~ 34%) of the EEZ around the island.

There are also requirements on trawl fishing to minimize impact on the benthic habitats including a minimum bobbin size of 520 mm and where rockhopper gear is used, rubber discs of minimum size of 40 cm apply.

The work by Dell et al. (2016) was specifically aimed at understanding the physical impacts of both trawl and longline gear on different benthic habitat types. They achieved this by using information collected over numerous years by benthic sleds, trawls and deep sea cameras to characterise the demersal habitats of Macquarie Island at 0.5 degree grids. Based on the "ground-truthed" information above, 15 predictor variables related to sea surface properties, bottom water properties and benthic structure and depth were modelled and used to extrapolate these habitats out to the MITF EEZ. They estimated the level of disturbance of taxa in these grids by evaluating the footprint and fishing effort of both longline and trawl fishing since the fishery began in 1994 across the different habitats. They found that disturbance of vulnerable benthic taxa by fishing gears in this area has affected less than 4% of the biomass for each of these taxa. Greater than 96% of the biomass of all the taxa vulnerable to disturbance by fishing gear remains untouched. They also suggested that the current boundaries of the marine park may not conserve a sufficient proportion of the biomass of stylasteridae and vulnerable echinoderms from future disturbance by trawl.

The fishery is currently operated only by longline vessels and although (and because) they have less benthic impact than trawlers, they are permitted to fish in areas of the Commonwealth MPA that are not zoned as highly protected. They do not, however, currently fish in the MPAs. Also, although most of the area of the Macquarie Ridge is too deep for demersal fishing, in theory there is considerable potential for expansion of longline in the shallower grounds in this part of the fishery (and potentially trawling if it is resumed). 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 in the fishery. It is nevertheless recommended that management controls could be strengthened with explicit statements that govern or control potential expansion of the fishing footprint. They noted that the exclusive use of demersal longline since 2010 will have relieved the trawled areas from intensive gear interactions.

Ecosystem

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.

3.5 Principle Three: Management System Background

3.5.1 Area and Jurisdiction of the Macquarie Island Toothfish Fishery

Macquarie Island is a small sub-Antarctic island in the Southern Ocean located about 1,500 km south-south-east of Tasmania; about half way between Tasmania and Antarctica. The MITF operates entirely within the Australian EEZ between 3 nm out to the 200 nm boundary of the EEZ around Macquarie Island. The island and waters out to 3 nm are managed by the Tasmanian Parks and Wildlife Service and have been declared as a Nature Reserve by Tasmanian law since July 2000. Part of the EEZ has been declared a Commonwealth Marine Reserve.

The MITF is based on a single stock of toothfish within the Australian EEZ and is managed by the Australian Fisheries Management Authority (AFMA) under the *Fisheries Management Act 1991* (FMA). Despite this fishery being a single jurisdiction stock, Australia chooses to apply the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) conservation measures and precautionary harvest control rules due to its location and the fact that Australia is a signatory to the CCAMLR.

The fishery also lies within the Convention Area of the South Pacific Regional Fisheries Management Organisation (SPRFMO) that entered into force in August 2012. Australia is a signatory to the Convention, the area of which only applies to the high seas. However, should the toothfish stock 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.

3.5.2 Recognised Interest Groups

Groups recognized as having an interest in the MITF are:

- AFMA
- The Department of the Environment and Energy, in particular the Australian Antarctic Division of the Department.
- The Department of Agriculture and Water Resources
- Scientists from the CSIRO
- CCAMLR
- SPRFMO
- Fishers with access rights to the fishery
- New Zealand Fisheries (with regard to tag and recapture research)
- Tasmanian Government

- Conservation groups including Australian Conservation Foundation, the Australian Marine Conservation Society and the World Wild Fund for Nature (WWF).

Consultations Leading to the Formulation of the Management Plan

The MITF is managed under the *Macquarie Island Toothfish Fishery Management Plan 2006* (the MITF Management Plan) and was developed in accordance with the requirements of sections 17 and 17A of the FMA which specifies the consultation that must be conducted in development of a statutory management plan for Commonwealth managed fisheries.

The FMA requires that AFMA make public through a notice in the Commonwealth Gazette and in newspapers in each Australian State and Territory, its intention to determine a management plan, make a copy available for public comment and invite comment on the plan. AFMA is also required to maintain a register of persons or organisations, compiled by way of public invitation to register, who are to be notified when AFMA publishes a notice advising that it intends to determine a management plan. These same requirements apply to any subsequent amendment of the management plan. The MITF Management Plan was last amended in 2016.

The draft management plan was developed in consultation with the SouthMAC which includes members from AFMA, ADD, the fishing industry and a conservation organization. The draft was then provided for public comment in accordance with the above procedures.

On-going Consultations with Interest Groups

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 fulfil 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. MACs 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.

As noted above, the MAC that covers the management of the MITF, along with other Antarctic and subAntarctic fisheries under Australian jurisdiction, is SouthMAC. The seven statutory members of SouthMAC comprise two from industry, one from the conservation community (currently from the

Tasmanian Conservation Trust), a research member, and one from AAD (policy branch). In addition, the MAC membership includes the AFMA manager responsible for the fishery, an Executive Officer and an independent Chair. Observers may also attend meetings of the MAC.

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 prepared by CSIRO and reviewed by SARAG which provides advice to SouthMAC and the AFMA Commission. SARAG is currently composed of an independent Chair and an executive officer and seven members including four government scientists (two from AAD and two from CSIRO), the AFMA manager and two industry members. Observers may also attend these meetings.

The operation, roles and responsibilities of MACs and RAGs are specified by AFMA in Fisheries Management Paper No. 1 (AFMA, 2015a) and Fisheries Administration Paper No. 12 (AFMA, 2014) respectively. Both papers have been amended recently to provide clarity around declarations of interests and interpretation of conflicts of interest.

SouthMAC meets twice a year and SARAG meets several times a year. The most recent SARAG meeting was held in September 2016.

Given the stability of the stock around Macquarie Island and to align with CCAMLR stock assessments, the MITF has recently moved to a stock assessment being completed every two years. Details of the stock assessment is provided to CCAMLR for their information only.

Planned Education and Training for Interest Groups

There are no specific education and training programs planned for interest groups. However, the extensive range of consultation mechanisms used in the fishery provide opportunities for interest groups, including fishers and conservation groups, to engage in and form a better understanding of the management and conduct of the fishery.

3.5.3 Non-fishery Uses or Activities and Arrangements for Liaison and Coordination

Macquarie Island is a United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Site and tourist groups can visit if they have a permit. The AAD has a research station on the island that is home to studies in climate science and an array of other Antarctic research programs. The remoteness of Macquarie Island limits the number of activities at this location.

3.5.4 Decision Making Processes

AFMA is the key decision making body for the MITF and the Commonwealth Department of Agriculture and Water Resources provides overarching policy advice to AFMA. The fishery is managed by AFMA in accordance with the FMA. In addition, the AAD, a division of the Commonwealth Department of the Environment and Energy manages the fishery in accordance with other domestic legislation such as the

Environmental Protection and Biodiversity Conservation Act 1999. For example, fisheries must meet obligations in accordance with the Seabird threat abatement plan that is legislated under the EPBC Act.

Fisheries Administration Paper 12 clarifies key decision making processes associated with the delivery of scientific advice in the pursuit of AFMA's legislative objectives. This includes the interactive processes, respective roles and responsibilities between the AFMA Commission, Resource Assessment Groups (RAGs) and Management Advisory Committees (MACs) (see Figure 3 sourced from AFMA, 2014). Unless delegated by the Commission, all committees/groups are advisory rather than decision making.

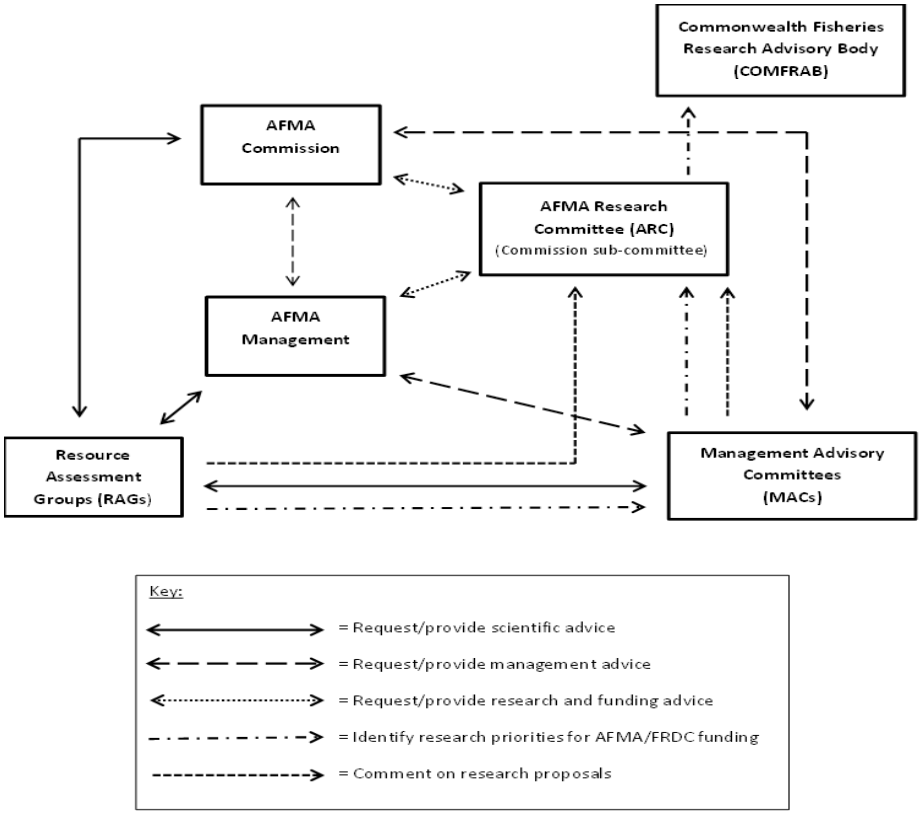

Figure 3: Diagrammatic representation of committees and flow of information and interactions (Sourced from AFMA, 2014).

The interactive process for setting the TAC for example, starts with scientists from CSIRO, in collaboration with scientists from AAD, completing a stock assessment which is referred to the SARAG for consideration. The SouthMAC members consider the advice from SARAG, form a recommendation on the TAC which is referred to the AFMA Commission to make the final decision.

While responsibility for the implementation of fisheries management decisions and AFMA's day-to-day business affairs resides with the Chief Executive Officer, AFMA's operations are overseen by seven

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, 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 Commission is responsible for setting the policy framework and for ensuring that adequate resources and expertise are available to meet AFMA's legislative obligations. The outcomes of board meetings are reported to stakeholders as well as to the public through the AFMA website.

3.5.5 Objectives for the Fishery

The MITF Management Plan specifies the objectives for the fishery, consistent with those in 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 Australian Fishing Zone (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.

While not in the CCAMLR Area, AFMA chooses to apply the CCAMLR principles of precautionary management to the MITF which includes the objective of maintaining a stock at a proportion of its pre-exploitation abundance. This objective is articulated into operational objectives in the form of specific biological reference points that form the basis of decision rules. These are:

- that the probability that spawning biomass will fall below 20% of the pre-exploitation level over the 35-year projection period must 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.

3.5.6 Fisheries Regulations to Meet Objectives

The MITF Management Plan provides the overarching framework for regulating the MITF. This is supported by Directions made by AFMA and specific conditions on SFRs, such as the CCAMLR Conservation measures which apply to the fishery.

The primary regulatory measures in the fishery is the setting of a single TAC and its allocation as ITQs to a limited number of operators. This is supported by a range of reporting and other obligations on SFR holders, gear controls, temporal closures, 100% observer coverage and limits on bycatch. A summary of the regulatory measures that apply to the MITF is provided in Table 6 (AFMA, 2013).

3.5.7 Access Rights

The MITF is a limited entry fishery. SFRs for toothfish, allocated under the MI Management Plan, are held by 2 SFR holders. These SFRs take the form of individual transferable quota, representing a share in the annual TAC. Currently, only one company, Australian Longline, operating one vessel, the Antarctic Discovery is operating in the fishery. The MI Management Plan makes provision for a minimum quota holding of 25.5% of all the statutory fishing rights in the fishery. This means that no more than three vessels can operate in the MITF. Since the 2010/11 season, toothfish have been solely taken using longline.

Table 6: Summary of the regulatory measures that apply to the MITF

Management Plan	Supporting instruments
▪ Sub Antarctic Fisheries Bycatch and Discard Workplan requirements ▪ Fishery assessment plan requirements ▪ Reference points ▪ Determination of TAC ▪ Minimum quota holding requirements ▪ Quantity of fish that may be taken including overcatch provisions ▪ Scientific research ▪ Granting of SFRs ▪ Boat nomination ▪ Transferring and leasing of fishing rights ▪ Environmental requirements ▪ Reporting of gear loss ▪ No poultry or brassicas are to be discarded from the boat ▪ Nil offal overboard ▪ Restrictions on the use of plastic packaging bands ▪ Limited light at night ▪ Reporting of death or serious injury of seabird and marine mammals ▪ Obligations on holders of SFRs to minimize bycatch, carriage of observers and requirement to comply with regulations and fishery assessment plan ▪ Contingency arrangements for breakdown of meal plant, disposal of fish meal and injury or death of seabird or marine mammal ▪ Fishing area	**Directions** ▪ Prohibition on fishing methods other than trawling or longlining **Conditions on SFRs** ▪ Boat eligibility ▪ Bycatch restrictions ▪ Gear limitations (i.e. paired steamer lines) ▪ Gear seasonal restrictions (longline between 15 April and 31 August) ▪ Environmental obligations (including CCAMLR Conservation Measures) ▪ Vessel Monitoring System obligations ▪ Transshipping and carrying requirements ▪ Reporting obligations ▪ Carriage of two scientific observers ▪ Landing/fish disposal obligations ▪ Contingency arrangements for breakdown of meal plant ▪ Contingency arrangements for disposal of fish meal ▪ Navigating in closed zones

3.5.8 Review and Audit of the Management Plan

The MITF Management Plan provides (Section 7 (2), (3) and (4)) that:

- AFMA and the MAC must, at least once every 5 years, assess the effectiveness of the Management Plan including the measures taken to achieve the objectives of this Management Plan by reference to the performance criteria mentioned in subsection (1). (1).
- AFMA must include in its annual report for a financial year a statement of the extent to which the performance criteria mentioned in subsection (1) were met in the year.
- Each year, the MAC must assess the extent to which performance criteria mentioned in subsection (1) have been met in that year.

The effectiveness of some elements of the management plan is also subject to review by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) and the Department of the Environment and Energy. ABARES conducts an annual assessment of the status of stocks and the economics of fisheries managed by AFMA. The Department of the Environment and Energy has conducted regular, five-year reviews of the MITF under the Guidelines for the Ecologically Sustainable Management of Fisheries. The processes for this external review has recently changed with a decision by the Government that the maximum period of accreditation of a fishery under the EPBC Act be extended from five to ten years for low-risk fisheries such as the MITF. The List of Exempt Native Species has recently been amended to include fish taken in the MITF, thereby extending export approval until October 2026.

3.5.9 Fishery Research Plan

The current research plan for the MITF is the Antarctic Fisheries Strategic Research Plan 2014/15 – 2018/19 (AFMA 2015b). The plan is developed and reviewed annually by SARAG. The plan identifies areas of high priority research and provides for research to underpin stock assessment, collection of fishery and biological data and to assess ecological aspects of the fishery. An annual call for research applications addressing the priorities in the strategic research plan is made and applications are assessed for funding either from the AFMA Research Fund or the Fisheries Research and Development Corporation.

The strategic research plan is used to develop the fishery assessment plan (FAP) which is a requirement of the MITF Management Plan and details the formal collaboration between industry and research providers. The FAP is developed every 2 years 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.

4. Evaluation Procedure

4.1 Harmonised Fishery Assessment

For this assessment, harmonization is required as follows:

Principle 1: Not required, target stock Patagonian toothfish (*Dissostichus eleginoides*) does not overlap with any other fishery.

Principle 2: Not required. There are toothfish fisheries with the same gear type but not overlapping. They are operating in a very different fishing area and may still have different bycatches and habitat impacts and management.

Principle 3: Harmonisation should be considered in the case of any overlapping parts of Principle 3. This can only be said for the overarching management system as it relates to the AFMA system.

Table 7: Fisheries in the MSC System Considered for Harmonization.

Fishery	Status	Principles for Harmonization	Conformity Assessment Body
1 HIMI Patagonian toothfish (*Dissostichus eleginoides*)	Certified, in re-assessment	Principle 3 (related to AFMA system only)	SCS Global Services
2. Australian HIMI Mackerel Icefish	Certified, 1st re-assessment	Principle 3 (related to AFMA system only)	SCS Global Services
3. Australian Blue Grenadier	Certified, 1st surveillance audit	Principle 3 (related to AFMA system only)	SCS Global Services
4. Australian Northern Prawn Fishery	Certified, 3rd surveillance audit	Principle 3 (related to AFMA system only)	MRAG Americas
5. Walker Seafood Australian albacore, yellowfin tuna and swordfish longline	Certified	Principle 3 (related to AFMA system only)	ME Certification

Table 8: Alignment of Scores for Harmonization

PI	This assessment	Fishery 1	Fishery 2	Fishery 3	Fishery 4	Fishery 5	Comments
3.1.1	100	90	100	100	100	85	Despite the unconditional pass assigned in each fishery, the Fishery 1 score related to a CCAMLR issue and Fishery 5 concluded that the dispute resolution mechanism had been tested and proven at the national (AFMA) level but not at the regional level through the Western and Central Pacific Fisheries Commission (WCPFC).

							These issues are not relevant to this assessment. The Conformity Assessment Body (CAB) for fishery 5 also noted that the legal rights of customary fishers were absent from national fisheries legislation although acknowledged that they are recognized through the *Native Title Act 1993*.
3.1.2	100	100	100	100	100	85	Fishery CAB was scored lower due to the absence of formal reporting of the AFMA Commission decision making and queried whether AFMA facilitated effective engagement beyond individuals and entities with known interest in fisheries management.
3.1.3	100	95	100	100	100	90	The assigned score in Fishery 1 related to an issue identified in the French Management system. Fishery 5 scored lower as a result of the WCPFC long term objectives, including the precautionary approach, not been fully operationalized. Neither of the above issues are relevant to this assessment.
3.1.4	90	90	90	90	100	90	The score of 90 for Fisheries 1 – 3 was assigned noting that although the fishery was subject to regular internal and external review, incentives were not explicitly considered. Fishery 5 scored 90 on this due to some issues relating to consensus-based decision-making in the WCPFC to ensure unsustainable fishing practices were avoided.

4.2 Previous assessments

This fishery was first certified in May 2012 and this is the first re-assessment. One condition was raised in the initial assessment in Principle 1 (Performance Indicator 2.4.3). This condition was closed during the fourth surveillance audit in 2016.

Table 9. Summary of Previous Assessment Conditions

Condition	Closed?	Justification
PI. 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.	Y	A recent study by Dell et al. (2016) "Interactions between demersal fishing gears and macro-benthos around subantarctic Macquarie Island" used information collected over numerous years by benthic sleds, trawls and deep sea cameras to characterise the demersal habitats of Macquarie Island at 0.5 degree grids. Based on the "ground-truthed" information above, 15 predictor variables related to sea surface properties, bottom water properties and benthic structure and depth were modelled and used to extrapolate these habitats out to the MITF EEZ. This study describes the major habitats and those which would be vulnerable to fishing activities on a spatial and temporal scale of relevance to the fishery and thereby meets element 1 of SG80. Dell et al. (2016) estimated the level of disturbance of taxa in these grids by evaluating the footprint and fishing effort of both longline and trawl fishing since the fishery began in 1994 across the different habitats. They found that disturbance of vulnerable benthic taxa by fishing gears in this area has affected less than 4% of the biomass for each of these taxa. Their modelling suggested that the current boundaries of the marine park may not conserve a sufficient proportion of the biomass of stylasteridae and vulnerable echinoderms from future disturbance. Nevertheless, there is ongoing collection of fine scale spatial information on the footprint of fishing across these demersal habitats and the method adopted allows for future assessment of potential impacts of fishing, (noting that trawling is not currently undertaken in the MITF). This meets element 2 and 3 of SG 80. Although there is regional information available from certain areas where fisheries operate, the distribution of habitat types is not known over their entire range. There is no program to measure changes in habitat distribution over time and the physical impact of the gear on vulnerable habitats has not been fully

		quantified so a score of 100 is not met but 80 is justified.

4.3 Assessment Methodologies

This assessment was conducted by SCS Global Services, an accredited MSC certification body. The fishery was assessed using the MSC Certification Requirements Version 1.3, January 14 2013 and the reporting template used in this report is also V1.3. The default assessment tree was used without adjustments. MSC Fisheries Certification Requirements v2.0 (October 2014) was used for process only.

4.3.1 Stakeholder Identification and Engagement Process

Stakeholders were identified as per the SCS Stakeholder Engagement Procedure, which includes requesting a list of potential stakeholders and contact information from the client, evaluating overlap from stakeholder lists from other clients, and consulting with the team and identified stakeholders for their input on any additional stakeholders.

Stakeholder announcements were posted to the MSC website for each milestone of the fishery assessment. In addition to this, stakeholders were informed via email of the different milestones of the fishery assessment and when they would have an opportunity to make comments no longer than four days from the start of the consultation period. These milestones are when the fishery enters full assessment, when peer reviewers are proposed, when the Public Comment Draft Report is available for comment and when the objection period begins. These communications also included a link to the fishery assessment on the MSC website and a copy of the stakeholder comment form and MSC guide to stakeholders.

The general steps followed during the assessment were:

Announcement of Re-Assessment and Team Selection (7 July 2016)

At this first step of the assessment process, SCS submitted the announcement that the fishery had entered assessment. The notification also included the nomination of the team and the announcement of the onsite assessment dates (11-12 August 2016 in Hobart). No stakeholder submissions were received.

Input on Fishery Performance (July-August 2016)

SCS requested that the applicants compile and submit written information to the assessment team illustrating the fishery's compliance with the required performance indicators (PIs). At the same time, SCS requested that stakeholders submit their views on the fishery management system's functions and performance. Stakeholders were identified as per the SCS Stakeholder Engagement Procedure.

Meetings with Industry, Managers, and Stakeholders (11-12th August 2016)

SCS planned for an onsite meeting and conducted meetings with industry, fishery managers, and fishery scientists on the 11th and 12th August in Hobart, Tasmania. Stakeholders were invited to meet with the

assessment team. Additional documentation was requested from the client and the management agency after the meeting.

Scoring the Fishery (August 2016 – January 2017)

The assessment team reviewed and discussed the available information and determined preliminary scores on the last day of the onsite visit using the required MSC methodology and the default assessment tree, without any direct input from the client group or stakeholders.

Drafting Report (August 2016 – January 2017)

The assessment team in collaboration with the SCS representative on the team, Dr. Daume, drafted the report in accordance with MSC-required process. Before the client draft report was completed, the team participated in two rounds of discussions to review and finalise the scores. The draft was finalised in January 2017 and submitted to the client for review.

Peer Review (April 2017)

SCS, as required, released an announcement on 15th March 2017 of potential peer reviewers soliciting comment from stakeholders on the merit of the selected reviewers. No negative stakeholder comments were received and two peer reviewers were confirmed. The peer review was conducted during April 2017.

Request for additional information (22 March – 28 April 2017)

SCS, as required, released an announcement on 22nd March 2017 to request any new information relating to the fishery that the team should consider in the assessment, following CR v 2.0 7.3.4.1. Stakeholders were also informed by email but no new information was received.

Release of Public Comment Draft Report (PCDR) (15th May 2017)

SCS released the draft report for public comment, soliciting stakeholder response through posting on the MSC website and direct email to known stakeholders.

Final Report (26th June 2017)

SCS released the final report with the team determination for a 15-working day objection period. Stakeholders were informed through posting on the MSC website and direct email.

Public Certification Report TBD

4.4 Evaluation Processes and Techniques

4.4.1 Site visits

The assessment team selected visit sites and interviewees based on information needed to assess management operations of the unit of assessment. The client group and other relevant stakeholders helped identify and contact fisheries management, research, compliance, and habitat protection personnel and agency representatives. Before the site visit and meetings were conducted, an audit plan was provided to the client and relevant stakeholders. The on-site meetings took place in Hobart, Tasmania between August 11-12th 2016.

Table 10: Audit Plan: Key Meetings and Locations

Meeting number	Date	Location	Topic
1	11-12 August 2016	Hobart	Discussion of issues relating to P1, P2 and P3 Performance Indicators.

Table 11: Meeting Attendees

Name	Organization and Title
Dr. Sabine Daume	Lead auditor, SCS
Mr. Alexander (Sandy) Morison	P1 Expert, Consultant SCS
Sascha Brand-Gardner	P3 Expert, Consultant SCS
Dr. Ian Knuckey	P2 Expert, Consultant SCS
Martin Exel*	Client Representative, Austral Fisheries
Rhys Arangio*	Austral Fisheries
Paul Taylor	Client Representative, Australian Longline
Jo Fisher*	Management, AFMA
Jemery Day	Stock Assessment, CSIRO

*attended remotely

Stakeholder Consultations and Due Diligence

Stakeholders were identified and contacted as per the SCS Stakeholder Engagement Procedure (described in Section 4.3 of this report). SCS worked with MSC outreach in advance of the fishery entering full assessment, to compile an extensive stakeholder list used for emailing announcements and assessment progress to stakeholders. This list contained individuals and organizations spanning the government, private, and non-profit sectors.

4.4.2 Evaluation Techniques

The assessment team received a detailed submission of documents related to the fishery and its management system from the client prior to the onsite meeting. Further documents were requested from the client as well as AFMA and AAD and received throughout the initial stages of the assessment process and before the client draft report was finalised.

Media Announcements

At the start of the process a list of stakeholders was created based on individuals and organizations previously engaged in MSC assessments in the region. Several names were added throughout the process while the team became aware of their interest. All public announcements were sent separately by email to the whole list of identified stakeholders.

Documentation

One of the most significant, and difficult, 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 actively engaged in issues associated with fisheries in the same geographic location.

AFMA and AAD were key in providing many of the scientific analyses, figures as well as operational and regulatory information, and were helpful and cooperative throughout the process.

Scoring Process

The scoring methodology followed the procedure described in Section 27.10 of the MSC Certification Requirements v2.0.

The Assessment Team member responsible for each Principle led the discussion on that Principle and drafted the scores and rationales to justify the score for that Principle. Other team members also asked questions or responded in turn during the onsite meeting and helped facilitate communication between the team and the client and scientists of the fishery. Scoring was initiated during the site visit and completed iteratively through phone calls, emails and skype teleconferences between June and September 2016. Following the onsite visit, the team compiled a list of requested documents that were conveyed by the client coordinator, to the relevant parties. These materials were returned to the team leader and disseminated to the team by the team leader. In cases where consensus cannot be reached, the scoring process calls for the scores to be decided by the team leader with consideration of the recommendation of the pertinent Principle expert. This was not the case with any of the performance indicators during this assessment.

The scoring elements considered under each of the Principles are outlined in Table 12. None were considered data deficient or requiring the use of the RBF for the assessment.

Decision Rules for Final Outcome

The decision rules for MSC certification is as follows:

- No PIs score below 60 (cannot receive certification)
- The aggregate score for each Principle, rounded to the nearest whole number, is 80 or above
- The aggregate score for each Principle is calculated by taking the average score for each section followed by the average of all the section scores.

Scoring was completed by consensus through team meetings and exchanging rationales by email and draft score and report sharing.

Table 12 A. Scoring elements - Trawl

Component	Scoring elements	Main/not main	Data-deficient or not
Target species	Patagonian Toothfish (*Dissostichus eleginoides*)	NA	Not data deficient
Retained species	Grenadiers and whiptails (*Macrourus spp*) Violoet cod (*Antimora rostrata*)	Not main Not main	Not data deficient
Bycatch	Southern sleeper shark (*Somniosus antarcticus*)	Main	Not data deficient
ETP	Seabirds Marine mammals	NA	Not data deficient

*main species are classified by MSC as those species of which the catch is ≥5% of the total catch by weight, or if they are particularly vulnerable.

Table 12 B Scoring elements - Longline

Component	Scoring elements	Main/not main	Data-deficient or not
Target species	Patagonian Toothfish (*Dissostichus eleginoides*)	NA	Not data deficient
Retained species	Grenadiers and whiptails (*Macrourus spp*) Violoet cod (*Antimora rostrata*)	Not main Not main	Not data deficient
Bait	Squid	Main	Not data deficient
Bycatch	Southern sleeper shark (*Somniosus antarcticus*)	Main	Not data deficient
	Porbeagle shark (*Lamna nasus*)	Main	Not data deficient
ETP	Seabirds Marine mammals	NA	Not data deficient

*main species are classified by MSC as those species of which the catch is ≥5% of the total catch by weight, or if they are particularly vulnerable.

5. Traceability

5.1 Eligibility Date

The target eligibility date is the date of the re-certification of the fishery and is expected in July 2017. The traceability and segregation systems that are required to ensure the separation of any certified product from non-certified product are believed to be already in place for the client fleet.

(REQUIRED FOR PCR ONLY)

The report shall include:

- ***The actual eligibility date.***
- ***The rationale for any difference in this date from the target eligibility date***

5.2 Traceability within the Fishery

A description of the tracking, tracing and segregation systems 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 with CCAMLR Conservation Measure 10-03 and the CCAMLR catch documentation required by Conservation Measure 10-05
- 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 and verification of fishing logs).

An evaluation of the possibility 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. 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 noting when it was shot, including 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 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 fishing company (e.g. Australian Longline) and by the authorized officer in the port of unloading (e.g. 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, and 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.

An evaluation of the opportunity for substitution of certified fish with non-certified fish prior to and at the point of landing.

There is no risk of substitution because there is no other vessel fishing outside the UoC. This is the only vessel fishing in the Macquarie Island Toothfish fishery.

A description of the at-sea processing of catch.

- 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, product weight, conversion factor and gross weight.
- Collars - Size, # of boxes and average box weight
- 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.

Details of the use of trans-shipping in the fishery.

There is no trans-shipping in the fishery.

Details on the number and/or location of points of landing.

The toothfish is landed in New Zealand (in Nelson and Dunedin) and in Australia (Burnie and Devonport, Tasmania).

An evaluation of the robustness of the management systems related to traceability.

Austral Fisheries' and Australian Longline's management system that also covers fishery operations for Mackerel Icefish and Patagonian Toothfish at HIMI is very robust with very little risk of potential mixing of certified with uncertified product. There is no other toothfish fishery in the area.

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 a container from being unknowingly 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.

5.2.1 Eligibility to Enter Further Chains of Custody

A conclusion and determination of whether the product will be eligible to enter further certified chains of custody

Toothfish landed by the registered vessel Antarctic Discovery using longline and processed at sea and on shore, are eligible to seek and secure MSC chain of custody certification in order to sell product derived from the fishery with the MSC claim. Toothfish at Macquarie Island is now almost entirely caught by longline. However, any fish caught by demersal trawl (stratified trawl surveys etc) also be eligible to be sold as certified.

A list of parties, or category of parties, eligible to use the fishery certificates

Only Austral Fisheries Pty Ltd and Australian Longline Pty Ltd fishing for Patagonian Toothfish are eligible to use the fishery certificate.

A list of eligible points of landing

Toothfish gets landed at the dock in Nelson and Dunedin, New Zealand and in Australia in ports at Burnie and Devonport, Tasmania.

The point of change of ownership, from which Chain of Custody (CoC) certification is required.

CoC is required from the point of landing.

6. Evaluation Results

6.1 Principle Level Scores

Final Principle Scores

Final Principle Scores		
Principle	**Trawl**	**Longline**
Principle 1 – Target Species	96.9	96.9
Principle 2 – Ecosystem	91.3	91.7
Principle 3 – Management System	96.8	96.8

6.2 Summary of Scores

Principle	Component	PI No.	Performance Indicator (PI)	Trawl	Longline
One	Outcome	1.1.1	Stock status	100	100
		1.1.2	Reference points	100	100
		1.1.3	Stock rebuilding	N/R	N/R
	Management	1.2.1	Harvest strategy	95	95
		1.2.2	Harvest control rules & tools	100	100
		1.2.3	Information & monitoring	90	90
		1.2.4	Assessment of stock status	90	90
Two	Retained species	2.1.1	Outcome	80	80
		2.1.2	Management	95	100
		2.1.3	Information	95	95
	Bycatch species	2.2.1	Outcome	80	**60**
		2.2.2	Management	95	90
		2.2.3	Information	85	95
	ETP species	2.3.1	Outcome	95	100
		2.3.2	Management	85	95
		2.3.3	Information	95	95
	Habitats	2.4.1	Outcome	100	100
		2.4.2	Management	90	90
		2.4.3	Information	85	85
	Ecosystem	2.5.1	Outcome	100	100
		2.5.2	Management	90	90
		2.5.3	Information	100	100
Three	Governance & policy	3.1.1	Legal & customary framework	100	100
		3.1.2	Consultation, roles & responsibility	100	100
		3.1.3	Long term objectives	100	100
		3.1.4	Incentives for sustainable fishing	90	90
	Fishery specific mgt.	3.2.1	Fishery specific objectives	90	90
		3.2.2	Decision making processes	100	100
		3.2.3	Compliance & enforcement	100	100
		3.2.4	Research plan	90	90
		3.2.5	Mgt. performance evaluation	100	100

6.3 Summary of Conditions

One condition and three recommendations were set for the fishery (Table 13).

Table 13. Summary of Conditions

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/N/A)
1	By the second surveillance audit the client shall provide evidence that all main bycatch species caught by longline, including porbeagle shark, are within biologically based limits.	**2.2.1**	**N**

6.3.1 Recommendations

Four recommendations were also made by the team, two for the trawl sector (2.3.2, 2.4.2) if the trawl fishery resumes operation. When the trawl fishery was operating, no stated limits on ETP interactions were in place, which was considered a significant shortfall and prompted a recommendation in the initial assessment, which remains for this current assessment. The second recommendation was extended to the longline gear (2.4.2). There was an additional recommendation under Principle 3 for both UoCs. (3.2.1) re. short-term objectives for the target stock (i.e. application of the CCAMLR control rules).

Recommendation 1 (2.3.2 for UoC trawl): Before trawling resumes in the fishery, a bycatch management strategy should be developed that has specific mechanisms identified to limit interactions with seabirds, seals and other ETP species.

Recommendation 2 (2.4.2 for UoC trawl): Although limited by a variety of management arrangements in practice, including a ban in operating in the Commonwealth MPA, the footprint of trawling can potentially expand significantly. The team recommends that before trawling resumes a review should be conducted on the current management arrangements. In addition, the ERA should be updated and include habitat impacts for the trawl sector.

Recommendation 3 (2.4.2 for UoC longline): Although limited by a variety of management arrangements in practice, the footprint of the longline can potentially expand significantly, including into the Commonwealth MPA. The team recommends that a review should be conducted on the current management arrangements. In addition, the ERA should be updated and include habitat impacts for the longline sector.

Recommendation 4 (3.2.1 for both UoCs): The team recommends that objectives for the target stock (i.e. application of the CCAMLR control rules) should be clearly identifiable within the management system to help explain that while the fishery is managed by Australia in accordance with CCAMLR principles, it is outside CCAMLR waters, and so is not managed directly under CCAMLR.

6.4 Determination, Formal Conclusion and Agreement

The assessment team recommended that the fishery as defined by the Unit of Certification in section 3.1 be awarded MSC-endorsed certification based on MSC Fisheries Certification Requirements v2.0. This is based on the fact that no Performance Indicator falls below the required SG60 and also that the average score for each Principle is above 80. This decision is now available for stakeholders engaged in the assessment process to submit a supported objection if there is dissatisfaction with this determination. The objection period is 15 United Kingdom working days from the publication of this report.

7. (REQUIRED FOR PCR)

The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

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Appendix 1. Scoring and Rationales

Performance Indicator Scores and Rationale

Procedure for Scoring and Rationales

After the team compiled and analysed all relevant information, each UoA was scored against the Performance Indicator Scoring Guideposts (PISGs) in the final assessment tree (the structure of PIs and scoring guideposts that make up the evaluation). The team discussed the evidence in detail before agreeing on a final score for each PI. A brief explanation of the MSC scoring process is provided below and is explained in more detail in MSC Fisheries Certification Requirements and Guidance v2.0 (2014).
The team first assesses each PI against each scoring issue at the SG60 level. If one or more of the SG60 scoring issues is not met, the UoA fails and no further scoring is required.
If all the SG60 scoring issues are met the PI will achieve a minimum score of 60, and the team proceeds to assess each scoring issue against the SG80 level. In order to achieve an 80 score, all of the SG60 scoring issues and all of the SG80 scoring issues must be met. If not all scoring issues are met at SG80 the PI is given an intermediate score in increments of 5 (65, 70 or 75), which reflects overall performance against the SG80 scoring issues:

- The PI will score 65 when performance is slightly above 60 (few scoring issues are met at SG80 but most are not)
- The PI will score 70 when performance is mid-way between SG60 and SG80 (some scoring issues are met at SG80 and some are not)
- The PI will score 75 when performance is almost at SG80 (most scoring issues are met at SG80 and few are not)

If one or more of the SG80 scoring issues is not met, the PI is assigned a condition. Only if all of the SG80 scoring issues are met will the team proceed to assess the PI against the SG100 scoring issues. If not all scoring issues meet SG80 then the SG100 scoring issues are not scored.
In order to achieve a 100 score, all of the SG60, SG80 and SG100 scoring issues must be met. If all of the SG60 and SG80 scoring issues are met, but not all of the SG100 scoring issues are met, then the PI is given an intermediate score in increments of 5 (85, 90 or 95) which reflects overall performance against the SG100 scoring issues:

- The PI will score 85 when performance is slightly above 80 (few scoring issues are met at SG100 but most are not)
- The PI will score 90 when performance is mid-way between SG80 and SG100 (some scoring issues are met at SG100 and some are not)
- The PI will score 95 when performance is almost at SG100 (most scoring issues are met at SG100 and few are not)

When there is only one scoring issue for a PI then it may be 'partially scored' in increments of 5 if the requirements are partially met.

In Principle 1 or 2 the team scores PIs are comprised of differing scoring elements (species or habitats) that comprise part of a component affected by the UoA. If any single scoring element fails to meet SG80 then then overall score for that element shall be less than 80 and a condition is raised (regardless of whether other elements may be at SG100). The PI is given a score which reflects the number of elements at each SG rather than being a numerical average.

Principle 1

Under Principle 1, the same target species (*Dissostichus eleginoides*) is assessed covering both both gear types of the two UoCs (trawl and longline). Seven performance indicators (PIs) are used that are grouped into two key aspects of a fishery's performance: 1) The current status of the target stock resource with three PIs; and 2) Harvest Strategy (Management) with four PIs. The PIs under (1) consider the impact of the fishery on the target species, and particularly whether the stock is at sustainable levels. In contrast, the PIs under (2) consider the tools, measures or strategies that are being used specifically to manage the impact of the fishery on the target species.

PI 1.1.1		**The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Y	Y	Y
	Justification	Key conclusions from the most recent stock assessment (Day et al. 2016) are • that the stock is at 67% of unfished levels, • that the lower 95% confidence bound is also above the target levels (Figure 1), • that all sensitivity analyses also place the stock above target levels (Table 2), and • that the stock would remain above 20% of unfished levels (the point at which recruitment might be expected to become impaired) throughout the 35 year projection period under the proposed constant catch (Figure 2). Estimates of year-class strength provided by the assessment model also provide no indications that recruitment has ever been impaired. Confidence intervals around the estimates of stock status and for the stock projections (from MCMC analyses) and the sensitivity test results, indicate that there is a high degree of certainty to this conclusion. This meets the requirements of the SG 60, SG 80 and SG 100 levels.		
b	**Guidepost**		The stock is at or fluctuating around its target reference point.	There is 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.

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
	Met?		Y	Y
	Justification	The fishery for Patagonian toothfish at Macquarie Island has been developed slowly so the stock has only gradually been fished down and remains above target levels. TACs have always been set in accordance with the quite conservative CCAMLR decision rules and catches have not exceeded these limits. The level of IUU fishing has also been minimal (one IUU vessel was detected and apprehended in 2005). The 95% confidence intervals around the estimates of biomass (Figure 1) and the results of the sensitivity tests (Table) indicate that there is a high degree of certainty that the stock has always been above target levels. This meets the requirements of the SG 80 and SG 100 levels.		
References		Day et al. 2016		

Stock Status relative to Reference Points			
	Type of reference point	**Value of reference point**	**Current stock status relative to reference point**
Target reference point	Current SSB relative unfished levels (B_0)	0.5 B_0	Above: SSB = 0.67 B_0
Limit reference point	Current SSB relative unfished levels (B_0)	0.2 B_0	Above: SSB = 0.67 B_0

OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Y	Y	
	Justification	The reference points used for Patagonian toothfish 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. The changes include selecting a lower target reference point than for krill given the differences in the trophic levels of the species which means that there is not a need to make same provisions for the needs of predators of toothfish. The other main change was to extend the projection period over which the impact of proposed catches were evaluated. 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. The status of the stock relative to these reference points is estimated whenever the assessment is updated. This meets the requirements of the SG 60 and SG 80 levels.		
B	Guidepost		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		Y	Y
	Justification	The limit reference point is set at 20% of B_0, a level at which there is not an appreciable risk of impairing reproductive capacity. This meets the requirements of the SG 80 level. The method of determining future catches ensures that there is a high degree of certainty that TACs will not lead to an appreciable risk of impairing future recruitment. This meets the requirements of the SG 100 level.		

PI 1.1.2		Limit and target reference points are appropriate for the stock		
C	Guidepost		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Y	Y
	Justification	There are several ways that the Australian target reference point is precautionary so there is a high degree of certainty that it will achieve the required management objectives. 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 (BMSY) and the default level that is set in Australia's Commonwealth Harvest Strategy Policy (DAFF 2007). Although there are no estimates of BMSY for this fishery, the level at which the target is set (0.5 B0) is at least consistent with (and is likely to be above) a target of BMSY. 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 two years 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. Patagonian toothfish are known not to be a key food source for predators so there is no need for additional precaution on this account. There are no other issues that would warrant a higher target reference point, which is already set at a relatively conservative level. This meets the requirements of the SG 80 and SG 100 levels.		
d	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		Not relevant	
	Justification	Patagonian toothfish is not a key low trophic level species.		
References				

PI 1.1.2	Limit and target reference points are appropriate for the stock	
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	Not relevant		Not relevant
	Justification	Not relevant. Stocks are not rebuilding		
b	**Guidepost**	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	Not relevant	Not relevant	Not relevant

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
c	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?	Not relevant	Not relevant	
References				
OVERALL PERFORMANCE INDICATOR SCORE:				
CONDITION NUMBER (if relevant):				

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
A	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	Y

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	The harvest strategy that is used for the Macquarie Island Patagonian toothfish Fishery contains all of the required elements: monitoring, stock assessment, harvest control rules and management actions. The monitoring provides key inputs to the stock assessment which then estimates the current stock status. This assessment is then used to make stock projections that determine catch levels that are consistent with the reference points that are articulated through the CCAMLR decision rules. The TACs set by AFMA have followed these recommendations. Thus all the elements work together. 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). This meets the requirements of the SG 60, SG 80 and SG 100 levels.		
b	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	N
	Justification	There is evidence from the monitoring of stock status and the fishery, and the outputs of the stock assessment that use these data, that stocks have been maintained above target levels throughout the history of the fishery. These provide good evidence that the harvest strategy for the MI fishery is achieving its objectives. The harvest strategy for this fishery had also been tested using a Management Strategy Evaluation (Fay and Tuck 2011) and shown to be robust to the known uncertainties. More recently, however, issues of post-tagging mortality and growth retardation have been shown to lead to potential over-estimation of stock status and TAC (Hillary et al. 2014) Additional work is needed to test the ability of the harvest strategy to respond appropriately over time. This meets the requirements of the SG 60 and SG 80 levels but not the SG 100 level.		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	As outlined in the background, there is a comprehensive monitoring program in place that provides both fishery-dependent and fishery-independent information on the stock (from the tagging program). These sources of information feed into the stock assessment which provide the synthesized overview of the status of the stock and the main indicator of whether the harvest strategy is working. This meets the requirements of the SG 60 level.		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Y
	Justification	The harvest strategy was reviewed to check that it complied with the requirements of Australia's Harvest Strategy Policy which was introduced in 2007. Also, given that the harvest strategy has maintained the biomass of Patagonian toothfish above target levels, additional reviews have not been necessary. This meets the requirements of the SG 100 level.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Not relevant. Sharks are not a target species.		
References		Fay and Tuck 2011; Hillary et al. 2014		
OVERALL PERFORMANCE INDICATOR SCORE:				95
CONDITION NUMBER (if relevant):				

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Generally understood harvest 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.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	Y	
	Justification	There are well defined harvest control rules in place for the Macquarie Island fishery for Patagonian toothfish that are consistent with the harvest strategy. The catches that these rules allow will reduce as the stock approaches the target reference point. Should the stock fall below this target and approach the limit reference point, the rules would further reduce catches and could lead to the fishery being closed. It is therefore clear that they will act to reduce the exploitation rate as a LRP is approached. This meets the requirements of the SG 60 and SG 80 levels.		
b	**Guidepost**		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		Y	Y
	Justification	The MCMC projections that are used to determine constant catches that would be consistent with the harvest control rules incorporate uncertainty in all model parameters including recruitment variability, growth and fishery selectivity. Uncertainty is further taken into account by the requirement that catches meet the requirements of the CCAMLR control rules over a 35 year projection period, even though the TACs would be in place for only one or two years. This precautionary aspect of the harvest control rule is designed to account for a range of uncertainties. This meets the requirements of the SG 80 and SG 100 levels.		
c	**Guidepost**	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.

PI 1.2.2		There are well defined and effective harvest control rules in place		
	Met?	Y	Y	Y
	Justification	The key tool used to implement the harvest control rules is the TAC that is set for the fishery. Compliance with the TAC is monitored through compulsory logbooks that record set by set catch and effort details and through 100% observer coverage. These provide strong evidence that catches have never exceeded the TAC and therefore that the tools used to implement these harvest control rules are effective in controlling the exploitation level from this fishery to required levels. In the first assessment of the fishery (SCS 2012), it was argued that there was not evidence that exploitation levels were being maintained at required levels because of uncertainties from the tagging data. Over the last five years, however, considerably more tagging data has been accumulated so that this uncertainty has been substantially reduced. There remains significant uncertainty about some aspects of the assessment including relative levels of recruitment and movement between northern and southern parts of the stock but these are not sufficient to undermine confidence in the overall estimates of exploitation rates. This meets the requirements of the SG 60, SG 80 and SG 100 levels.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range 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 related to the current harvest strategy, is available.
	Met?	Y	Y	N

PI 1.2.3		Relevant information is collected to support the harvest strategy		
	Justification	As indicated in the background, the information available in published papers and reports are clearly sufficient to support the harvest strategy. These provide sufficient knowledge of stock structure, good information on stock productivity and excellent information on fleet composition (there is only one active vessel). In the first assessment against the MSC standard (SCS 2012) the range of information available was not considered to be comprehensive because the data collected had 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 period of apparent high availability in the Aurora Trough has not been repeated. The issue of local variability in availability is of less importance to stock outcomes now because the integrated stock assessment covers the fishery as a whole (previously there was a separate assessment for the Aurora Trough), it is based on tagging information rather than CPUE and a single TAC is now set for the stock as a whole. Additional tagging information collected since that assessment has added to the knowledge of fish movements in the area but movement rates within the fishery (and potentially to adjacent areas) remain poorly understood as do the reasons why recapture rates are much higher in southern areas than northern areas. This meets the requirements of the SG 80 level but not of the SG 100 level.		
b	Guidepost	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.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	Y
	Justification	All the information required by the Harvest Control Rule is monitored annually and there is a good understanding of the inherent uncertainties in the data that are collected and used. This is demonstrated through the choice of factors used in sensitivity tests. The MSE testing of the harvest strategy has assisted with understanding the robustness of the assessment to the existing uncertainties. This meets the requirements of the SG 60, SG 80 and SG 100 levels.		

PI 1.2.3		Relevant information is collected to support the harvest strategy		
c	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	There is excellent information available on all fishery removals from the stock which, with the exception of the very 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. This meets the requirements of the SG 80 level.		
References		SCS 2012		
OVERALL PERFORMANCE INDICATOR SCORE:				90
CONDITION NUMBER (if relevant):				

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	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.
	Met?		Y	Y
	Justification	An integrated assessment model incorporates knowledge of the biology of Patagonian toothfish including its growth, movement and natural mortality. It is a tag-based model which appropriately deals with the nature of the fishery and important changes to it (multiple gear types and a shift from a trawl based one to a long-lined based fishery). This meets the requirements of the SG 80 and SG 100 levels.		

PI 1.2.4		There is an adequate assessment of the stock status		
b	Guidepost	The assessment estimates stock status relative to reference points.		
	Met?	Y		
	Justification	As detailed in the background, the stock assessment 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 meets the requirements of the SG 60 level.		
c	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	Y
	Justification	The major sources of uncertainty have also been identified and are recorded in the stock assessment reports (e.g. Day et al., 2016). The assessment has taken this uncertainty into account. It explores the sensitivity of outputs to a range of plausible values for model parameters and makes projections that also consider such uncertainties. Stock status is evaluated in a probabilistic way using MCMC methods to make projections of stock status under different catch levels and different fleet composition. This meets the requirements of the SG 60, SG 80 and SG 100 levels.		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			N

PI 1.2.4		There is an adequate assessment of the stock status		
	Justification	The assessment has been tested as part of MSE evaluations (Tuck 2006; Fay and Tuck 2011) and shown to perform well against a range of performance measures. This MSE work explored uncertainty in spatial dynamics, movement, biology and mortality rates, robustness of the harvest strategy to these uncertainties, and effect of the method of obtaining an abundance estimate on the performance of the harvest strategy. More recently, however, the need to address post-tagging mortality and growth retardation has been identified, as these will lead to over-estimation of stock status and TACs (Hillary et al., 2014). The stock assessment is yet to address these issues. The assessment is therefore considered to not meet the requirements of the SG 100 level.		
e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	N
	Justification	The assessment is regularly reviewed by members of SARAG. Nevertheless, for assessment against this scoring issue we consider this to be an internal review as it is a part of the normal processes of the fishery management system. No external review of the assessment has been undertaken. This meets the requirements of the SG 80 level but not of the SG 100 level.		
References		Day et al. 2016, Fay and Tuck 2011, Tuck 2006		
OVERALL PERFORMANCE INDICATOR SCORE:				90
CONDITION NUMBER (if relevant):				

Principle 2 – Trawl – UoC 1

There has been no trawling in the fishery since 2010, but both the longline and trawl components of the fishery are being considered for assessment. Although many of the issues are the same for these separate sub-fisheries, there have different levels of impact on the different components – particularly bycatch, ETP interactions and benthic impacts.

PI 2.1.1

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits	Main retained species are highly likely to be within biologically based limits	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Y	Y	N
		The fishery was initiated as a trawl fishery but longlining was introduced into the fishery during 2006/07 and this has been the sole method used since 2009/10. The trawl fishery was managed with a general strategy of "nil discards" to reduce provisioning of seabirds and mammals, but in practice this related only to retaining all teleost species (which form ~ 90% of bycatch by weight) and most small elasmobranch species. These are 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 trawl catch but were usually discarded; these will be considered under the bycatch section (2.2). 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 not been any one species that met this criterion for trawl fishing. An initial ecological risk assessment of the by-product species from the trawl sub-fishery used a productivity and susceptibility analysis to highlight 40 potentially high risk by-product/bycatch species but noted that this was largely due to missing information —poorly documented taxonomy and distribution. Further, the report noted that most by-product 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 were reduced to zero (AFMA 2009a, 2009b). The ecological risk management report (AFMA 2009b) concluded that "there are no target, bycatch, by-product 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".		

PI 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		
	Justification	Acknowledging the above, nevertheless, there are no reference points for retained species and there is no quantitative assessment of the retained species to indicate that they are fluctuating around their target reference points. This does not meet the requirement of SG100.		
b	Guidepost			Target reference points are defined for retained species.
	Met?			N
	Justification	There are no target reference points defined for the retained species.		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	NA	NA	
	Justification	There are no main retained species.		
d	Guidepost	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.		
	Met?	Y		

PI 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
	Justification	The fishery has a bycatch strategy in which vessels only target 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 (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. An initial ecological risk assessment of the by-product species from the trawl sub-fishery used a productivity and susceptibility analysis to highlight 40 potentially high risk by-product/bycatch species but noted that this was largely due to missing information —poorly documented taxonomy and distribution. Further, the report noted that most by-product 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 were reduced to zero (AFMA 2009a, 2009b). The ecological risk management report (AFMA 2009b) concluded that "there are no target, bycatch, by-product 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". This meets the requirements of the SG 60 level.
References		AFMA (2009a, 2009b); Cohen et al. (1990); Daley et al. (2008); Zhou et al. (2007)
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

PI 2.1.2

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	Y
	Justification	There is a strategy in place for managing all retained species that meets SG100. Central to this strategy is that vessels only target toothfish and a total bycatch limit (including retained species) of 200 t 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. This meets the requirements of the SG 100 level.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	The strategy is based on information directly about the trawl fishery's major bycatch species. Retained catches of individual species were very low and have been well below the 50t limit stipulated in the strategy. With 100% observer coverage, there is some objective basis for confidence that the partial strategy will work. This meets the requirement of SG80. There has been no formal testing of the strategy to verify its effectiveness in the trawl fishery. Thus, the requirements of SG100 have not been met.		

PI 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		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	100% observer coverage provided clear evidence that the strategy was being implemented successfully when the trawl fishery was operating. This meets the requirements of the SG 100 level.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	There was evidence that the strategy was achieving its overall objective. As mentioned previously, the trawl ecological risk assessment and management report (AFMA 2009a, 2009b) concluded that there were no target, bycatch, by-product or protected species considered to be at high risk from the effects of trawling in the MITF given the suite of management and conservation initiatives that are in place for the fishery. This meets the requirements of the SG 100 level.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Y	Y	Y
	Justification	The main shark species recorded as being caught by trawlers in the fishery were Sleeper Shark (usually *Somniosus antarticus* but also *S. rostratus*). These were not retained and the large sleeper sharks were released whole without being pulled on board. There is a high degree of certainty they were not finned due to 100% observer coverage This meets the requirements of the SG 100 level.		
References		Daley et al. (2008); AFMA (2009a, 2009b); Zhou et al. (2007); AAD fishery bycatch database.		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

PI 2.1.3

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	Y
	Justification	Although there was only minimal retained catch, the 100% observer coverage of the trawl fishery, provided extensive, quantitative information on the retained catch down to species level. Accurate and verifiable information is available on the catch of all retained species and the consequences of this catch on the affected populations is has been analysed using an ERA (AFMA 2009a, 2009b). This meets the requirements of SG100.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	Y
	Justification	Information on the consequences for the status of affected populations was available from ecological risk assessment of the trawl sub-fishery (AFMA 2009a, 2009b). These assessments analysed all of the retained species and are considered sufficient to estimate outcome status with a high degree of certainty. This meets the requirements of SG100.		
c	**Guidepost**	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 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**		
	Justification	The detailed observer information collected on trawl fishing was adequate to support a partial strategy to manage main retained species, thereby meeting the requirement of SG80. Information is also adequate to support a strategy to manage retained species, but there is not a high degree of certainty whether the strategy would have achieved its objective because there was no regular, comprehensive and detailed analysis and reporting of the data. This would be required before the strategy can be considered to meet the objective with a high degree of certainty. Based on the above, the high degree of certainty required to meet the requirements SG100 is not achieved.		
d	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	Y
	Justification	The catch composition of each trawl was fully monitored and recorded by either weight and/or number (depending on the species/taxon) to species level and is of sufficient detail to asses ongoing mortalities to all retained species. The observers also collected 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. This meets the requirements of SG100.		
References		Daley et al. (2008); AFMA (2009a; 2009b)		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

PI 2.2.1

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits	Main bycatch species are highly likely to be within biologically based limits	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	N
		The trawl fishery has a general "nil-discard" policy within the MITF EEZ. Large sleeper sharks, and all jellyfish, sponges, crabs, coral and algae formed a negligible part of the overall trawl catch but were usually discarded; these groups are considered under this section on bycatch. Many of the corals, sponges and algae are not identified to species level and cannot be included at the species level in the ERAs. There has been no trawling since 2009/10 so there is no updated information on trawl bycatch since this time. The maximum annual total bycatch recorded for the trawl fishery was 41 t, which occurred during 2008/09 when more than 23 t, (7% of total annual catch) of unidentified algae was caught in the net and discarded. 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. Apart from this, there is not any one bycatch species caught in sufficient quantity to be classified as a "main" bycatch species under the MSC criterion of being > 5% of the total catch by weight or to have value to the fisher. As outlined below, however, Southern Sleeper Shark (*Somniosus antarcticus*) is considered as a "main" bycatch species under the MSC criterion due to its vulnerability. <u>Southern Sleeper Shark</u> Southern Sleeper Sharks are an extremely large low productivity dogshark that gets caught very occasionally by longline methods. These large sharks often weigh well in excess of one ton for an individual. They are released from trawls if captured, but the survival rate of sharks once they are released is uncertain. 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 their low productivity, we consider them to be a less resilient species and have therefore classified them as a "main" bycatch species even though their catches only represent < 1% of the total catch.		

PI 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		
	Justification	The discarded bycatch of Southern Sleeper sharks in the trawl fishery was generally less than 6 t annually although it did reach 9.2 t in 2008/09. Nevertheless, due to their large size, annual catches would still only represent less than a dozen individuals. 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 catch rates present at the time, the risk to sleeper sharks in the trawl component of 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 of the trawl fishery (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 MPA of 162,000 km^2 compared to the main trawl grounds in the Aurora Trough of only 130 km^2, noting that the habitat and species are also represented in the MPA. Because of the concern about vulnerability, the 50 t trigger does not apply to Sleeper Sharks, nor is it included in the 200t overall cap. 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). There have been specific risk assessments on sleeper sharks (which appear to be the most vulnerable of the bycatch species) and specific management measures are in place. Without identification of coral, algae and sponges caught in trawls there cannot be considered to be a high degree of certainty that bycatch species are within biological limits, but based on the very low catches, it is highly likely they are. This meets the requirement of SG80.		
b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	N/A	N/A	

PI 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**		
	Justification	The Southern Sleeper Shark is assessed as a main bycatch species due to its vulnerability. It is not considered to be outside biological limits.		
c	**Guidepost**	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The status of some of the bycatch species is poorly known. The fishery has a bycatch strategy in which 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. This meets the requirement of SG60.		
References		Hansen 1963; Van Wijk et al. (2003); Daley et al. 2008; AFMA (2009a); AFMA (2011);		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				

PI 2.2.2

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	Y
	Justification	As for retained species, there is a strategy in place for managing bycatch species. Central to this strategy is that vessels only target toothfish and a total bycatch limit (including retained species) 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. This meets the requirements of the SG 100 level.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	The strategy is based on information directly about the fishery and there is good information available on trawl bycatch species. Discarded catches of individual species have been well below the 50 t limit stipulated in the strategy. There has been no formal testing of the strategy to verify its effectiveness if a catch exceeded the limit. Although excellent data on bycatch is collected, data is analysed and reported at SARAG meetings. However there is no formal testing of the strategy. This meets the requirements of SG80 but not SG100		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.

PI 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**		
	Met?		Y	Y
	Justification	With 100% observer coverage of all trips and no records of any breaches to this strategy, there was clear evidence that the strategy was being implemented successfully for the trawl fishery. This meets the requirements of the SG 100 level.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	There is evidence that the strategy was achieving its overall objective. The trawl ecological risk assessment and management report (Daley et al. 2008; AFMA 2009a, 2009b) concluded that there was no target, bycatch, by-product 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 SG 100 level.		
References		Daley et al. (2008); AFMA (2009a, 2009b)		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

PI 2.2.3

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	Y
	Justification	Through the 100% observer coverage (AFMA 2010), there was extensive, quantitative information available on the bycatch – usually down to species level. Accurate and verifiable information is available on bycatch species and the consequences of this catch on the affected populations is has been analysed using an ERA (Daley et al. 2008). This meets the requirements of SG100.		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	Information on the consequences for the status of most bycatch species is available from ecological risk assessment of the trawl fishery (Daley et al. 2008) but without identification of coral, algae and sponges caught in trawls, information is not sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty for these species groups. Thus, the requirements of SG80 are met but not SG100.		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
	Justification	The detailed observer information collected is certainly adequate to support a partial strategy to manage bycatch species, thereby meeting the requirement of SG80. Information is also adequate to support a strategy to manage bycatch species, but there is not a high degree of certainty whether the strategy would achieve its objective (if trawling resumed) because, as for retained species, 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. If this is not done regularly, then alternative detailed analysis and reporting of the bycatch species catch (and catch rate) is required on an annual basis. Based on the above, the high degree of certainty required to meet the requirements SG100 is not achieved.		
d	Guidepost		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 effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	N
	Justification	When trawl was operating, the catch composition of each trawl was fully monitored by observers and recorded by either weight and/or number (depending on the species/taxon) to species level and was of sufficient detail to asses ongoing mortalities of most bycatch species, but lack of identification of some species groups meant that it did not apply to all bycatch species. This meets the requirements of SG80.		
References		AAD Observer bycatch data Daley et al. (2008)		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				

PI 2.3.1

<table>
<tr><td colspan="2">PI 2.3.1</td><td colspan="3">The fishery meets national and international requirements for the protection of ETP species
The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td>Guidepost</td><td>Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.</td><td>The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.</td><td>There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td>Justification</td><td colspan="3">The ETP species that potentially interact with trawlers included 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.

Observers have reported minimal interactions with any seabirds and mammals – the details of every interaction are recorded and reported. There was one incident where a juvenile male southern elephant seal was found dead in a trawl net. There were differing reports about the decomposition state of this animal when caught (Williams et al.' 2001; 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.

There have been significant changes to the national and international requirements for protection of ETP species since trawling last occurred in the fishery in 2007/08. The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species but not with a high degree of certainty.

The trawl sector meets the requirements of SG80 but not SG100.</td></tr>
<tr><td>b</td><td>Guidepost</td><td>Known direct effects are unlikely to create unacceptable impacts to ETP species.</td><td>Direct effects are highly unlikely to create unacceptable impacts to ETP species.</td><td>There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.</td></tr>
</table>

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
	Met?	Y	Y	Y
	Justification	There were only a few seabird or marine mammal interactions with the trawl sector when it was operating. Ecological risk assessments for trawling have been conducted and have considered interactions with ETP species. The residual risk assessment of the trawl fishery (AFMA 2009a) found no high risk species given the suite of management and conservation initiatives that are in place for the fishery. Thus, there is a high degree of confidence that there are no significant detrimental effects from trawlers on ETP species. This is confirmed with 100% observer coverage. The trawl sector meets the requirements of SG100.		
c	**Guidepost**		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	Y
	Justification	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". The trawl sector meets the requirements of SG100.		
References		AFMA 2009a, 2009b Goldsworthy et al. 2001		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

PI 2.3.2

PI 2.3.2		The fishery has in place precautionary management strategies designed to: • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	N

PI 2.3.2		The fishery has in place precautionary management strategies designed to: • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species.		
	Justification	A critical part of the strategy (AFMA, 2010) is the ban on discarding any bycatch that may attract or encourage foraging of birds or seals around trawl vessels. There is a 3 nm closure to any fishing around Macquarie Island and an extensive MPA out to the EEZ in which trawling is fully banned. Trawl fishing operations in the MITF were 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. The Bycatch Action Plan (2003) included the following for trawl operations: "All data on interactions is reviewed annually by SAFAG and made available to researchers, environmental agencies, CCAMLR and the public upon request……If the number of reported incidents of seabird or marine mammals increases substantially, AFMA will review mechanisms to reduce the level of interactions." Because there has been no trawling for over six years and therefore no update to the strategy, it cannot be assumed that its design now achieves above national and international requirements for the protection of ETP species. When it was operating, the trawl fishery was in full compliance with recovery plans for birds and elephant seals. Although there were requirements to monitor "substantial" increases in trawl effort, this was not specified and there were no stated limits on ETP interactions. This shortfall prompted a recommendation in the initial assessment "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". The trawl strategy meets the requirements of SG80 but the recommendation above is retained for the current assessment.		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	N

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
	Justification	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 net-sonde 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 Australian Commonwealth 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 meets SG80 but not SG100.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	When the trawl fishery was operating, 100% observer coverage supported there had been no breaches of the strategy. This provides clear evidence that the strategy was being implemented successfully. This meets the requirements of SG100.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.

PI 2.3.2		The fishery has in place precautionary management strategies designed to: • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species.		
	Met?			N
	Justification	With no trawling occurring, there is no evidence that the strategy is currently achieving its objective.		
References		DEWR (2006); Williams et al. (2001); Terauds et al. (2006); SEWPAC (2011a; 2011b).		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				

Recommendation 1: Before trawling resumes in the fishery, a bycatch management strategy should be developed that has specific mechanisms identified to limit interactions with seabirds, seals and other ETP species.

PI 2.3.3

PI 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.		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	Y
	Justification	Based on the 100% observer coverage and the methods of monitoring ETP species interactions, there was abundant, high quality information on the trawl interactions with ETP species (AFMA, 2010a). Information is collected on 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. This meets the requirements of SG100.		

PI 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	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	100% observer coverage provides accurate and verifiable information on the magnitude of all ETP impacts, mortalities and injuries. The information is sufficient to be used in assessments or ERAs to generally determine the consequences for the status of ETP species. Inspection of the Observer Manual used at the time trawling was operating revealed that observers specifically monitored 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. 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). A full assessment of the potential consequences of any interactions on the status ETP populations, particularly critically endangered sub-populations of seabirds is required before the fishery meets the requirements of SG100.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy 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.
	Met?	Y	Y	Y
	Justification	The observer information is adequate to support a comprehensive strategy to manage impacts and evaluate the whether the strategy is meeting its objectives.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

PI 2.4.1

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	Y
	Justification	Extensive Marine Protected Areas encompass more than one third of the Macquarie Island. 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 was historically taken and represents < 1% of the EEZ (AFMA, 2010). The Macquarie Ridge component of the fishery covers a large 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. This meets the requirements of the SG 60 and SG 80 level. A recent study by Dell et al. (2016) "Interactions between demersal fishing gears and macro-benthos around subantarctic Macquarie Island" used information collected over numerous years by benthic sleds, trawls and deep sea cameras to characterise the demersal habitats of Macquarie Island at 0.5 degree grids. Based on the "ground-truthed" information above, 15 predictor variables related to sea surface properties, bottom water properties and benthic structure and depth were modelled and used to extrapolate these habitats out to the MITF EEZ. This study describes the major habitats and those which would be vulnerable to fishing activities on a spatial and temporal scale of relevance to the fishery. Dell et al. (2016) estimated the level of disturbance of taxa in these grids by evaluating the footprint and fishing effort of both longline and trawl fishing since the fishery began in 1994 across the different habitats. They found that disturbance of vulnerable benthic taxa by fishing gears in this area has affected less than 4% of the biomass for each of these taxa. Greater than 96% of the biomass of all the taxa vulnerable to disturbance by fishing gear remains untouched. They also noted that the exclusive use of demersal longline since 2010 will have relieved the trawled areas from intensive gear interactions. This study provides evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. This meets the requirements of the SG 100 level.		

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function	
References	EA (2001); Dell et al. (2016)	
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

PI 2.4.2

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	N
	Justification	The main strategy in place for managing the impact of the fishery on habitat types is through area closures and Commonwealth and State marine protected areas. 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^2 (~ 34%) of the EEZ around the island. These State and Commonwealth marine reserves are extensive compared to the relatively small footprint of the current area of the fishery, which mainly focuses on approximately 130km^2 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 40 cm apply (Daley et al. 2008). Through MPAs and fishery closures, trawling is not possible across large regions around Macquarie Island. Thus, there is a partial strategy in place that is expected to achieve the Habitat Outcome 80 level of performance or above, thereby meeting the requirements of SG60 and SG80. It is worth noting that Dell et al. (2016) suggested that the current boundaries of the marine park may not conserve a sufficient proportion of the biomass of stylasteridae and vulnerable echinoderms from future disturbance. Although most of the area of the Macquarie Ridge is too deep for demersal fishing, there are no limits to expansion of trawling should it resume. 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 current arrangements could only be considered a partial strategy until they are strengthened. Explicit statements that govern or control potential expansion of the trawl fishing footprint would be a critical aspect of a full strategy. The requirement of SG100 is not met.		

PI 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		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	N
	Justification	Information directly about the fishery impact on habitats (Dell et al., 2016) provides some objective basis for confidence that the partial strategy is working and would continue to work under the current fishery arrangements if trawling resumed. This meets the requirements of SG80. Further testing of the potential for expansion of the trawl fishery would be required before it would meet SG100.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	Each vessel that fished in the MITF had 100% observer coverage and was fitted with a Vessel Monitoring System, so any breach of MPA reserves would have been detected. There have been no breaches. This strategy would continue of trawling resumed.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	Dell et al. (2016) found that disturbance of vulnerable benthic taxa by fishing gears around Macquarie Island has affected less than 4% of the biomass of benthic taxa. Greater than 96% of the biomass of all the taxa vulnerable to disturbance by fishing gear remains untouched. They also noted that the exclusive use of demersal longline since 2010 will have relieved the trawled areas from intensive gear interactions. This provides some evidence that the strategy is achieving its objective.		
References		Dell at al. (2016).		
OVERALL PERFORMANCE INDICATOR SCORE:				90

PI 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	
CONDITION NUMBER (if relevant):		

Recommendation 2: Although limited by a variety of management arrangements in practice, including a ban in operating in the Commonwealth MPA, the footprint of trawling can potentially expand significantly. The team recommends that before trawling resumes an explicit control or limit on expansion of the trawl footprint should be considered as part of a full strategy.

PI 2.4.3

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	N
	Justification	The study by Dell et al. (2016) describes the nature, distribution and vulnerability of all main habitat types in the fishery at a level of detail relevant to the scale and intensity of the fishery. This meets the requirements of SG80. Although there is regional information available from certain areas where fisheries operate and the occurrence of vulnerable habitat is known, the distribution of habitat types is not known over their entire range. Thus the requirements of SG100 are not met.		
b	Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	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 of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	Y

PI 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		
	Justification	The work by Dell et al. (2016) was specifically aimed at understanding the physical impacts of the gear on different benthic habitat types. They achieved this by using information collected over numerous years by benthic sleds, trawls and deep sea cameras to characterise the demersal habitats of Macquarie Island at 0.5 degree grids. Based on the "ground-truthed" information above, 15 predictor variables related to sea surface properties, bottom water properties and benthic structure and depth were modelled and used to extrapolate these habitats out to the MITF EEZ. They estimated the level of disturbance of taxa in these grids by evaluating the footprint and fishing effort of both longline and trawl fishing since the fishery began in 1994 across the different habitats. They found that disturbance of vulnerable benthic taxa by fishing gears in this area has affected less than 4% of the biomass for each of these taxa. This meets the requirements of SG100.		
c	Guidepost		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).	Changes in habitat distributions over time are measured.
	Met?		Y	N
	Justification	Should trawling recommence, fine scale information of the footprint of the fishery would continue to be collected in logbooks and be verified by VMS and observer coverage. This allows further analysis of the impact of fishing on the benthic environment in the future and any increase in risk. This meets the requirements of SG80. Although evaluated from data collected over a decade or more, the study by Dell et al. (2016) only provides a single snapshot of the habitat distributions. There is no program to measure changes in habitat distribution over time. The requirement of SG 100 is not met.		
References		Dell et al. (2016).		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				

PI 2.5.1

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely 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 highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence 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.
	Met?	Y	Y	Y
	Justification	Ecological risk assessments for trawl impacts on components of the MITF (Daley et al., 2008; AFMA, 2009a, 2009b) have found that given the suite of management and conservation initiatives that are in place, there are no target, bycatch, by-product 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". Dell et al. (2016) conducted work which further strengthened the understanding of fishery impact on the benthic communities and showed the fishery had minimal impact. The combination of the results of all of the above studies provides evidence that the trawl fishery would be unlikely to disrupt key elements underlying the ecosystem structure and function to a point where there would be a serious or irreversible harm. This meets the requirements of SG100.		
References		AFMA (2011); Goldsworthy et al. (2001); Dell et al. (2016).		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

PI 2.5.2

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	There is a partial strategy which contains various measures to address 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 other bycatch. Fishing operations comply with (and exceed) international standards and the Recovery Plans for threatened Albatrosses and Giant Petrels and Sub-Antarctic seal species (AFMA 2010). Extensive closures to fishing methods in the Macquarie Island EEZ ensure a high level of representative habitats are protected, at least at the geomorphic unit level. This meets the requirements of SG80. These various measures have not been compiled into an overarching plan and the trawl fishery does not meet the requirements of SG100.		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains 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. 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.
	Met?	Y	Y	N

PI 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		
	Justification	The partial strategy takes into account the fishery-specific research information provided in AFMA (2011), Goldsworthy et al. (2001) and Dell et al. (2016) and would be expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance This meets the requirements of SG80. The separate bycatch, ETP and habitat strategies are based on well-understood functional relationships between the fishery and the components and elements of the ecosystem. Further, these measures are now in place and operational. This partially meets the requirements of SG100, but the strategy falls short of being a full plan. The strategy could be improved if there was more direct control on potential spatial expansion of the trawl fishery. The Commonwealth MPAs are purported to be comprehensive, adequate and representative of the biodiversity within each bioregion at a broad geographical extent but Dell et al. (2016) suggested that the current boundaries of the marine park may not conserve a sufficient proportion of the biomass of stylasteridae and vulnerable echinoderms from future disturbance. Should trawling resume, the trawl strategy needs to be strengthened with explicit consideration by the SARAG, SouthMAC and AFMA of the approaches to limit catches of ETP and catches of coral, sponges and algae.		
c	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	Y
	Justification	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 the fishery. It therefore meets the requirements of SG100. For the most part, it would be expected that the strategy would work		
d	**Guidepost**		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.

PI 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		
	Met?		Y	Y
	Justification	There is good evidence that the measures are being implemented successfully through the VMS and 100% observer coverage. The fishery meets the requirements of SG100.		
References		AFMA (2011), Goldsworthy et al. (2001) and Dell et al. (2016).		
OVERALL PERFORMANCE INDICATOR SCORE:				90
CONDITION NUMBER (if relevant):				

PI 2.5.3

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	There is extensive information available on the Macquarie Island marine ecosystem through work undertaken for the State and Commonwealth Marine Protected Areas (EA, 2001; NOO, 2002; Commonwealth of Australia, 2005), protected species and their recovery plans (DEH, 2004a, 2004b; Terauds, 2006; SEWPAC, 2011a, 2011b), risk assessments (AFMA, 2011; Zhou & Fuller, 2011), and targeted studies on trophic interactions (Goldsworthy et al., 2001) benthic impacts (Dell et al., 2016) and specific research on the target species (e.g. Fay, 2011; Fay & Tuck 2011; Fay et al., 2011) and individual bycatch species (e.g. van Wijk 2001, 2003; Laptikhovsky, 2005). Based on this work, key elements of the ecosystem are known and understood. This meets the requirements of SG80.		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Based on the work mentioned above, the main interactions between the fishery and these ecosystem elements can be inferred. They have also been investigated. This meets the requirements of SG100.		
c	**Guidepost**		The main functions of the components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these components in the ecosystem are understood.
	Met?		Y	Y
	Justification	The functional relationships between the fishery and major components and elements of the ecosystem are well understood. 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. Through the stock assessment work on target species, risk assessments on bycatch, by-product and ETP species, recovery plans for ETP species, benthic impacts studies and trophic studies, 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, the trawl sub-fishery meets the requirements of SG100.		
d	**Guidepost**		Sufficient information is available on the impacts of the fishery on these components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Justification	Although the stock status of all bycatch and by-product 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 including impacts on the benthic habitat (Dell et al., 2016) to allow the main consequences for the ecosystem to be inferred.		
e	Guidepost		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).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	Y
	Justification	Every shot is monitored by observers and all catches and interactions are recorded. This information is sufficient to detect any increase in risk level posed by any changes in the fishery. This meets the requirements of SG80. The information available from logbooks, 100% observer coverage, VMS and targeted research projects is sufficient to support the development of strategies to manage ecosystem impacts. Therefore, the SG100 is met.		
References		EA (2001); NOO (2002); Commonwealth of Australia (2005); DEH (2004a, 2004b); Terauds (2006); SEWPAC (2011a, 2011b), AFMA (2011); Zhou and Fuller (2011); Goldsworthy et al. 2001; Dell et al. (2016); Fay (2011); Fay and Tuck (2011); Fay et al. (2011); van Wijk (2001, 2003); Laptikhovsky (2005).		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

Principle 2 – Longline UoC 2

There are five components that need to be assessed under Principle 2, with each consisting of three Performance Indicators (PIs) each. The first PI of each component is focused on the outcome status, the second one concerns the management and the third one relates to the information available. The five components are: 1) Retained Catch; 2) Bycatch (not retained); 3) Endangered, Threatened or Protected Species; 4) Impacts on the Habitats; and 5) Impacts on the Ecosystem.

There has been no trawling in the fishery since 2010, but both the longline and trawl components of the fishery are being considered for assessment. Although many of the issues are the same for these separate sub-fisheries, there have different levels of impact on the different components.

PI 2.1.1

PI 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**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits	Main retained species are highly likely to be within biologically based limits	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Y	Y	N
		Longlining was introduced into the fishery during 2006/07 and this has been the sole method used since 2009/10. Since this time there has been virtually no retention of any non-target species by longline methods apart from some retained whiptails (mostly *Macrourus holotrachys*) and cods (*Antimora rostrata*) kept for crew meals. This has amounted to less than 2 tonnes over the last 5 years. All other non-target catch is macerated, stored and discarded outside the EEZ and will be covered under Section 2.2. 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 have particular vulnerability. There has not been any one species that meets this definition over the last five years, in fact, the total of all retained non-target species is <0.1% of the total catch. The bait that is used by longline gear is also assessed under this section. Approximately 40t of squid is used for bait during each trip which is generally sourced from New Zealand. At two trips per year, this represents about 80 t of squid which is > 5% of the annual catch, so considered a main retained species in this respect. The NZ fishery captures 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 160,000 t in 2016 of which 62,452 t was caught. Based on the biology of squid and the long-term sustainability of the New Zealand squid fishery, the use of < 100 t		

PI 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		
	Justification	product from this fishery annually will not have a detrimental effect on the source populations. In one year, squid was sourced from an Argentinian squid fishery, most likely Argentine shortfin squid (*Illex argentines*). This fishery has shown large (up to a factor of 5) inter-annual variations over the last decade and was thought to have had a temporary collapse of around 2009 but has recovered since 2011. Catches range between 200,000 and 1,000,000 t, so again, the use of < 100 t product in one year from this fishery will not have a detrimental effect on the source populations. There are no reference points for retained species and there is no quantitative assessment of the retained species to indicate that they are fluctuating around their target reference points. This does not meet the requirement of SG100.		
b	Guidepost			Target reference points are defined for retained species.
	Met?			N
	Justification	There are no target reference points defined for the retained species.		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	NA	NA	
	Justification	There are no main retained species.		

PI 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		
d	Guidepost	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.		
	Met?	Y		
	Justification	The fishery has a bycatch strategy in which 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. Fifty-six bycatch species (including the retained 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, by-product 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". This meets the requirements of the SG 60 level.		
References		AFMA (2010a); AFMA (2011); Alexander et al. (2015); Cohen et al. (1990); Zhou et al. (2007); Zhou and Fuller (2011)		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				

PI 2.1.2

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	Y
	Justification	There is a strategy in place for managing all retained species that meets SG100. Central to this strategy is that vessels only target toothfish and a total bycatch limit (including retained species) 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. This meets the requirements of the SG 100 level.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y
	Justification	The strategy is based on information directly about the fishery major bycatch species. Retained catches of individual species are virtually non-existent and have been well below the 50t limit stipulated in the strategy. Although there has been no formal testing of the strategy to verify its effectiveness if a catch exceeded the limit, observers have reported that skippers have changed fishing practices and moved away from areas if there has been too much bycatch of certain species. Given the above, there is high confidence that the strategy will work meeting the requirements of SG100.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.

PI 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		
	Met?		Y	Y
	Justification	As in the example provided above, 100% observer coverage provides clear evidence that the strategy is being implemented successfully. This meets the requirements of the SG 100 level.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	There is evidence that the strategy is achieving its overall objective. As mentioned previously, the longline ecological risk management report (AFMA 2011) concluded that there were no target, bycatch, by-product 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 SG 100 level.		
e	**Guidepost**	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Y	Y	Y
	Justification	There are three shark species recorded as being caught by longlines in the fishery over the last six years: mainly Sleeper Shark (usually *Somniosus antarticus* but also *S. rostratus*) and Porbeagle Shark (*Lamna nasus*). These are not retained and the large sleeper sharks are released whole without being pulled on board. There are no records of shark finning of any of these species having occurred at any stage in the fishery. There is a high degree of certainty to this conclusion due to the 100% observer coverage, which meets the requirements of the SG 100 level.		
References		AFMA (2011); Alexander et al. (2015); Zhou et al. (2007); Zhou and Fuller (2011); AAD fishery bycatch database.		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

PI 2.1.3

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	Y
	Justification	Although there is only minimal retained catch, the 100% observer coverage (AFMA 2016), provides extensive, quantitative information available on the retained catch down to species level. Accurate and verifiable information is available on the catch of all retained species and the consequences of this catch on the affected populations has been analysed using an ERA. This meets the requirements of SG100.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	Y
	Justification	Information on the consequences for the status of affected populations is available from ecological risk assessment of the longline sub-fishery. This assessment analyses all of the retained species and is not overly sensitive to the small levels of change in catches noted here. The information is therefore considered sufficient to support the ERA analysis of risk at species level with respect to biologically based limits. This meets the requirements of SG100.		
c	**Guidepost**	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 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		
	Justification	The detailed observer information collected is certainly adequate to support a partial strategy to manage main retained species, thereby meeting the requirement of SG80. Information is also adequate to support a strategy to manage retained species, but there is not a high degree of certainty whether the strategy is achieving its objective as explained below. More regular, comprehensive and detailed analysis and reporting of the data are required before the strategy can be considered to meet the objective with a high degree of certainty. It is not clear how often ecological risk assessments will be undertaken for the fishery but it has been over five years since the last ERA was conducted. 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 analysed 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 to meet the requirements SG100 is not achieved.		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	Y

PI 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
	Justification	The catch composition of each shot/haul is fully monitored and recorded by either weight and/or number (depending on the species/taxon) to species level and is of sufficient detail to asses 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. This meets the requirements of SG100.
References		Zhou and Fuller (2011); AFMA (2011)
OVERALL PERFORMANCE INDICATOR SCORE:		95
CONDITION NUMBER (if relevant):		

PI 2.2.1

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main bycatch species are likely to be within biologically based limits	Main bycatch species are highly likely to be within biologically based limits	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	N	N
	Justification	The longline fishery has a general "nil-discard" policy within the MITF EEZ. Large sharks (sleeper sharks and porbeagle sharks), crabs and colonial invertebrates may be released at the time of capture but the rest of the longline bycatch is macerated and retained in tanks on board before being taken outside the EEZ and pumped out to sea. Thus, we have categorized this as bycatch and virtually all of the longline bycatch is ultimately discarded. Over the last seven years, the total longline bycatch has represented < 6% of the total catch. There are no instances over the last decade where the bycatch of any one species is of sufficient quantity to be classified as a "main" bycatch species under the MSC criterion of being >5% of the total catch by weight or to have value to the fisher. As outlined below, both Southern Sleeper Shark (*Somniosus antarcticus*) and Porbeagle Sharks (*Lamna nasus*) are considered as "main" bycatch species under the MSC criterion due to their vulnerability. <u>Southern Sleeper Shark</u> Southern Sleeper Sharks are an extremely large low productivity dogshark that gets caught very occasionally by longline methods. These large sharks often weigh well in excess of		

PI 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
		one ton for an individual. They are released from the longline if captured, but the survival rate of sharks once they are released is uncertain. 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 their low productivity, we consider them to be a less resilient species and have therefore classified them as a "main" bycatch species even though their catches only represent < 1% of the total catch. The discarded bycatch of Southern Sleeper sharks is generally less than 3 t annually and only consists of a few individuals. 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 (e.g. 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 of the trawl fishery (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 MPA of 162,000 km^2 compared to the main trawl grounds in the Aurora Trough of only 130 km^2, noting that the habitat and species are also represented in the MPA. Although the fishing grounds have altered with the move to longlines, the extent of the MPA remains and there is no longline fishing in the MPA. Because of the concern about vulnerability, the 50 t trigger does not apply to Sleeper Sharks, nor is it included in the 200 t overall cap. 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). Considering the above the SG80 is met for sleeper sharks. <u>Porbeagle Shark</u> Porbeagle Sharks, which also only represent < 1% of the total catch, have been classified as a "main" bycatch species due to their vulnerability. Porbeagle Shark was listed as vulnerable by the IUCN in 1996 and again assessed as vulnerable in 2006. This, however, only relates to the Mediterranean and north Atlantic populations. In March 2013, Porbeagle Shark, was one of five shark species listed on Annex II of CITES which came into effect in September 2014. Porbeagle Shark is a protected migratory species under the Part 13 provisions of the EPBC Act. As a consequence of its listing, the fishery management arrangements for Australian commercial fisheries which may encounter *L. nasus* are accredited under Part 13, meaning it is not an offence to take the species. At the time of listing, the catch of Porbeagle Shark from all Australian fisheries

PI 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
		averaged less than one tonne per annum, with the majority of the take being from the Commonwealth Eastern Tuna and Billfish Fishery. Based on this, a positive non-detriment finding (NDF) was made where there is limited interaction under current management practices where live specimens caught are returned with as little harm as possible. Across the globe, catches of Porbeagle Shark have declined from about 1200 t to 200 t over the last decade and catches in Australian waters represented just 0.11% of the global Porbeagle Shark catch up to 2012 (Koopman & Knuckey 2014). The longline catches of Porbeagle Shark in the MITF are very low: 1.5 t in 2012/13, 1.4 t in 2013/14, 0.8t in 2014/15 and 0.3 t in 2015/16. Simpfendorfer (2014) reports that genetic data suggests a single southern hemisphere stock but that there is currently no stock assessment available for Porbeagle Sharks in the Southern Ocean. A recent analysis (Yasuko et al., 2013) used observer data from the tuna longline fishery (1994–2011) and driftnet survey (1982–1990) data to show that standardised catch per unit effort (CPUE) had "no continuous decreasing trend in the abundance of the southern porbeagle, contrary to the declining trend reported in a limited region in the South Atlantic". More recently, the WCPFC has begun a project to assess the status of porbeagle in the Southern Ocean that is funded by the Areas Beyond National Jurisdictions (Common Oceans) Tuna Project. This will build on work by Francis et al. (2014) [FAR 2014/69] and Francis (2017) [FARE 2017/12] and will include a stock assessment model, which will address both stock status and exploitation rates, and a risk assessment model, which will address exploitation rates only (Smith & Nicol 2016) [WCPFC-SC12-2016/EB-IP-12 http://www.wcpfc.int/node/27524] They concluded that "Considering its circumglobal distribution, stock status of this population should be assessed using information from the areas of its major distribution, including pelagic waters, and international coordination across oceans is necessary for the effective management of this population". A report published by Francis et al. (2014) indicated that the southern stock of Porbeagle Shark may be within biologically based limits meeting SG60 but without a formal assessment of stocks found in the Southern Ocean, it cannot be considered to be "highly likely to be within biologically based limits" thereby not meeting the requirements of SG80. The Southern hemisphere porbeagle shark assessment that is underway, should give greater certainty to its stock status.

PI 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**		
b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	N/A	N/A	
	Justification	There are no firm indications that the "main" vulnerable bycatch species are outside biologically based limits.		
c	**Guidepost**	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The status of some of the bycatch species is poorly known. The fishery has a bycatch strategy in which vessels only target 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 (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. This meets the SG60 for this guidepost.		
References		Francis et al. (2014); Hansen 1963; Van Wijk et al. (2003); Daley et al. 2008; AFMA (2009a); AFMA (2011); Koopman and Knuckey (2014); Senba et al. (2013).		

OVERALL PERFORMANCE INDICATOR SCORE:	**60**
CONDITION NUMBER 1: By the second surveillance audit the client shall provide evidence that all main bycatch species, including Porbeagle shark, are highly likely to be within biologically based limits. There is no evidence at present to determine that Porbeagle shark meets this criterion a. at the SG 80 level.	

PI 2.2.2

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	N
	Justification	As for retained species, there is a partial strategy in place for managing bycatch species. Central to this strategy is that vessels only target toothfish, a limit of three vessels (only one operating) and a total bycatch limit (including retained species) of 200 t 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. This meets the requirements of SG60. Although there is a partial strategy a catch of 50 t of a vulnerable shark species, like porbeagle sharks, may hinder recovery or may not ensure they remain above biologically based limits. However, catches of Porbeagle sharks have been very low over many years and a positive NDF was made because there is recognition of limited interaction under current management practices where live specimens caught are returned with as little harm as possible. Overall this meets the SG 80 level.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N

PI 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		
	Justification	The strategy is based on information directly about the fishery and there is good information available on the bycatch species. Discarded catches of individual species have been well below the 50 t limit stipulated in the partial strategy. There are measures in place that are considered likely to work, based on plausible argument. There is a partial strategy with bycatch limits for all species and 100% observer coverage to ensure these limits are adhered to. This meets the requirements of SG60. Observers have reported that skippers have changed fishing practices and moved away from areas if there has been too much bycatch of certain species – with actual instances particularly related to Porbeagle Shark. Thus, we believe there is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved. This meets the requirements of SG80 There has been no formal testing of the strategy to verify its effectiveness if a catch exceeded the limit. Further, although excellent data on bycatch is collected, there does not appear to be an annual process whereby this data is analysed and reported so that performance against the strategy can be assessed and any required management action determined. This does not meet the requirements of SG100.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	With 100% observer coverage of all trips and no records of any breaches to the partial strategy, there is clear evidence that the strategy is being implemented successfully and adhered to. This meets the requirements of the SG 100 level.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	There is evidence that the strategy is achieving its overall objective. The longline ecological risk management report (AFMA, 2011) concluded that there was no target, bycatch, by-product 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 SG 100 level.		

PI 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	
References	Confidential AFMA observer reports. Stevens et al. (2006)	
OVERALL PERFORMANCE INDICATOR SCORE:		90

PI 2.2.3

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	Y
	Justification	Through the 100% observer coverage (AFMA, 2016), there is extensive, quantitative information available on the bycatch down to species level. Accurate and verifiable information is available on bycatch species and the consequences of this catch on the affected populations is has been analysed using an ERA. This meets the requirements of SG100.		
b	Guidepost	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	Y
	Justification	Information on the consequences for the status of affected populations is available from ecological risk assessment of the longline sub-fishery. This assessment analyses all of the bycatch species. The information is therefore considered sufficient to support the ERA analysis of risk at species level with respect to biologically based limits. This meets the requirements of SG100.		
c	Guidepost	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch, and evaluate with a high degree of certainty whether the strategy is achieving its objective.

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
	Met?	Y	Y	N
	Justification	The detailed observer information collected is certainly adequate to support a partial strategy to manage bycatch species, thereby meeting the requirement of SG80. Information is also adequate to support a strategy to manage bycatch species, but there is not a high degree of certainty whether the strategy is achieving its objective because, as for retained species, 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 it has been over five years since the last ERA was conducted. If this is not done regularly, then alternative detailed analysis and reporting of the bycatch 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 formalised 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 analysed 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 to meet the requirements SG100 is not achieved.		
d	**Guidepost**		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 effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	Y

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch
	Justification	The catch composition of each shot/haul is fully monitored by observers and recorded by either weight and/or number (depending on the species/taxon) to species level and is of sufficient detail to asses ongoing mortalities of all bycatch species. This is sufficient detail to assess ongoing mortalities to all bycatch species. This meets the requirements of SG100.
References		Confidential observer reports AAD Observer bycatch data Zhou and Fuller (2011)
OVERALL PERFORMANCE INDICATOR SCORE:		95
CONDITION NUMBER (if relevant):		

PI 2.3.1

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	Y
	Justification	Although outside the region of CCAMLR, the MITF is managed in accordance with the Conservation Measures adopted by CCAMLR. Longline vessels comply with the Threat Abatement Plan for seabirds (Commonwealth of Australia, 2014) and exceed international requirements. 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 no interactions with any seabirds and only one interactions with mammals during 2014 when an Antarctic Fur Seal was hooked during the haul whilst trying to take toothfish off the line. The effects of the fishery do not have unacceptable impacts. The longline sector meets the requirements of SG100.		

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
b	Guidepost	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	Y
	Justification	A range of international best practice methods to avoid the capture of seabirds has been adopted by the autolongliners used in the MITF because they also operate in the HIMI fishery under CCAMLR. Interactions with marine mammals do not appear to be an issue for longlines. There have been no seabird interactions with the longline sector and only one marine mammal interaction as mentioned above. Ecological risk assessments for the longline have been conducted and have considered interactions with ETP species. 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 sector meets the requirements of SG100.		
c	Guidepost		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	Y
	Justification	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". The longline sector meets the requirements of SG100.		
References		AFMA 2011; 2013; Goldsworthy 2001		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				

PI 2.3.2

PI 2.3.2		The fishery has in place precautionary management strategies designed to: • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	Y
		There is a comprehensive strategy in place for managing longline ETP interactions (AFMA, 2010). The major ETP concern with longlining in Southern Ocean is the potential for interactions with seabirds. A critical part of the 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, including seasonal closures (longline fishing is only currently permitted between 15 April and 30 August each year). Strict guidelines that were above the requirements to meet international standards were introduced to mitigate seabird capture during the initial longline trials (AFMA, 2010). 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. Under seabird management arrangements, seabirds were categorised into three levels based on their vulnerability. If one seabird from category one was killed then fishing would have had to cease for the remainder of the season. If one seabird from category 2 and one from category three were taken then operations could have continued, but any additional seabird death would have resulted in the cessation of fishing for the season. Category one species include: 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 exceeds international requirements. No seabirds were killed nor were there any interactions with longline gear during the initial longline trial. Following the trial, the AFMA Commission decided that these mitigation measures should continue for future operations.		

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
	Justification	In addition to the above gear specific requirements, there is a 3 nm closure to any fishing around Macquarie Island and an extensive MPA out to the EEZ. 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 which meets the requirements of SG100.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	N
	Justification	As mentioned above, there is a comprehensive strategy in place for managing longline ETP interactions (AFMA, 2010) and it is mainly based on information directly from the fishery. 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. The longline fishery meets the requirements of SG80.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
	Met?		Y	Y
	Justification	One hundred per cent observer coverage supports there has been no breaches of the strategy over the last decade of longline operation. This provides clear evidence that the strategy is being implemented successfully. This meets the requirements of SG100.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	100% observer coverage has documented the lack of interactions with any seabirds by the longline sector and minimal interactions with any other ETP species. This is evidence that strategy is achieving its objective. This meets the requirements of SG100.		
References		Commonwealth of Australia (2014); DEWR (2006); Williams et al. (2001); Terauds et al. (2006); SEWPAC (2011a; 2011b).		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

PI 2.3.3

PI 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.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	Y

PI 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.**		
	Justification	Based on the 100% observer coverage and the methods of monitoring ETP species interactions, there is abundant, high quality information on the longline interactions with ETP species (AFMA, 2010a). Information is collected on 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. This therefore meets the requirements of SG100.		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	100% observer coverage provides accurate and verifiable information on the magnitude of all ETP impacts, mortalities and injuries. The information is sufficient to be used in assessments or ERAs to generally determine the consequences for the status of ETP species. 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). A full assessment of the potential consequences of any interactions on the status ETP populations, particularly critically endangered sub-populations of seabirds is required before the fishery meets the requirements of SG100.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy 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.
	Met?	Y	Y	Y
	Justification	The observer information is adequate to support a comprehensive strategy to manage impacts and evaluate the whether the strategy is meeting its objectives.		

PI 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.**
References	
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	

PI 2.4.1

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	Y
		Extensive Marine Protected Areas encompass more than one third of the Macquarie Island EEZ. 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 was historically taken and represents <1% of the EEZ (AFMA, 2010). The Macquarie Ridge component of the fishery covers a large 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. This meets the requirements of the SG 60 and SG 80 level.		

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	Justification	A recent study by Dell et al. (2016) "Interactions between demersal fishing gears and macro-benthos around subantarctic Macquarie Island" used information collected over numerous years by benthic sleds, trawls and deep sea cameras to characterise the demersal habitats of Macquarie Island at 0.5 degree grids. Based on the "ground-truthed" information above, 15 predictor variables related to sea surface properties, bottom water properties and benthic structure and depth were modelled and used to extrapolate these habitats out to the MITF EEZ. This study describes the major habitats and those which would be vulnerable to fishing activities on a spatial and temporal scale of relevance to the fishery. Dell et al. (2016) estimated the level of disturbance of taxa in these grids by evaluating the footprint and fishing effort of both longline and trawl fishing since the fishery began in 1994 across the different habitats. They found that disturbance of vulnerable benthic taxa by fishing gears in this area has affected less than 4% of the biomass for each of these taxa. Greater than 96% of the biomass of all the taxa vulnerable to disturbance by fishing gear remains untouched. They also noted that the exclusive use of demersal longline since 2010 will have relieved the trawled areas from intensive gear interactions. This study provides evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. This meets the requirements of the SG 100 level.
References		EA (2001); Dell et al. (2016)
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

PI 2.4.2

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	N
	Justification	The main strategy in place for managing the impact of the fishery on habitat types is through area closures and Commonwealth and State marine protected areas, in addition to vessel number limitations. 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^2 (~ 34%) of the EEZ around the island. These State and Commonwealth marine reserves are extensive compared to the relatively small footprint of the current area of the fishery, which mainly focuses on approximately 130km^2 of the Aurora Trough region (AFMA, 2010d). Less than 1% of the Macquarie Island EEZ is fished (AFMA, 2010a). Through MPAs and fishery closures, there is a partial strategy in place that is expected to achieve the Habitat Outcome 80 level of performance or above, thereby meeting the requirements of SG60 and SG80. It is worth noting that Dell et al. (2016) suggested that the current boundaries of the marine park may not conserve a sufficient proportion of the biomass of stylasteridae and vulnerable echinoderms from future disturbance. The fishery is currently operated only by longline vessels and although (and because) they have less benthic impact than trawlers, they are permitted to apply to government, to fish in areas of the Commonwealth MPA that are not zoned as highly protected. They do not, however, currently fish in the MPAs. 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 in the fishery. Nevertheless, the current arrangements could only be considered a partial strategy until they are strengthened. The requirement of SG100 is not met.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.

PI 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		
	Met?	Y	Y	N
	Justification	Information directly about the fishery impact on habitats (Dell et al., 2016) provides some objective basis for confidence that the partial strategy is working and will continue to work under the current fishery arrangements. This meets the requirements of SG80. Further testing of the potential for expansion of the longline fishery would be required before it would meet SG100.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	Each vessel that fishes in the MITF has 100% observer coverage and is fitted with a Vessel Monitoring System, so any breach of MPA reserves will therefore be detected. There have been no breaches.		
d	**Guidepost**			There is some evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	Dell et al. (2016) found that disturbance of vulnerable benthic taxa by fishing gears around Macquarie Island has affected less than 4% of the biomass of benthic taxa. Greater than 96% of the biomass of all the taxa vulnerable to disturbance by fishing gear remains untouched. They also noted that the exclusive use of demersal longline since 2010 will have relieved the trawled areas from intensive gear interactions. This provides some evidence that the strategy is achieving its objective.		
References		Dell at al. (2016).		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				

Recommendation 3: Although limited by a variety of management arrangements in practice, the footprint of the longline can potentially expand significantly, including into the Commonwealth MPA. The team recommends that a review should be conducted on the current management arrangements. In addition, the ERA should be updated and include habitat impacts for longline sector.

PI 2.4.3

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	N
	Justification	The study by Dell et al. (2016) describes the nature, distribution and vulnerability of all main habitat types in the fishery at a level of detail relevant to the scale and intensity of the fishery. This meets the requirements of SG80. Although there is regional information available from certain areas where fisheries operate and the occurrence of vulnerable habitat is known, the distribution of habitat types is not known over their entire range. Thus the requirements of SG100 are not met.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	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 of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	Y

PI 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**		
	Justification	The work by Dell et al. (2016) was specifically aimed at understanding the physical impacts of the gear on different benthic habitat types. They achieved this by using information collected over numerous years by benthic sleds, trawls and deep sea cameras to characterise the demersal habitats of Macquarie Island at 0.5 degree grids. Based on the "ground-truthed" information above, 15 predictor variables related to sea surface properties, bottom water properties and benthic structure and depth were modelled and used to extrapolate these habitats out to the MITF EEZ. They estimated the level of disturbance of taxa in these grids by evaluating the footprint and fishing effort of both longline and trawl fishing since the fishery began in 1994 across the different habitats. They found that disturbance of vulnerable benthic taxa by fishing gears in this area has affected less than 4% of the biomass for each of these taxa. This meets the requirements of SG100.		
c	**Guidepost**		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).	Changes in habitat distributions over time are measured.
	Met?		Y	N
	Justification	Fine scale information of the footprint of the fishery continues to be collected in logbooks and is verified by VMS and observer coverage. This allows further analysis of the impact of fishing on the benthic environment in the future and any increase in risk. This meets the requirements of SG80. Although evaluated from data collected over a decade or more, the study by Dell et al. (2016) really only provides a single snapshot of the habitat distributions. There is no program to measure changes in habitat distribution over time. The requirement of SG 100 is not met.		
References		Del et al. (2016).		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				

PI 2.5.1

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely 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 highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence 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.
	Met?	Y	Y	Y
	Justification	Ecological risk assessments for longline impacts on components of the MITF (AFMA, 2011) have found that given the suite of management and conservation initiatives that are in place, there are no target, bycatch, by-product 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". Dell et al. (2016) conducted work which further strengthened the understanding of fishery impact on the benthic communities and showed the fishery had minimal impact. The combination of the results of all of the above studies provides evidence that the fishery is unlikely to disrupt key elements underlying the ecosystem structure and function to a point where there would be a serious or irreversible harm. This meets the requirements of SG100.		
References		AFMA (2011); Goldsworthy et al. (2001); Dell et al. (2016).		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

PI 2.5.2

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	There is a partial strategy which contains various measures to address 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 other bycatch. Fishing operations comply with (and exceed) international standards and the Recovery Plans for threatened Albatrosses and Giant Petrels and Sub-Antarctic seal species (AFMA, 2010). Extensive closures to fishing methods in the Macquarie Island EEZ ensure a high level of representative habitats are protected, at least at the geomorphic unit level. This meets the requirements of SG80. These various measures have not been compiled into an overarching plan and the fishery does not meet the requirements of SG100.		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains 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. 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.
	Met?	Y	Y	N

PI 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		
	Justification	The partial strategy takes into account the fishery-specific research information provided in AFMA (2011), Goldsworthy et al. (2001) and Dell et al. (2016) and would be expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance This meets the requirements of SG80. The Commonwealth MPAs are purported to be comprehensive, adequate and representative of the biodiversity within each bioregion at a broad geographical extent but Dell et al. (2016) suggested that the current boundaries of the marine park may not conserve a sufficient proportion of the biomass of stylasteridae and vulnerable echinoderms from future disturbance. The separate bycatch, ETP and habitat strategies are based on well-understood functional relationships between the fishery and the components and elements of the ecosystem. Further, these measures are now in place and operational. the strategy falls short of being a full plan, therefore not meeting the SG 100.		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	Y
	Justification	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 the fishery. It therefore meets the requirements of SG100. For the most part, it would be expected that the strategy would work		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	Y

PI 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	
	Justification	There is good evidence that the measures are being implemented successfully through the VMS and 100% observer coverage. The fishery meets the requirements of SG100.	
References		AFMA (2011), Goldsworthy et al. (2001) and Dell et al. (2016).	
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			

PI 2.5.3

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	There is extensive information available on the Macquarie Island marine ecosystem through work undertaken for the State and Commonwealth Marine Protected Areas (EA, 2001; NOO, 2002; Commonwealth of Australia, 2005), protected species and their recovery plans (DEH, 2004a, 2004b; Terauds, 2006; SEWPAC, 2011a, 2011b), risk assessments (AFMA, 2011; Zhou & Fuller, 2011), and targeted studies on trophic interactions (Goldsworthy et al., 2001) benthic impacts (Dell et al,. 2016) and specific research on the target species (e.g. Fay, 2011, Fay & Tuck 2011, Fay et al., 2011) and individual bycatch species (e.g. van Wijk, 2001, 2002, 2003; Laptikhovsky, 2005). Based on this work, key elements of the ecosystem are known and understood. This meets the requirements of SG80.		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
b	Guidepost	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Based on the work mentioned above, the main interactions between the fishery and these ecosystem elements can be inferred. They have also been investigated. This meets the requirements of SG100.		
c	Guidepost		The main functions of the components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these components in the ecosystem are understood.
	Met?		Y	Y
	Justification	The functional relationships between the fishery and major components and elements of the ecosystem are well understood. 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. Through the stock assessment work on target species, risk assessments on bycatch, by-product and ETP species, recovery plans for ETP species, benthic impacts studies and trophic studies, 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, the longline sub-fishery meets the requirements of SG100.		
d	Guidepost		Sufficient information is available on the impacts of the fishery on these components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the components and elements to allow the main consequences for the ecosystem to be inferred.

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Met?		Y	Y
	Justification	Although the stock status of all bycatch and by-product 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 including impacts on the benthic habitat (Dell et al., 2016) to allow the main consequences for the ecosystem to be inferred.		
e	Guidepost		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).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	Y
	Justification	Every shot is monitored by observers and all catches and interactions are recorded. This information is sufficient to detect any increase in risk level posed by any changes in the fishery. This meets the requirements of SG80. The information available from logbooks, 100% observer coverage, VMS and targeted research projects is sufficient to support the development of strategies to manage ecosystem impacts. Therefore, the SG100 is met.		
References		EA (2001); NOO (2002); Commonwealth of Australia (2005); DEH (2004a, 2004b); Terauds (2006); SEWPAC (2011a, 2011b), AFMA (2011); Zhou and Fuller (2011); Goldsworthy et al. 2001; Dell et al. (2016); Fay (2011); Fay and Tuck (2011); Fay et al. (2011); van Wijk (2001, 2002, 2003); Laptikhovsky (2005).		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

Principle 3

Under Principle 3 the management system is assessed covering both both gear types of the two UoCs (trawl and longline). The intent of Principle 3 is to ensure that there is an institutional and operational framework, appropriate to the size and scale of the fishery, for implementing Principles 1 and 2, that is capable of delivering sustainable fisheries in accordance with the outcomes articulated by Principles 1 and 2. The Assessment Tree structure divides the performance indicators into two categories: the first, 1) Governance and Policy, captures the broad, high-level context of the fishery management system within which the fishery under assessment is found, it has four PIs and the second, 2) Fishery Specific Management System, has five PIs, and focuses on the management system directly applied to the fishery undergoing assessment.

PI 3.1.1

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	Y

	Justification	The Macquarie Island Toothfish Fishery (MITF) constitutes a single stock, and operates within the Australian Fishing Zone and is managed by AFMA under National Fisheries legislation. The key pieces of legislation are the *Fisheries Administration Act 1991* and the *Fisheries Management Act 1991* (FMA). This legislation sets out AFMA's responsibilities in relation to the pursuit of ecological sustainable development which delivers management outcomes consistent with MSC principles 1 and 2. The main legislative instrument for management of the fishery is the *Macquarie Island Toothfish Fishery Management Plan 2006*. The Plan is a statutory instrument established under the FMA. The explicit objectives of the Plan states that the exploitation of the resources of the fishery and related activities are to be conducted in a manner consistent with the principles of ecologically sustainable development. National policies such as the Commonwealth Harvest Strategy Policy and the Commonwealth Policy on Fisheries Bycatch govern the actions of AFMA which also ensure that the management outcomes are consistent with Principles 1 & 2. While the MITF is outside the Convention Area of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). CCAMLR Resolution 10/XII calls on Members of CCAMLR, which includes Australia, to ensure that vessels flying their flag harvest stocks which are also found in the Convention Area do so responsibly and with due respect for Convention Measures adopted by CCAMLR. AFMA requires that fisheries in waters adjacent to the CCAMLR area, which includes Macquarie Island, are managed in a complementary manner to the CCAMLR requirements. AFMA implements relevant CCAMLR Conservation Measures as conditions on the Statutory Fishing Rights (SFRs). The fishery also lies within the Convention Area of the South Pacific Regional Fisheries Management Organisation (SPRFMO) that entered into force in August 2012. Australia is a signatory to the Convention, the area of which only applies to the high seas. However, should the toothfish stock 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. AFMA works closely with its near neighbours as part of a multinational plan that encourages collaboration to detect and deter illegal, unreported and unregulated (IUU) fishing. The Regional Plan of Action (RPOA) to promote responsible fishing practices is a joint initiative of Australia and Indonesia that was endorsed by 11 Ministers of the participating countries in 2007. The RPOA has made a significant contribution to eliminating IUU fishing in the Southern Ocean. As with all Commonwealth managed fisheries, the MITF is subject to assessment against the Guidelines for the Ecologically Sustainable Management of Fisheries under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The processes for this external review has recently changed with a decision by the Government that the maximum period of accreditation of a fishery under the EPBC Act be extended from five to ten years for low-risk fisheries. The List of Exempt Native Species has recently been amended to include fish taken in the MITF, thereby extending export approval until October 2026.

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
		The Macquarie Island Commonwealth Marine Reserve is one of 14 marine reserves managed under the *South-east Commonwealth Marine Reserves Network Management Plan 2013 – 2023* and established under the EBPC Act. The Reserve overlaps with the area of the fishery however, operators must comply with the activities outlined in this Plan.		
		Other EPBC Act obligations include compliance with the threat abatement plan for seabirds. The management system for the MITF lies within a national legal system and there are binding procedures in place that govern cooperation with other parties such as CCAMLR and the SPRFMO. The FMA and EPBC Act require application of the precautionary approach and the adoption of measures to ensure ecologically sustainable development which deliver management outcomes consistent with MSC Principles 1 and 2.		
b	**Guidepost**	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.	The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.
	Met?	Y	Y	Y
		The Australian management system has well established mechanisms for administrative and judicial appeals of decisions taken in respect of the fishery. A person affected by a relevant decision made by AFMA who is dissatisfied with the decision may seek a reconsideration of that decision by AFMA. A relevant decision is defined in section 165(1) of the FMA. AFMA must within 45 days of receiving the request, reconsider the relevant decision and may make a decision in substitution of the relevant decision, whether on the same terms or not, or revoke the relevant decision. AFMA's decision on reconsideration is known as a reviewable decision. Where AFMA makes a reviewable decision, a person whose interests are affected by the decision may make an application to the Administrative Appeals Tribunal for a review of the decision. Depending on the nature of the decision, the applicant may also have the right to make an application to the Federal Court for judicial review of the decision under the Administrative Decisions (Judicial Review) Act 1977 and/or the Judiciary Act 1903. These mechanisms		

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it: • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
		have been used and tested extensively by AFMA but their use has not been required in the MITF.		
	Justification	AFMA advises fishers in writing of their appeal rights and the processes involved as a matter of course when, for example, alterations are made to their fishing concession conditions. In addition to these processes, the consultation and advisory processes established by AFMA provide mechanisms for the discussion and resolution of different perspectives on fisheries management issues by stakeholders. The management system of the MITF is subject by law to mechanisms for the resolution of legal disputes. There is a mechanism in place for the resolution of disputes within the management system (SG 60). The mechanism is transparent (SG 80) and has been tested and proven to be effective (SG 100).		
d	**Guidepost**	The management system has a mechanism to generally respect 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.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Y	Y	Y

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**
	Justification	Operators in the MITF are granted access to the fishery through the allocation of SFRs. SFRs are granted under the FMA (Sections 21 and 31) where statutory management plans determined under Section 17 of the Act (such as the MITF Management Plan), exist for a Commonwealth managed fishery. Statutory fishing rights can be permanently transferred to another person or company, or leased. When SFRs are granted or purchased a Certificate of Owned Statutory Fishing Rights is issued. This specifies the type and number of SFRs owned. SFRs do not expire, they remain in force for the life of the Management Plan or until they are cancelled, surrendered or otherwise cease to have effect under the Act. AFMA maintains a register of owned SFRs on its website. In 1992, the High Court of Australia recognised native title, i.e. that indigenous Australians may continue to hold native title and to be uniquely connected to the land. The Commonwealth *Native Title Act 1993* provides the means by which the Australian legal system recognises the traditional rights and interests of Aboriginal and Torres Strait Islander people. This ensures access to fish and shellfish resources for people who depend on fishing for their food. There are no native title claims to the area of waters in which the fishery operates. There is no known occupation of Macquarie Island by Australia's indigenous population. Given the remoteness of the island from the mainland there is little likelihood that customary fishing was conducted in the waters around the island and even less likely that it was conducted in the area of waters of the MITF (i.e. outside 3 nm around the island). The management system respects (SG 60), observes (SG 80) and formally commits (SG 100) to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
References		
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

PI 3.1.2

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Y	Y	Y
	Justification	The organisations and bodies involved in the management system include the AFMA Commission, AFMA Management, SouthMAC, SARAG, CSIRO, AAD and CCAMLR in as much as the Conservation measures and harvest strategy is voluntarily adopted. The functions of AFMA are set out in section 7 of the *Fisheries Administration Act 1991*. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties The functions and roles of the MAC and RAG are defined in the *Fisheries Management Act 1991* and in AFMA policy documents (AFMA, 2014a, 2015a). CSIRO scientists (with some input from the AAD) prepare the stock assessment for the MITF. The organisations and individuals involved in the management process have been identified. Functions roles and responsibilities are generally understood (SG 60) and have been explicitly defined and are well understood (SG 80) for all areas of responsibility and interaction (SG 100).		
b	**Guidepost**	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Y	Y	Y

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
	Justification	The Australian management system includes statutory requirements for public consultation in relation to matters such as development and amendment of management plans for Commonwealth fisheries. These requirements were met in the development and subsequent amendments of the MITF Management Plan. AFMA also invites public comment on policy documents undergoing development or re-development. Other public comment opportunities include AFMA position papers regarding significant management issues such as recommended TAC settings which are placed on the website and open to all interested parties for comment. A key characteristic of the AFMA management system is the partnership approach. This approach is operationalised mainly through the operations of MACs and RAGs that report to AFMA management and the AFMA Commission. These bodies meet regularly and records of their meetings, including consideration of information obtained, are made publicly available on the AFMA web site. The Chairs summary from AFMA Commission meetings is also publicly on the website. Decisions of the AFMA Commission are published regularly through the AFMA Update which is distributed to interested stakeholders and available on the AFMA website. Some information is provided on the issues considered in reaching these decisions.		
c	Guidepost		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		Y	Y

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties
	Justification	AFMA engages with stakeholder groups through a variety of avenues, including management advisory committees, website information, liaison officers, port visits, newsletters, *AFMA Update* and direct mail across all major Commonwealth fisheries. These mechanisms provide an important advisory function and maintain an open dialogue between AFMA and those with an interest in the management of the fisheries. South MAC 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. In addition to the formal consultative mechanisms provided by the MAC and RAG there is ongoing informal correspondence between industry members and scientists and managers throughout the year. There are extensive consultation processes in place. These processes provide opportunities for all interested and affected parties to be involved (SG 80). The processes available encourage and facilitate effective engagement by these parties (SG 100 is met).
References		AFMA 2014; AFMA 2015a
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

PI 3.1.3

PI 3.1.3		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		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	Y	Y	Y

PI 3.1.3		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
	Justification	Part 3 of the Fisheries Management Act 1991 states: (1) The following objectives must be pursued by the Minister in the administration of this Act and by AFMA in the performance of its functions: (a) implementing efficient and cost-effective fisheries management on behalf of the Commonwealth; and (b) ensuring that the exploitation of fisheries resources and the carrying on of any related activities are conducted in a manner consistent with the principles of ecologically sustainable development (which include the exercise of the precautionary principle), 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) maximising the net economic returns to the Australian community from the management of Australian fisheries; and (d) ensuring accountability to the fishing industry and to the Australian community in AFMA's management of fisheries resources; and (e) achieving government targets in relation to the recovery of the costs of AFMA. (2) In addition to the objectives mentioned in subsection (1), or in section 78 of this Act, the Minister, AFMA and Joint Authorities are to have regard to the objectives of: (a) ensuring, through proper conservation and management measures, that the living resources of the AFZ are not endangered by over-exploitation; and (b) achieving the optimum utilisation of the living resources of the AFZ; and (c) ensuring that conservation and management measures in the AFZ and the high seas implement Australia's obligations under international agreements that deal with fish stocks; and (d) to the extent that Australia has obligations: (i) under international law; or (ii) under the Compliance Agreement or any other international agreement; in relation to fishing activities by Australian-flagged boats on the high seas that are additional to the obligations referred to in paragraph (c)—ensuring that Australia implements those first-mentioned obligations; but must ensure, as far as practicable, that measures adopted in pursuit of those objectives must not be inconsistent with the preservation, conservation and protection of all species of whales. These long term objectives are clear, with explicit reference to the precautionary principle, and are required by management policy. In addition, AFMA's approach to management exceeds standards required by CCAMLR. The fishery meets the requirements of SG100.
References		Fisheries Management Act 1991 available at: https://www.legislation.gov.au/Series/C2004A04237
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

PI 3.1.4

PI 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	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 perverse 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 explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Y	Y	Partial
		AFMA allocates SFRs, in the form of 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 annual TAC and allocation of ITQs provide positive incentives for sustainable fishing of the target stock. Management of broader ecosystem impacts is applied through conditions placed on SFRs that reflect the CCAMLR Conservation Measures. 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 2010 (CRIS) (AFMA 2010b) which specifies the attribution of costs of management, research and surveillance between the fishing industry and government. The CRIS specifies that industry contribute 100% of costs associated with management of domestic commercial fisheries, including costs associated: with management advisory committees; data collection and management (data management, logbooks, observers and compliance data); 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 the industry and the government depending on the flow of benefits to the industry and the broader community. Some of the costs associated with the MITF are therefore subsidised by the Government. These subsidies can be considered to provide perverse incentives to fishing operations although the robust management system is considered to counter any adverse effects of these subsidies and to ensure that unsustainable fishing practices are avoided.		

PI 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
	Justification	The MITF Management Plan requires that "AFMA and South MAC 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)". This review is reported to the AFMA Commission. The management arrangements are reviewed for ecologically sustainability under the EPBC Act and ABARES reports on the economic efficiency of the MITF annually (Patterson et. Al. 2016). The management system is subject to regular internal and external review, which ensures that it is not encouraging unsustainable fishing practices. However these reviews do not explicitly consider incentives. As a result the fishery is considered to meet the requirements of SG60 and SG80 but only the first part of SG100.
References		AFMA (2010b), DAFF (2003), Department of Finance and Deregulation (2005), Patterson et. al (2016)
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

PI 3.2.1

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
	Met?	Y	Y	Partial
		The fishery specific long term objectives are specified in the MITF Management Plan and are: (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		

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2
		(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.
	Justification	Australia's obligations under international agreements that deal with fish stocks, and other relevant international agreements. The short term objectives for the fishery are not specified as explicitly as the long term objectives but are well defined and measureable. The objectives for the target stock are reflected in the application of the CCMALR control rules which requires that stocks are maintained at a proportion of their pre-exploitation abundance such that: 1) that the probability that spawning biomass will fall below 20% of the pre-exploitation level over the 35 year projection period must not exceed 0.1; and 2) the median escapement for the fishery of the spawning biomass shall not be less than 50% over a 35 year projection For non-target species there is a singular species TAC of 50 tonnes per fishing year. This short-term management objective is explicitly prescribed in the *Macquarie Island Toothfish Fishery Total Allowable Catch Determination 2016* and is measureable. AFMA's ERM report for the MITF demersal longline sub-fishery (AFMA, 2011) states that "AFMA aims to minimise the impacts of Commonwealth fisheries on all impacts of the marine ecosystem" and the measures by which this will be achieved are specified. There is a precautionary bycatch limit of 200 tonnes combined which applies to all finfish (excluding Patagonian toothfish), crabs, sharks and rays, however there are no specific objectives in the ERM regarding minimising benthic impact. The short and long-term objectives for the fishery are consistent with achieving the outcomes expressed by MSC Principles 1 and 2 (SG 60 and 80). These objectives are explicit in the management system (SG 80). The long-term objectives are well-defined and measureable however, this is not the case for all the short-term objectives, so SG 100 is only partially met. The short-term objectives as they relate to the CCMALR control rules should be clearly identifiable and objectives for the management of habitats, would improve the score against this indicator.
References		AFMA (2011)
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

Recommendation 4 (3.2.1 both UoCs): recommends that objectives for the target stock (i.e. application of the CCAMLR control rules) should be clearly identifiable within the management system to help explain that while the fishery is managed by Australia in accordance with CCAMLR principles, it is outside CCAMLR waters, and so is not managed directly under CCAMLR.

PI 3.2.2

PI 3.2.2		**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
a	**Justification**	AFMA is required to pursue the objectives in the *Fisheries Management Act 1991* which are also reflected in the MITF Management Plan. These include ensuring that fishing is consistent with ecologically sustainable development, maximising the net economic returns to the Australian community and optimal utilisation of the living resources of the Australian Fishing Zone. AFMA must, by law, make science-based decisions AFMA consults with and seeks advice from South MAC and SARAG whose membership includes a range of stakeholders such as scientists, commercial fishers and conservation representatives. While AFMA takes their views into account it is ultimately the independent AFMA Commission that makes decisions to best pursue AFMA's objectives. There are decision-making processes in place that result in measures and strategies to achieve fishery-specific objectives (SG 60). These processes are well established (SG 80 is met).		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
b	Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	Y	Y
	Justification	The AFMA Commission's decisions are made on a timely basis and the Chair's summary is provided on the AFMA website. Agendas and minutes from the RAG and MAC meetings are also placed on AFMA's website in a timely manner to ensure the issues identified are transparent. The capacity of the MITF management system to respond to issues arising from research, monitoring, evaluation and consultation in a transparent manner has been demonstrated by the setting of TACs in response to the findings of the stock assessment and consistent with the harvest controls rules, and implementation of measures, through the ERM report, in response to the findings of the ecological risk assessment for the fishery. Outcomes of monitoring of interactions with ETP species are reported quarterly on the AFMA web site. The stock assessment and basis for setting the annual TAC are available from the AFMA web sites. The audit team did not identify any issues arising from research, monitoring, evaluation and consultation where the management system had failed to respond. As a result, the audit team concluded that the requirements of SG 60, SG 80 and SG 100 were met.		
c	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
		The precautionary approach is a central component of AFMA's and the MITF's management objectives as prescribed in the FMA. The FMA uses the following definition of the precautionary principle: Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and (ii) an assessment of the risk-weighted consequences of various options.		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
		As noted above, AFMA's management decisions must be consistent with the objectives in the FMA including the application of the precautionary principle. AFMA's decision-making processes are well established in all components of the management system. Those processes require the application of the precautionary principle and the nature of the processes, as described previously, ensures that the best available information is used.		
	Justification	Fisheries Administration Paper 12 outlines the key principles that are to be observed in relation to the respective committees/groups within AFMAs decision-making framework. One of the principles is that "advice will be evidence based and use the best available scientific information." Another principle is that "AFMA seeks, through its scientific processes and committees/groups, to obtain the best quality information and advice" and that the "scientific advisory and reporting processes will be a transparent and open process." Fisheries Management paper 1 states that the role of the research member of the MAC is to provide advice using the latest scientific developments of relevance to the fishery. Decision-making processes use the precautionary approach and are based on best available information (SG 80 is met).		
d	**Guidepost**	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Y	Y	Y

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
	Justification	Formal reporting to all interested stakeholders on the MITF's performance and management actions is provided through mechanisms including publicly available: • AFMA Annual Report • Minutes of South MAC and SARAG; • Outcomes of AFMA Commission meetings • Stock assessments and ecological risk management reports • Annual status reports conducted by ABARES • 5-yearly submissions to the Department of the Environment and Energy for consideration against the Guidelines for Ecologically Sustainable Management of Fisheries. (AFMA 2010a) Taken together these mechanisms provide comprehensive information on the fishery's performance and management actions and describe how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review. The requirements of SG 60, SG 80 and SG 100 are met.		
e	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Y	Y	Y
	Justification	The management system for the MITF is not subject to continuing court challenges and there are no legal disputes or judicial decisions arising from legal challenges that apply to the fishery. The consultative and participatory characteristics of the management system act to avoid legal disputes by engendering a strong understanding of management and a strong sense of stewardship by operators. The transparent and inclusive nature of management decision making minimizes the likelihood of legal disputes. As outlined in assessment of PI 3.1.1 the overarching management system includes comprehensive and proven dispute resolution mechanisms which would be applied if any legal disputes arose in the MITF. It is considered that the management system acts proactively to avoid disputes and that mechanisms exist to respond and comply with judicial decisions should that be necessary. The requirements of SG 60, SG 80 and SG 100 are met		

PI 3.2.2	**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.**
References	AFMA (2010a) Annual Status Report for DoEE http://www.afma.gov.au/wp-content/uploads/2010/06/Macquarie-Island-Toothfish-Fishery-Annual-Status-Report-2010.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

PI 3.2.3

PI 3.2.3		**Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive 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.
	Met?	Y	Y	Y
		AFMA's National Compliance Operations and Enforcement Policy aims to 'Effectively deter illegal fishing in Commonwealth fisheries and the Australian Fishing Zone'. In order to achieve this aim, AFMA is continuing its risk based compliance and enforcement program in 2016–17. The program will consist of four major components; 1. Communication and Education, 2. General Deterrence, 3. Targeted Risk and 4. Maintenance (AFMA, 2016a). AFMA conducts compliance risk assessments biennially and the fishery specific risks are ranked. Any issues identified through this process are relayed to industry to provide them with the opportunity to correct particular practices to ensure compliance. No compliance risks specific to the MITF have been identified. The monitoring control and surveillance system in place in the MITF comprises: • an integrated Computerised VMS; • a requirement to carry two observers (at least one of which must be an AFMA observer and one may be a data collection officer engaged by the industry) primarily for biological and data collection purposes, but these scientific observers also detect any instances of non-compliance with management arrangements such as closed areas, minimum size limits, bycatch limits and collection of data;		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
		• Both observers collect the same data, although the AFMA observer is the lead observer and prepares the observer reports. The AFMA observer provides instruction to the data collection officer on permit conditions, observations and supplementary instructions once on-board; The assessment team noted that the observer arrangements in the MITF exceed the CCAMLR requirements and provide for significantly enhanced monitoring activity; • in port monitoring of all unloads in Australian ports by an AFMA authorised officer to ensure compliance with catch limits; • completion of CCAMLR 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.		
	Justification	The high level of observer coverage provides a high degree of confidence that fishers comply with the management measures and this is verified through observer reports. The assessment team was advised that there have been no infringement notices, warnings issued or prosecutions in relation to operations in the MITF since the original assessment in 2012. Similarly, there have been no reports of IUU fishing during this time. To assist with detection of IUU fishing in the vicinity of Macquarie Island, aerial surveillance by New Zealand authorities on their way to the Ross Sea report the presence of fishing vessels to AFMA. The implementation of the CDS has greatly improved the detection of IUU fishing for toothfish. There is a comprehensive monitoring, control and surveillance system in place for both domestic and IUU foreign operations. The evidence available indicates that the system has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. The requirements of SG 60, SG 80 and SG 100 are met.		
b	**Guidepost**	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Y	Y	Y

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
	Justification	The FMA provides for penalties and sanctions in the event that fishers do not comply with the management measures in the fishery. The sanctions can take the form of penalty points, exclusion from fishing for a specified period, suspension or cancellation of the fishing concession, forfeiture of the vessel, net, equipment and fish on board and the proceeds of the sale of any such fish. The high level of compliance in the MIF is, in the audit team's view, indicative in part of the effective deterrence provided by the sanctions available. While there are no known infringements in relation to the MITF, there is evidence that AFMA consistently applies sanctions in other fisheries under its control. AFMA has decision matrices for offences as endorsed by the Operational Management Committee. These matrices help ensure consistency in AFMA's approach to compliance action. Sanctions to deal with non-compliance exist (SG 60 is met) and the evidence available indicates that these are consistently applied (SG 80 is met) and that they demonstrably provide effective deterrence (SG 100 is met).		
c	Guidepost	Fishers are generally thought 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.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Y	Y	Y
	Justification	Managers and industry are confident that there is good compliance with the management systems and the available evidence (such as observer reports) supports this. The industry has an excellent record of participation in the collection and submission of data and information relating to the MITF and the ecosystem in which it operates. The current Fisheries Assessment Plan (FAP) (AFMA 2016b), which is required under the MITF Management Plan, outlines the program of monitoring that will occur in the fishery during the 2016/17 and 2017/18 season. The FAP formalises how the monitoring responsibilities (tagging in particular) will be conducted and shared (or traded) between the holders of SFRs in the fishery. Operators have consistently contributed significantly to research through the provision of vessel time, an observer program, direct financial contributions and the expertise of crew. There is a high degree of confidence that fishers comply with the management system under assessment, including through collaboration with researchers and managers to provide information required for effective management of the fishery. All the requirements of SG 60, SG 80 and SG 100 are met.		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
d	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	There is no evidence of systematic non-compliance in the fishery.		
References		AFMA (2016a) http://www.afma.gov.au/wp-content/uploads/2016/08/National-Compliance-and-Enforcement-Program-2016-17.pdf , AFMA (2016b)		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				

PI 3.2.4

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	Y	Y	N
		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 research plan for the MITF is the Antarctic Fisheries Strategic Research Plan 2014/15 – 2018/19 (AFMA 2015b). The plan is developed and reviewed annually by SARAG. The plan identifies areas of high priority research and provides for research to underpin stock assessment, collection of fishery and biological data and to assess		

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
		ecological aspects of the fishery. The plan indicates that, given the current funding environment, it is possible that all projects may not be completed within the 5 year timeframe. An annual call for research applications addressing the priorities in the strategic research plan is made and applications are assessed for funding either from the AFMA Research Fund or the Fisheries Research and Development Corporation. The strategic research plan is used to develop the FAPwhich is a requirement of the MITF Management Plan and details the formal collaboration between industry and research providers. The FAP is developed every 2 years 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. The following projects relevant to the MITF are currently identified as being underway and funded under the Strategic Research Plan: • stock assessment • Development of management strategy evaluation models • Collection of fisheries and biological data; and • Ecological assessment of the fishery (monitoring by the observer program)		
	Justification	Other identified areas have not yet secured funding. The research plan provides a strategic approach to research across P1, P2 and P3. However, the assessment team cannot rule out the possibility that some of the high priority projects identified in the Research Plan may not be completed or may not be undertaken as a result of funding shortfalls. As a result, the plan meets the requirement of SG60 and 80 but only partially meets the requirements of SG100.		
b	**Guidepost**	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	Y	Y	Y
	Justification	The research plan is available on the AFMA website. Research results are provided to SARAG and South MAC and are available to stakeholders through the various consultative mechanisms described under Indicator 3.1.2. Results are published variously as papers in peer reviewed journals and/or on the AFMA website. AFMA make research results available in a timely manner. The assessment team considered that the research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available. The requirements of SG60, 80 and 100 are met.		
References		AFMA (2015b). http://www.afma.gov.au/wp-content/uploads/2014/02/6.-Five-Year-Strategic-Research-Plan-2014-5-to-2018-9-FINAL-May-2015.pdf		

PI 3.2.4	The fishery has a research plan that addresses the information needs of management	
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

PI 3.2.5

PI 3.2.5		There is a system of 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Y	Y	Y
	Justification	The performance of the fishery is subject to scrutiny by South MAC and SARAG AFMA, and other government agencies and a range of stakeholders. The South MAC assessed the effectiveness and the performance criteria of the MITF Management Plan in 2012 and it will be assessed at the next South MAC meeting as part of the 5 year requirement stipulated in the Plan. The effectiveness of measures is reviewed on an ongoing basis by AFMA and South MAC. AFMA's expenditure is also reviewed against the budget at each South MAC meeting. The management plan also requires that, each year, South MAC must conduct an assessment of the performance of the Fishery against the performance criteria contained in the Plan. This assessment is reported on in AFMA's Annual Report and is publically available on the AFMA website. The Strategic Research Plan is reviewed annually by SARAG and the data gathered are analysed and reviewed annually by the SARAG and are used in the stock assessments prepared by CSIRO. The effectiveness of the compliance activities are subject to biennial risk assessments undertaken by AFMA and appropriate changes made where required. The management plan was last amended in 2016. These amendments effectively constitute a review. The performance of the Fishery is also reviewed through annual reports by the Australian Bureau of Agricultural and Resource Economics and Sciences on the status of AFMA managed fish stocks. Taken together, the audit team considers that these mechanisms evaluate all parts of the fishery-specific management system. As a result the requirements of SG 60, SG 80 and SG 100 are met.		

PI 3.2.5		**There is a system of 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**		
b	**Guidepost**	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	Y	Y
	Justification	The MITF Management plan includes performance criteria against which the MITF must be assessed and requires that each year, South MAC assess the extent to which those performance criteria have been met in that year and AFMA include in its annual report for a financial year a statement of the extent to which those performance criteria were met. AFMA and SouthMAC (which include some external members), at least once every 5 years, assess the effectiveness of the Plan including the measures taken to achieve the objectives by reference to those performance criteria. AFMA's performance in managing fisheries, including the MITF, is also reviewed through: • annual reports by ABARES on the biological, ecological and economic status of AFMA-managed fisheries; and • five-yearly (and now ten-yearly) assessments of ecological sustainability by the Department of the Environment and Energy. Periodic audits by the Australian National Audit Office (2009) such as that done for the Domestic compliance programme further confirms that there is a wide range of review and monitoring mechanisms in place for this fishery and cover all parts of the management system. The assessment team considers that the management system is subject to regular internal and external review and the requirements of SG 60, SG 80 and SG 100 are met.		
References		Australian National Audit Office (2009) Management of Domestic Fishing Compliance https://www.anao.gov.au/work/performance-audit/management-domestic-fishing-compliance		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

1.2 Conditions

Condition 1 UoC 2 - Longline

Performance Indicator	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
Score	75
Rationale	Rationale on pg. 124. This condition is not related to a previously raised condition.
Condition	By the second surveillance audit the client shall provide evidence that all main bycatch species, including Porbeagle shark, are highly likely to be within biologically based limits. There is no evidence at present to determine that Porbeagle shark meets this criterion.
Milestones	By the first surveillance audit the client will provide update on when the stock assessment is likely to be finalised after contacting researchers. By the second surveillance audit the client provide the finalised porbeagle stock assessment and any advice from AFMA on recommended management actions, if required, to CAB.
Client action plan	1. SARAG meeting agendas will include updates on porbeagle stock assessment. 2. By the second surveillance audit the client will provide the finalised assessment to CAB. 3. SouthMAC to consider and advise AFMA on recommended management actions if required. 4. By the second surveillance audit the client will provide copy of that advice to CAB.
Consultation on condition	Industry has held conversations with AFMA management to facilitate inclusion on future agendas for SARAG and SouthMAC, issues relating to Porbeagle sharks. This has been accepted by AFMA management.

Recommendations

Recommendation 1 (2.3.2 for UoC trawl): Before trawling resumes in the fishery, a bycatch management strategy should be developed that has specific mechanisms identified to limit interactions with seabirds, seals and other ETP species.

Recommendation 2 (2.4.2 for UoC trawl): Although limited by a variety of management arrangements in practice, including a ban in operating in the Commonwealth MPA, the footprint of trawling can potentially expand significantly. The team recommends that before trawling resumes a review should be conducted on the current management arrangements. In addition, the ERA should be updated and include habitat impacts for the trawl sector.

Recommendation 3 (2.4.2 for UoC longline): Although limited by a variety of management arrangements in practice, the footprint of the longline can potentially expand significantly, including into

the Commonwealth MPA. The team recommends that a review should be conducted on the current management arrangements. In addition, the ERA should be updated and include habitat impacts for the longline sector.

Recommendation 4 (3.2.1 both UoCs): The team recommends that short-term objectives for the target stock (i.e. application of the CCAMLR control rules) should be clearly identifiable within the management system.

Appendix 2. Peer Review Reports

Peer Reviewers Overall Opinion

Overall Opinion of the Report		
	Peer Reviewer 1	**Peer Reviewer 2**
Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report? (Yes/No)	Yes	Yes
Peer Reviewer Justification	Based on my review the evidence presented in the assessment report supports the scores assigned by the assessment team. I concur with the conclusion that the fishery should be re-certified.	This is a small fishery in a politically and biologically sensitive region. It is highly monitored, regulated, and scrutinized, and the assessment team has justified in detail the conclusions made.
Certification Body Response	No response required.	
Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? (Yes/No)	Yes	Yes
Peer Reviewer Justification	The condition proposed in this re-assessment is appropriate, in the timeframe proposed, as well as the recommendations made under P2, for both the trawl and longline fisheries.	The milestones call for a stock assessment for Porbeagle shark. As the kind of assessment (from risk assessment through to population modelling) is not specified, this seems achievable.
Certification Body Response	No response required.	

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?	Yes	Yes
Peer Reviewer Justification		
Certification Body Response	No response required.	

Peer Reviewers General Comments

Peer Reviewer General Comments (optional)	
Peer Reviewer 1	**Peer Reviewer 2**
Certifying Body Response	

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 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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

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)	NA	NA
Peer Reviewer Justification		I agree that the reference points used are theoretically appropriate (limit 0.2 and target 0.5 B_0) and that the target is conservative. As the

		reference points are evaluated via long-term projection and do not explicitly take short-term fishery behaviour (e.g. fishing at greater than F_{msy}) into account, their ability to meet management objectives is difficult to discern from the description alone and seem dependent on assessment precision and the 35 year time-frame. However, the harvest strategy as a whole has been MSE tested and has been shown to meet objectives, so from that point of view I must agree that the reference points are appropriate.
Certification Body Response	No response required.	

Performance Indicator 1.1.3		
	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)	NA	NA
Peer Reviewer Justification		I agree that the reference points used are theoretically appropriate (limit 0.2 and target 0.5 B_0) and that the target is conservative. As the reference points are evaluated via long-term projection and do not explicitly take short-term fishery behaviour (e.g. fishing at greater than F_{msy}) into account, their ability to meet management objectives is difficult to discern from the

		description alone and seem dependent on assessment precision and the 35 year time-frame. However, the harvest strategy as a whole has been MSE tested and has been shown to meet objectives, so from that point of view I must agree that the reference points are appropriate.
Certification Body Response	No response required.	

Performance Indicator 1.2.1		
	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)	NA	NA
Peer Reviewer Justification		My only concern is whether the harvest strategy has been evaluated fully against the objectives in the MITF Management Plan, including for example, maximising economic efficiency in the exploitation of the resources of the fishery. Short-term objectives appear not to be explicitly considered – e.g. avoiding overfishing (usually interpreted as never fishing at above F_{msy}).
Certification Body Response	Additional information about the scope of the MSE testing that was undertaken has been obtained and referenced in the background text. Issues with the assessment that this identified have led to a revision to the rationale and the score for this PI to be reduced to 95.	

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)	Yes	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

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)	Yes	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

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	NA	NA

performance to the SG80 level? (yes/no/NA)		
Peer Reviewer Justification		
Certification Body Response	No response was required, but additional information about the scope of the MSE testing that was undertaken has been obtained in response to comments under PI 1.2.1. This work is described in the background text. Issues with the assessment that this identified have led to a revision to the rationale and the score for this PI has also been reduced to 90.	

Principle 2 Trawl – UoC 1

Performance Indicator 2.1.1		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.1.2		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.1.3		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.2.1		
	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)	NA	NA
Peer Reviewer Justification		Sleeper shark potentially a problem, but scores comprehensively justified here.
Certification Body Response	No response required.	

Performance Indicator 2.2.2		
	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)	Yes	Yes
Will the condition(s) raised	NA	NA

improve the fishery's performance to the SG80 level? (yes/no/NA)		
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.2.3		
	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	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.3.1		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.3.2		
	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	Yes	Yes

rationale used to score this indicator support the given score? (yes/no)		
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.3.3		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.4.1		
	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)	NA	NA
Peer Reviewer Justification		It may help the justification if some simple measures of % by area of habitat types affected by trawl that are protected were available. However, the Dell et al. (2016) study description gives justification

		from the % of taxa biomass protected viewpoint.
Certification Body Response	Agreed that a measure would help if it was available. No further response required.	

Performance Indicator 2.4.2		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.4.3		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.5.1		
	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	Yes	Yes

score? (yes/no)		
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.5.2		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.5.3		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Principle 2 Longline UoC 2

Performance Indicator 2.1.1		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.1.2		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.1.3		
	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	NA	NA

improve the fishery's performance to the SG80 level? (yes/no/NA)		
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.2.1		
	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)	NA	NA
Peer Reviewer Justification		I agree that there is currently insufficient evidence to determine that the Porbeagle shark population is highly likely to be within biologically based limits, and that it is feasible to gather such evidence.
Certification Body Response	No response required.	

Performance Indicator 2.2.2		
	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)	Yes	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.2.3		
	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	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.3.1		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.3.2		
	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?	NA	NA

(yes/no/NA)		
Peer Reviewer Justification		I agree that having a critically endangered Wandering Albatross population in the vicinity of a potentially threatening fishing method needs to affect the scores somewhere, and an appropriate place is the downgrading under 2.3.2b to SG80 (and for quantified consequences under 2.3.3b).
Certification Body Response	No response required.	

Performance Indicator 2.3.3		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.4.1		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.4.2		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.4.3		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.5.1		
	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)	NA	NA

Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.5.2		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 2.5.3		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Principle 3

Performance Indicator 3.1.1		
	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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

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?	NA	NA

(yes/no/NA)		
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 3.1.4		
	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 performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 3.2.1		
	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)	NA	NA
Peer Reviewer Justification		The fishery, in comparison to others, has relatively few explicit and measurable short-term objectives - particularly regarding target species exploitation.
Certification Body Response	Agree and hence this is why SG100 is only partially met. This score would be strengthened if the application of the CCMALR control rules for this fishery were explicit. A recommendation to this effect has now been included in the report.	

Performance Indicator 3.2.2		
	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)	Yes	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

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	Yes
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Performance Indicator 3.2.4		
	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 performance to the SG80 level? (yes/no/NA)	NA	NA

Peer Reviewer Justification		
Certification Body Response	No response required.	

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)	NA	NA
Peer Reviewer Justification		
Certification Body Response	No response required.	

Any Other Comments (optional)		
	Peer Reviewer 1	**Peer Reviewer 2**
Certification Body Response		

Appendix 3. Stakeholder submissions

No stakeholder submissions were received during the assessment process. MSC provided comments to the public comment draft report and these have been addresses (see below).

MSC Comments on PCDR with team responses

Page	Grade	Requirement Version	Description	Pi	Team Comments
49	Guidance	*N/A v1.3	On page 48, the principle scores for P1 for the two gear types are noted to be the same, which is concurrent with the text outlining that under P1, the same target species was asssessed covering both gear types of the two UoCs. However, on page 49, for PI 1.2.4 the scores are different for the two gear types.		The error has been corrected. The scores now match.
61	Minor	FCR-7.10.6.1 v2.0	1.1.1(a) - Per CB 2.2.1.3, a high degree of certainty means greater than or equal to the 95th percentile. Given that confidence intervals for the MCMC analysis and sensitivity test have been calculated, it would be nice to see this presented to support the rationale provided for SG100.	1.1.1	Confidence intervals to the estimates of stock status and for the projections were in the background already, but a cross-reference to these has been added to the rationale. A table showing the results of the sensitivity analyses have also been added to the background and cross-referened in the rationale to support the rationale provided.
63, 64	Major	FCR-7.10.6.1 v2.0	1.1.2(a) - In light of CB2.3.3, the provided rationale does not emphasize how the reference points have been adapted for toothfish. 1.1.2(c) - Score of SG100 given yet how precautionary issues are taken into account	1.1.2	1.1.2(a) - The adaptations were described in the background but additional text has now also been added to the rationales. 1.1.2(c) - The

			is not thoroughly elaborated on.		background text that was referenced has now also been included in the rationale.
69	Major	FCR-7.10.6.1 v2.0	1.2.2(a) -Although the 'rules' mentioned act to reduce catches if the stock approaches the target and limit reference points , it is not clear how this is ensured and specifically how the exploitation rate would be reduced. What are the rules? 1.2.2(b) - A score of SG100 was given which supports that the design of the HCRs takes into account a wide range of uncertainty. In SI (b), it was mentioned that the HCRs incorporate uncertainty in all model parameters which includes recruitment variability. However, in 1.2.2 (c) it was mentioned that "There remains significant uncertainty about some aspects of the assessment including relative levels of recruitment and movement between northern and southern parts of the stock…". Please clarify how a 'wide range of uncertainties' are being taken into account if significant uncertainty remains for some of these aspects.	1.2.2	1.2.2(a) - The rules are described fully in the background but a summary has now been added to the rationales to support the proposed score. 1.2.2(b) - The comment about uncertainty in the assessment was also followed by text which says that "but these are not sufficient to undermine confidence in the overall estimates of exploitation rates." We stand by that view. Scoring issue (b) addresses a different issue: the design of the HCR, not the achievement of required exploitation rates. The design of the HCR does take a wide range of uncertainties into account, as outlined in the rationale.

8, 48	Minor	CR-27.12.2 v1.3	Section 5.2.1 states, "Toothfish landed by the registered vessel Antarctic Discovery using longline and processed at sea and on shore, are eligible to seek and secure MSC chain of custody certification in order to sell product derived from the fishery with the MSC claim. Toothfish at MI is caught by longline." However, p8 lists UoC 1 as demersal trawl. Is product caught with demersal trawl also eligible to be sold as certified?		There is very little caught with demersal trawl and this is from research only. Further details were added to explain that fish caught by demersal tral would also be eligible.
46	Minor	CR-27.12.1.3 v1.3	The documenting of management systems in the Traceability section is robust. However, the section "An evaluation of the opportunity of substitution of certified with non-certified fish prior to and at the point of landing" is blank. This evaluation should consider, for example, given that the certified vessel is the only toothfish fishery in the area, will non-certified toothfish be landed at Nelson, Devonport and Dunedin? Pending the response to the TO raised on 27.12.2, if product caught with demersal trawl is not eligible to be sold as certified, please confirm the systems in place to ensure segregation of product caught with longline vs. trawl.		A sentence has been added to clarify that there is no risk of substitution of certified with non-certified fish.

47, 48	Guidance	CR-27.12.1.6 v1.3	Please confirm the points of landing, given the inconsistencies of the descriptions on page 47 and page 48: The toothfish is landed predominantly in Nelson, New Zealand, with occasional landings into Devonport Tasmania. A list of eligible points of landing. Toothfish gets landed at the dock in Nelson or Dunedin, New Zealand in most instances.		This has been amended in both places. It now includes an additional point of landing in Burnie, Tasmania, Australia.

Appendix 4. Surveillance Frequency

(REQUIRED FOR THE PCR ONLY)

The report shall include a rationale for determining the surveillance score.
The report shall include a completed fishery surveillance plan table using the results from assessments described in CR 27.22.1

Table A4: Fishery Surveillance Plan

Score from CR Table C3	Surveillance Category	Year 1	Year 2	Year 3	Year 4
[e.g. 2 or more]	[e.g. Normal Surveillance]	[e.g. On-site surveillance audit]	[e.g. On-site surveillance audit]	[e.g. On-site surveillance audit]	[e.g. On-site surveillance audit & re-certification site visit]

Appendix 5. Client Agreement

(REQUIRED FOR PCR)

The report shall include confirmation from the CAB that the Client has accepted the PCR. This may be a statement from the CAB, or a signature or statement from the client.
(Reference: CR: 27.19.2)

5.1 Objections Process

(REQUIRED FOR THE PCR IN ASSESSMENTS WHERE AN OBJECTION WAS RAISED AND ACCEPTED BY AN INDEPENDENT ADJUDICATOR)

The report shall include all written decisions arising from an objection.